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ORIGINAL ARTICLES.

MECHANICS OF THE PELVIS AND ITS CONTENTS.*

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The movements and the range of movement of the pelvic joints in parturition form a subject requiring farther study, and I had hoped ere this to lay some data before the Society regarding them, but the instrument I had made for dilating the pelvis broke before any satisfactory trials were made, and I have not yet procured a stronger one.

In this paper, however, I wish to take up the wider, and perhaps more generally interesting subject of pelvic mechanism in general, and will touch only briefly, if at all, on its behaviour in parturition.

For understanding the mechanics of the pelvis, the first point to be considered is the lumbar curve of the spine. In relation to this, the parts of the pelvis itself may be regarded as constantly retaining the same position to each other. Whatever movement, if any, is permitted between them, is never in normal circumstances so great as to permit a dislocation of parts. When the pelvis moves it moves as a whole.

Now, if the bony ring formed by the pelvis occupied a

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horizontal plane when the body is erect, we should say that the trunk is articulated with it at the posterior extremity of its antero-posterior diameter, while the limbs are articulated with it at the two extremities of its transverse diameter. In such a case the weight of the trunk would press in a vertical plane considerably posterior to that of the thighs, and the body would constantly tend to fall backwards. But the pelvic circle is tilted, so that the weight of the trunk comes into the same vertical plane as that of the limbs which support it. And this tilting or inclination of the pelvis is associated with the forward curvature of the lumbar spine, and in one sense may be regarded as due to that curvature. In the erect posture the curve is sharp enough to throw the pelvis into such a position that its brim, instead of being horizontal, forms an angle of about 60° to the horizon. Starting from this as the normal inclination, it is evident that if the curve flattens the brim will verge more towards the horizontal, while if it becomes sharper the brim will verge more towards the perpendicular. In other words, the anterior arch of the pelvis describes a curve passing forwards and upwards, and so approaching the sternum, or downwards and backwards, and so receding from the sternum. When the patient, for instance, is put in the lithotomy position, the distance between the pubis and the xiphoid is diminished, and when the body is extended, and a fortiori when over-extended, the distance is increased. There is thus an up and down movement of the pubis. And this up and down movement is permitted by the flexibility of the lumbar spine, and only by the lumbo-sacral joint in so far as it takes part in this flexibility. In healthy conditions variations in the curve are constantly taking place with the natural movements of the body. In sitting down, for example, the lumbar curve flattens, and the pelvis becomes more horizontal, while in rising the curve of the spine and the inclination of the pelvis are resumed.

In morbid conditions the same thing is manifest. In lumbar lordosis the pelvis inclines to the vertical, in kyphosis to the horizontal.

In pregnancy the inclination of the pelvis seems to vary a good deal with the individual. In some cases, and these are perhaps the most frequent, the pelvis is more vertical, the shoulders being thrown back to counterbalance the weight of the foetus in front of the spinal column. In other cases the pelvis is more horizontal, the shoulders being more forward, the weight of the foetus being balanced by this movement of the pelvis carrying the weight of the trunk farther back.
Pregnancy, also, by its exaggerating, brings into prominence another fact which we should note—namely, that the floor of the abdomen is not formed solely by the pelvis, but by the lower part of the anterior abdominal wall as well. The pregnant uterus, in fact, lies far more upon this than upon the pelvis, as is well illustrated in those cases in which the abdominal wall is relaxed and allows the formation of a pendulous belly. It is well known that this is most liable to form in those rachitic cases when the pelvic brim is nearly vertical, the promontory of the sacrum projecting forward, the lumbar curve sharply marked; these conditions being all merely exaggerations of what is normal in every case.

The effect of the varying position of the pelvis on the soft parts is the second point to be noted. If the pelvis occupied a horizontal plane the bladder would be behind the pubis, the uterus behind the bladder, and the rectum behind the uterus, and these organs would all press by their own weight upon the soft parts of the pelvic floor, to which they would also transmit the superincumbent weight, such as it is, of the abdominal organs resting on them. But by the tilting of the pelvis this arrangement is quite altered. The pelvic organs are thereby so disposed that the bladder rests upon the posterior or rather upper surface of the pubis, and the uterus again upon the posterior or upper surface of the bladder. The pubis, therefore, sustains the weight of the bladder and uterus. Through them, also, it sustains the weight of the superincumbent organs, which are thrown wholly upon the anterior segment of the pelvis by the projection forwards of the lumbar spine. The rectum is no longer an organ posterior to the uterus, as it would be in the horizontal position, but superior to it, overhanging it. It is held close to the sacrum by its peritoneal investment, and is thus removed from the pressure of the abdominal organs.

The clear space which is thus left between the posterior surface of the uterus and the anterior surface of the rectum, and which forms the wide upper opening of Douglas' pouch, is usually occupied by coils of intestine that float in here out of the way of pressure. But when the bladder distends with urine, it raises the uterus into this space, and so pushes out some of these intestinal coils. In the same way, when the upper part of the rectum is distended, it pushes down into this space, and also leaves less room for the coils of intestine.

The behaviour of the uterus during the filling and emptying of the bladder should be specially noted. When the bladder is greatly distended, occupying the hypogastrium, and reaching
up towards the sacrum, the uterus, which looks like a small appendage to the large bladder, is held in apposition to its posterior surface by the round ligaments attached to the angles of the uterus, and by the sacro-uterine ligaments attached about the level of the isthmus uteri. As the bladder empties, the uterus still held in apposition to its posterior surface may assume one of two situations with regard to it. On the one hand, if the bladder takes what has been called its systolic form, and contracts so as to form a firm thick-walled viscus, the uterus lies merely in apposition to its posterior, or rather superior surface. On the other hand, if, as is more usual, and as occurs at a later stage even in the systolic condition, the bladder wall is relaxed; the uterus sinks down upon it so as to lie in a concavity on its superior surface, fitting into the concavity presented by the base of the bladder. The pressure of the uterus in this case will naturally aid in the emptying of the bladder, which some suppose is mostly performed, not so much by the action of the bladder wall itself, as by the pressure of organs around it.

The effect of the filling and emptying of the rectum is not so evident, and is probably not so simple as in the case of the bladder. To study this effect we must regard the rectum as divided into an upper and a lower portion by the sphincter tertius, the place of division lying about the level of the os tinae. When the lower portion is distended, the effect is to thicken the lower layers of the pelvic floor and to elevate the uterus, while a distension of the part above this, if large enough to bring the rectum into apposition with the uterus, will press the uterus against the bladder, and so indirectly compress the bladder itself. Probably the chief result of the chronic distension of the rectum, which is so common in women, is to stretch and slacken the sacro-uterine ligaments, and so to facilitate the accidents to which such relaxation leads.

The most interesting part of our subject, however, is the consideration of the intra-abdominal pressure. For simplicity's sake, I have as yet spoken merely of the weight of abdominal organs, without reference to the pressure within the abdomen. And the two things should be kept perfectly distinct in our minds. Even in the thorax, where we are accustomed to speak of intra-thoracic pressure alone, there are many phenomena that indicate the importance of weight as well. Hypostatic congestions, such as are so frequent, can occur only because gravity continues to act independently of intra-thoracic pressure. In the same way there is a constant tendency for the abdominal organs to descend by their own weight towards
the lower part of the cavity. This tendency is subject to restraint of various kinds. The connections and ligaments of the various solid organs are firm enough in normal circumstances to maintain them at an almost uniform level. The mesentery of the bowel, and sometimes even the gas contained in it, raise it mostly above the pelvis. In this way the sum of weight pressing on the pelvis is, on the whole, very light. In the absence of effort this weight, slight as it is, is probably of more importance than even intra-abdominal pressure. When, however, the intra-abdominal pressure is increased by effort, and especially by very powerful effort, the proportion of weight-pressure on the pelvis to that of the intra-abdominal pressure is so slight that it may be disregarded in our consideration.

What, then, is the effect of intra-abdominal pressure? The first result is the equalisation of the pressure throughout the abdomen, each part pressing on its neighbouring parts with the same force as every other part. As the result of this equal pressure there is a fixation of organs—a cessation of movement for the time being. These two results are all that follow in normal circumstances. But when there is any abnormality—an undue excess of pressure on the one hand, or an undue weakness of the abdominal wall on the other—the wall bounding the abdomen must give way at the weakest part. Hence arise the various herniae of the abdomen.

In the pelvis the effect of the intra-abdominal pressure is to fix the organs in the position they occupied at the commencement of the effort, and to consolidate, as it were, the pelvic floor. And here it is important that we separate the ideas of weight and pressure from each other, for the weight, as we have seen, presses on the posterior wall of the pubis, while the intra-abdominal pressure affects the whole pelvis equally. It is this equalisation of pressure which leads to the emptying of the bladder and rectum when the sphincters of these organs are relaxed, and which, when the pressure is excessive, sometimes induces their involuntary emptying by overcoming the contraction of the sphincters.

So long as the pelvic floor is intact these are all the effects produced by intra-abdominal pressure, but when there is any weakening, and still more when there is actual defect in the floor, the effects may come to be of the most various and important kinds.

Usually, such weakening and defect are the result of parturition, and consist in a relaxation of the tissues, and often in an absence, more or less complete, of the perineal body.
The relaxation of the pelvic floor, which so frequently persists after childbirth, should be regarded as a subinvolution—an imperfect return to the normal of tissues which have been changed during pregnancy. Though this term is usually applied only to the uterus, it is equally applicable to all the other structures that are affected by pregnancy. It is in the abdominal wall and in the pelvic floor that this condition of subinvolution is specially noticeable. The relaxed and flabby abdomen of the multipara, no less than the open vulva and the relaxed vaginal walls, indicates an absence of that return to normal conditions that should take place after parturition.

It is to subinvolution of the pelvic floor, with or even without subinvolution of the uterus itself, that many of the pelvic troubles of women are due. The sacro-uterine and the round ligaments, which are those that have the chief influence on uterine position, share in the subinvolution, and are elongated and relaxed. They are no longer rendered tense when the bladder distends and thrusts the uterus towards the sacrum. They fail, therefore, to maintain the uterus in apposition to the bladder wall, and when the bladder is fully distended, and any effort is made, the intra-abdominal pressure catches the anterior instead of the posterior surface of the uterus. The uterine supports are therefore strained still more, and by frequent repetition of this act their function comes at length to be altogether destroyed. So long as the bladder is not permitted to be over-full, the pressure will constantly fall on the posterior uterine surface, and of itself ensure the apposition of the uterus and bladder, and the prevention of retroversion. But the very frequency of this displacement is related to the frequency of the habit of long retention of urine among women.

Subinvolution of the anterior abdominal wall, again, has the effect of lessening the tension within the abdomen, the muscles of this wall being the chief agents, along with the diaphragm, in producing increase of the intra-abdominal pressure. This diminution of tension is no doubt associated in some degree with the constipation which is so common among females, as well as with the long-continued retention of urine. Its result on the contained abdominal organs must be to allow them to be fuller of blood than in ordinary circumstances. This condition is perhaps most commonly seen in the uterus, which is maintained in its subinvolutioned and enlarged condition, not only by the state of its own parenchyma, but by the chronic congestion permitted by the laxity of the abdominal boundaries. The laxity of the uterine supports is sometimes shown
by movements of the uterus being rendered perceptible to the woman herself as she moves about owing to the increased size of the organ.

The results of a defect in the pelvic floor are of a different kind from those of subinvolution. Suppose an opening be made anywhere in the pelvic floor or, indeed, anywhere in the abdominal wall, the effect of the intra-abdominal pressure will be to push into it the neighbouring parts until the opening is filled up and the pressure over the whole floor is equalised. It is evident that in this filling up of a defect the neighbouring parts that are the most displaceable will take the largest share. This is true wherever, and of whatever kind, the defect may be. The common defect, of which we see illustrations every day, is the laceration of the perineum. The effect of this laceration on the pelvic floor forms a most interesting study. To understand it we must recollect that the uterus and bladder lie upon the pubis, while the rectum is connected with the sacrum. There is thus a natural division of the pelvic floor into an anterior and a posterior part, almost corresponding to what are known in obstetrics as the displaceable and the fixed portions. We may regard the pouch of Douglas as marking the separation between these two parts above, while the lumen of the vagina marks it below. These two parts come into apposition, and therefore mutually press upon each other about the level of the os tincæ, the point of apposition, however, varying with the fulness of the rectum, and also, perhaps, slightly with the fulness of the bladder. Below this point the pelvic floor is normally an unbroken mass of tissue, the effect of the intra-abdominal pressure upon which is to increase the force with which the parts press on each other, but in no way to cause any displacement of parts. When, however, the perineal body, which is the anterior extremity of the sacral segment of the floor, is lacerated, the anterior or pelvic segment is left without its normal support, and the effect of the intra-abdominal pressure upon it is to press it into the vacant space. This first result is conveniently described as a prolapse of the anterior vaginal wall, but in using this name it must be remembered that the anterior vaginal prolapse implies a downward movement of the whole anterior segment of the pelvic floor. It happens, however, that the space left vacant by the absence of perineal support cannot be filled by the descent of the anterior segment. The attachment of this to the firm subpubic structures prevents it from spreading backward into the place of defect, but causes it to spring forward, describing a curve which brings the parts
of the vagina from below upwards successively into view. In this way, while more and more of the anterior segment descends, it meets with no resistance below to its descent, and were there no resistance within the pelvis there would be no limit to the possibility of prolapse. And this is the case in too many instances. The descent of the anterior segment of the floor goes on ever increasing until urethra and bladder, uterus and vagina, and sometimes even the lower part of the rectum present together a huge tumour between the patient's thighs. This is the natural course in the absence of internal resistance; but there are, fortunately, many cases where this course is not followed, and where we must look for some internal obstacle to descent. This obstacle I consider to be formed chiefly by the sacro-uterine ligaments. No doubt the other uterine supports—the ligamenta lata and rotunda—have some effect when the descent is sufficient to put them upon the strain, but if the utero-sacral ligaments have failed in saving them from strain, there will be little hope of preventing complete prolapse. We are not to suppose that the sacro-uterine ligaments act by withstanding by their own force all the effort of intra-abdominal pressure. That would be impossible. Their action in preventing prolapse is indirect, and is merely a continuance of their ordinary action in maintaining the uterus in its normal anteflexed position. When the uterus is in this position, the surface of the anterior segment presented to the intra-abdominal pressure is of the smallest possible extent, and the amount of pressure on that segment is therefore the smallest possible. But when the utero-sacral ligaments fail to act and allow the uterus to become retroverted, the state of matters is quite changed. The anterior segment of the floor is then split up into two parts which, together, cover all the pelvic floor, and therefore receive the whole pelvic proportion of the intra-abdominal pressure. Further than that, the uterus, instead of lying upon the vagina through the medium of the bladder, and so closing the vaginal lumen, now lies in the line of that lumen, and by its wedge-shape constantly tends to open up the vagina and press into the space thus obtained.

When the parts are arranged in this way they are in the position most favourable for the development of prolapse. So long as the uterus is antevorted, prolapse of the vaginal walls takes place, the anterior pelvic segment descends, but a prolapse involving the uterus is one of the very rarest of occurrences. But whenever the uterus becomes retroverted—retroversion itself involving some amount of descent
—prolapse of the uterus becomes easy. It is, indeed, a necessary result if the woman belongs to the labouring class, and has to use any great amount of exertion.

The downward progress of such a case is greatly assisted by the mechanical action of the bladder. This organ is carried down with the descent of the anterior pelvic segment, until its base comes to be covered, merely by the anterior vaginal wall. The importance of this is easily understood. In normal conditions, when the bladder distends, the base takes a very small share in the distension. Distension is mostly permitted by the upper wall of the bladder stretching from the urethra in front to the attachment to the uterus behind. The loose attachment of this upper wall of the bladder to the peritoneum permits of its distension without any stretching of that serous membrane. But the base is attached by cellular tissue to the vagina and uterus, and is prevented from distending not only by that attachment, but also by the resistance of all the adjoining parts of the pelvic floor. When this resistance is removed there is no external obstacle to the distension of the bladder downwards, and the internal pressure within the bladder tends to distend its base equally with its fundus. This tendency, in many cases, finally succeeds in overcoming the resistance presented by the thicker tissues of the base, and we have a cystocele appearing on the lower surface of the anterior pelvic segment. The formation of a cystocele aids still farther in increasing the openness of the vulva, besides leading to bladder troubles of various kinds.

In considering the subject of intra-abdominal pressure, I have spoken as if there was no doubt about the existence normally of such a pressure. But it must not be forgotten that another theory of abdominal and pelvic mechanisms has been advanced—chiefly by the late Dr. Matthews Duncan. According to this theory there is a negative pressure within the abdomen which develops what has been termed the retentive power of the abdomen. Sometimes there is a sudden and great increase of this retentive power, constituting “aspiration,” similar to inspiration in breathing. By this aspiration are explained, for example, cases of impregnation without penetration, the aspiratory force sucking the semen through the vagina into the interior of the uterus. It is supposed that even in ordinary cases this force may act in drawing the semen into the uterus and tubes. Cases are adduced in which a catheter has been introduced into a full bladder, or a trochar into a pelvic collection of fluid, without
the fluid escaping until external pressure was applied, and these are supposed to be examples of excessively developed retentive power. This retentive power is also given as an explanation of cases of retention of mucus in the folds of the vagina, and of others in which foreign matters, such as hairs, have been found in the vaginal fornices. The same explanation is given of cases in which cervical mucus collects in the body of the uterus. The retention of the ovum in the uterus and the ascent of the pregnant uterus into the abdomen are also illustrations of the same force. It is by a diminution of this retentive force again that prolapse of the uterus occurs, and a method of curing this condition by an increase of the retentive power—by aspiration, in fact—has been suggested as a possible future discovery.

This theory of a force "which draws inwards into the cavity of the belly," seems to me to be based on a misunderstanding of the phenomena of intra-abdominal pressure. There is and can be no such indrawing force. The result of a negative pressure within the abdomen could only be that the atmospheric pressure without would push inwards all the abdominal walls until the pressure without and within the abdomen was equalised, and instead of negative pressure we should have positive pressure instituted.

But if the theory of negative pressure is wrong, how are we to explain the facts for which it has been devised as an explanation? Take, for example, the ascent of the uterus in pregnancy (Researches in Obstetrics, p. 416)—"The uterus in a state of vacuity is found entirely confined in the excavation; under the influence of pregnancy it increases in weight and volume, and, nevertheless, it rises in spite of the pressure of the intestines, the action of the diaphragm, the resistance of the fibrous and muscular elements of the abdominal wall. To it there is nothing but resistance in this direction. It rises more and more according as its volume increases, as its weight becomes greater—that is, as the resistance becomes more energetic, it rises in spite of the laws of gravity, repels the intestinal mass, the diaphragm, mechanically distends the abdominal wall, and at last is found situated above the superior strait." "This ascent," says Dr. Matthews Duncan, "forms, I believe, an illustration of the physiological or natural use of the retentive power;" and he adds, "As the uterus enlarges in early pregnancy, sometimes also as it enlarges in disease, the base of the thorax of the female is expanded, the capacity of the abdominal cavity is increased, and the uterus, instead of
forcing its way up against the influence of gravitation, is
probably actively drawn up, at least to some extent, into
its new site." Further, as if he wished to carry his theory
to its furthest limits, to what, in fact, seems a *reductio ad
absurdum*, he says again, "In some cases this drawing up
is abnormal or extraordinary in force, and the uterus is then
entirely sustained by the drawing up forces, being removed
from solid subjacent support."

For the true explanation of the ascent of the uterus in
pregnancy, however, it is not necessary to resort to any
mystic force such as this of aspiration. In fact, the term
ascent is hardly a proper one as applied to the pregnant
uterus. The uterus does not ascend—it merely grows. The
cervix remains at its ordinary level, and connected with its
ordinary attachments. And, as the uterus grows, it presses
upward, because the intra-abdominal pressure, against which
it expands in that direction, is less than the pressure of the
pelvic floor, against which it pushes in the other direction.
Were the opposition above greater than the resistance below,
it would not expand upwards. And this fact we have illus-
trated in the occurrence of retroflexion of the gravid uterus,
where the sacrum offers an effectual obstacle to the rise of
the uteri fundus, and the uterus expands till it fills the
pelvic cavity below.

In the distension of pregnancy the uterus follows the
same mechanical law as the bladder does in filling with
urine, and as the rectum does in filling with faeces. As it
fills its fundus is carried upwards, because the sphincter at
its lower extremity refuses to yield and permit of the escape
of the contents in the other direction. The change in the
uterus in pregnancy is, of course, very far from being wholly
explicable by mechanical law, but so far as mechanical law
enters into its explanation, the upward growth is due to the
pressure below being greater than that above. The retention
of urine in a bladder, whose walls are weakened by over-
distension or from any other cause, is due in the same way
to the forces closing the urethra being greater than, or at
least equal to, the pressure upon the walls of the bladder.
The forces closing such an outlet as the urethra or cervix
are two in number—one the mutual pressure, which we
have already mentioned, as equal throughout the abdominal
walls; the other, the action of the sphincter muscle. In the
case of the cervix, which is a very long and a very powerful
sphincter, the mechanical action of this muscle is very great,
and it is only when its resistance is overcome that the con-
tents of the uterus can escape. When we speak of overcoming the resistance of the sphincter, however, we must not forget that it is a vital mechanism, and that many other causes besides mechanical force can overcome its resistance. In ordinary mensturation, e.g., the menses escape without difficulty, because, while the walls of the body of the uterus do not yield to the fluid pressure between them, the cervix, the muscular tension of which is then relaxed, does so yield. When this natural condition does not exist, and the walls of the body yield more than those of the cervix, a spasm of the muscle of the body is excited so as to overcome, under painful pressure, the resistance of the cervix. There is, in fact, as has been said, a condition of polarity in these organs—action at the sphincter and inhibition at the fundus, alternating with inhibition at the sphincter and action at the fundus. Thus, in pregnancy, the body of the uterus is in a state of inhibition, the cervix in a state of action; while, in parturition, the body becomes active and the cervix is inhibited.

We must now take another series of facts on which stress has been laid. If you empty an over-distended bladder through a catheter by using very firm pressure over the abdomen, and then suddenly withdraw that pressure while leaving the catheter in, air may be drawn into the bladder through the catheter. Again, if you empty a relaxed and distended uterus by pressure on the fundus, and then suddenly take away the pressure while the cervix is held open, air may rush through the cervix into the interior of the uterus. And again, when using Sims' speculum, air rushes into the vagina and distends the vault. These are supposed to be examples proving the retentive and aspiratory power of the abdomen. But they are much more easily explained in another way.

In the simplest case—e.g., that of the expansion of the vagina when the Sims speculum is used in the semi-prone or genu-pectoral position—the ingress of air to the vaginal vault is not due to any diminution of pressure within the abdomen, but to a change of position in the abdominal contents. The direction of the weight-pressure of the abdominal organs is changed, but there is no change in the intra-abdominal pressure. In proportion as the pelvis bulges less, the intra-abdominal wall bulges more.

The entrance of air into bladder and uterus on sudden removal of excessive pressure is due to the sudden disturbance of stability, in the restoration of which the open passage permits the atmospheric pressure as well as the intra-abdominal pressure to take a share. The intra-abdominal pressure in its
least degree—i.e., apart from any muscular effort which increases it, is in reality the atmospheric pressure transmitted through the abdominal walls. If any part of these walls be opened so as to form a free passage, air must necessarily enter by it until it meets with the opposition of a pressure equal to or greater than its own.

Cases, however, such as Dr. M. Duncan mentions, where, e.g., urine did not flow through a catheter introduced into the bladder until pressure was applied externally, are only to be explained as errors of observation. Either the catheter was stopped by some material which the pressure of the urine was not sufficient to sweep away, or the outer end of the catheter was at a higher level than the bladder, so that the urine did not reach it by hydrostatic pressure, while the contractility of the bladder wall was absent at the time.

Before leaving the subject of intra-abdominal pressure, we ought perhaps briefly to look to its influence on the circulation. Matthews Duncan naturally considered that the abdomen had some power of suction on account of its aspiratory force; but, as we reject his theory, we must also reject this opinion. The circulation in the abdomen and its walls is subjected ordinarily to the pressure of the atmosphere like the circulation in other parts of the body. When the intra-abdominal pressure is increased, the passage of blood from the lower limbs into the abdomen is necessarily impeded, as is familiar to us all in pregnancy. Within the pelvis the circulation is subject not only to the intra-abdominal pressure which facilitates it, but to the superincumbent weight of the organs lying on the pelvic floor which so far impedes it. If there is an over-fullness in the abdominal vessels, whatever its cause may be, it is naturally manifested first in the venous plexuses of the pelvis, as we see so frequently in hemorrhoids, varicosities of the vulva, menorrhagia, &c. This over-fullness of the pelvic vessels often connects itself, as might be expected, with the great dilatation of the vessels that takes place during pregnancy—a subinvolution of these vessels being perhaps frequently a cause of subinvolution of the uterus itself. Before passing from this we might note that in such cases the natural mode of relieving the condition is by reversing the direction of abdominal weight-pressure—i.e., by frequently requiring the patient to lie with hips raised above the level of the shoulders. Indeed, Aveling advances the opinion that much of the pelvic congestion that is so common now-a-days may be traced to women seldom if ever adopting the attitude of devotion!
In conclusion, I wish merely to refer to pelvic communicated movements—i.e., the movements which occur in the pelvis as a result of movements in other parts of the body. It may almost be said that there is no movement of the body, however slight, which does not communicate itself to the pelvic organs. In speaking, e.g., there is not only a pectoral fremitus, but an abdominal and even a pelvic fremitus. Respiration movements of the pelvic floor can be traced, and are indeed visible to the eye. Walking and especially running cause considerable vibrations, which are naturally most developed in the upper part of the uterus, where it is free from connective-tissue attachments. This part of the uterus, indeed, though forming part of the pelvic floor so far as intra-abdominal pressure is concerned, ought, from many points of view, to be regarded as a separate organ lying on the pelvic floor. It is because of this fact that it is liable to be dislocated backwards. Some of the rare cases in which retroversion occurs suddenly, even in nulliparae from a jump or fall from a height, are to be explained by the sudden shock lacerating the contractile fibres in the sacro-uterine ligaments, and throwing the uterus backwards from its normal relation to the bladder. This, of course, will be still more liable to occur if the bladder is overfull at the time.

The importance of these pelvic communicated movements becomes very evident in cases where there is a tendency to prolapsus. The vibrations and shocks to which the pelvic floor is normally subject are then intensified by the relaxation and want of mutual support in the tissues, and in many cases also by the increased weight of the subinvolved uterus. A vicious circle becomes established, the relaxation of the tissues increasing the movements, the movements again increasing the relaxation, and the progress of the prolapse is accelerated.

THE EXAMINATION OF THE EYE.

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(Continued from p. 275, vol. xxxiv.)

THE ESTIMATION OF AMETROPIA.

In a previous paper we have given a description of the methods we employ for estimating hypermetropia both by
the shadow test and by direct measurement with the refraction ophthalmoscope. In using the latter method the great point is to focus accurately the smaller vessels of the fundus, not the large trunks, and it is necessary for the observer to make allowance for any error of his refraction. There are several matters of detail which are only of secondary importance, but still of great practical utility, which we leave over, and discuss at present the testing by trial glasses. To our mind no examination is at all complete without this test, yet our own experience of a very large number of cases convinces us that it is the least reliable of any method, especially as regards the examination of hypermetropia. For example, take this case as illustrative of what happens in many cases. A lad, aged 20, who is employed at fine work, is brought to the clinic. On testing his visual acuteness it is found that for his right eye he has only \( \frac{20}{105} \), and for the left \( \frac{29}{30} \), but that he reads the smallest of the near at hand types with comfort. He is supposed to be short-sighted, and these facts would seem to indicate that he is; yet, after all, it is but a pseudo-myopia depending on spasm of the muscles of accommodation; the patient is in reality hypermetropic. In the same way existing astigmatism is often masked by a spasm of the ciliary muscle, and at other times there is a manifest astigmatism which does not really exist. There is no test absolutely reliable unless the patient's eyes are under a mydriatic, and of all the methods of testing young hypermetropes, probably the least reliable is that by trial glasses. After a certain period of life the power of accommodation begins to decrease, and then this test can be more relied upon. After the age of 45 we very seldom trouble testing the refraction in any other way than by trial lenses. The method is very simple. The patient is placed at 20 feet from a set of Snellen's or Monoyer's distance types, and one eye is examined at a time. The other should be excluded from the act of vision. This is best done by placing a trial frame on the patient's face and putting a piece of opaque glass into one side, while into the other the convex glasses are fitted one after the other. In the practice of certain surgeons we have seen the one eye excluded by the patient keeping it closed by the fingers of one hand whilst the surgeon passed the trial glasses before the other eye. All pressure on one eye is apt to excite an act of accommodation in the other, and hence, if the one eye is thus closed there is very apt to be a wrong result obtained for the other. When the patient's hand is used to prevent an eye seeing, then the palm of the hand should be held in front of, although close to that eye.
The patient thus being placed at 20 feet from the types, with one eye excluded, is asked to read them. Two cases are possible—he may either read the whole of them, or he may not. If he does, but does not when a weak convex glass is put before the eye, there is no manifest hypermetropia. The examiner, however, must be on his guard. We have already pointed out that a hypermetropia may be so masked by the accommodation as to resemble a myopia. We need not, therefore, be surprised to find that the accommodation may overcome the hypermetropia just to the point of making the person appear emmetropic. In such a case the hypermetropia is said to be latent, as distinguished from manifest. Therefore, the fact that a person can see all the test letters is not a proof that there is no hypermetropia. Further, it does not preclude the possibility of a weak degree of astigmatism.

If, then, a patient can read all the types, a convex glass of say 0·5 D is put in front of the eye; if he still can read them—i.e., if the lens does not make the letters appear less distinct, then he has at least 0·5 D of hypermetropia. The examination must not stop here, but the other numbers of the series, beginning with the lower and going up to the higher, must be tried, till at last a glass is found which causes the distant types to be less distinctly seen. The glass immediately below this expresses the manifest hypermetropia. Thus, if the glass which first blurs the object is + 3 D, we infer that there is 2·75 D of hypermetropia manifest. From these considerations the student will at once understand the rule that—The strongest glass with which the patient has maximum vision for distance expresses the amount of manifest hypermetropia.

If the patient cannot read all the letters, then the following possibilities must be taken into consideration:—(a) There may be some pathological condition preventing normal sight—e.g., cataract, optic nerve atrophy, disease of the retina; (b) or the patient may in reality be myopic; (c) or, lastly, there may be hypermetropia simply or in combination with some pathological condition, or with some spasm of the ciliary muscle. Those cases in which there is spasm to such an extent as to make the patient appear short-sighted will not likely become manifestly hypermetropic till the eye is put thoroughly under a mydriatic, and when the examiner has any doubt in his own mind as to the real condition, he should not hesitate to use atropine or duboisine. Apart from such cases, if a convex glass either improves the sight for distance or makes it no worse, provided there is a fair amount of vision, then the examiner may feel confident that he is dealing with
hypermetropia; and, as before, the strongest convex glass which gives to a patient his maximum of vision is the measure of his manifest hypermetropia.

Turning now to the tests for myopia, there are three which we generally employ in our work—namely, the shadow test, measurement by a refraction ophthalmoscope, and the test by trial glasses. There is a fourth which we very often employ, and which, therefore, we will describe at some length—i.e., estimation by the indirect method. Let us again say that in myopia the antero-posterior axis of the eye is too long. Hence, rays coming from the retina come from a distance greater than its posterior focal length, and therefore, after passing through the cornea, converge. If the patient’s accommodation is absolutely in abeyance they converge to the far point of the eye; if it is not, then to a nearer point. In the majority of cases it may be said that they converge to the far point. On this fact a rough approximation of the amount of myopia may be obtained by asking the patient to look at some minute objects—say, for example, a set of medium-sized types. These the patient can see at his remote point, for the rays diverging from the object held at that point to the cornea must be focussed at the conjugate of that point—namely, the retina. If the types are held beyond that point, then the image is formed in front of the retina, and the vision becomes indistinct. This method, however, is liable to so many errors that it is of little or no use for estimating myopia with any degree of precision. It must be remembered that a myopic eye is very often an unhealthy one, and therefore one with a low visual acuteness. Hence, the patient is apt to bring any object at which he may be looking closer to his eye, so that the image falling on the retina may be increased in size, and a greater stimulation of the retina ensue.

When the shadow test is employed, the observer places himself at about 4 feet from his patient, with the light arranged as in testing hypermetropia. He throws a beam of light into the eye and rotates his mirror in all directions. The result which he observes will depend upon whether the mirror be a concave one or plane. With a concave mirror the light will move in the eye in the same direction as that in which he moves the mirror. As already pointed out, however, if the myopia be very low, then the movement may be in the opposite direction. With myopia of 1 D and over, the movement is in the same direction. Concave glasses are then put into a trial frame in front of the eye. We begin with the lower numbers of the series and go on to the higher, until one
is got which turns the shadow—i.e., makes the light in the eye, which has till now been moving in the same direction as the rotation of the mirror, move in the opposite direction. This glass is approximately the one which corrects the error of refraction. It is, as a rule, about 1 D or so too weak.

The measurement with the refraction ophthalmoscope is conducted on precisely the same lines as that for measuring hypermetropia. Let us suppose that the examiner is emmetropic. If he looks into a myopic eye with his ophthalmoscope without any glass behind it, he will not be able to bring anything into an accurate focus. If, however, he rotates in behind the mirror the series of concave glasses with which his ophthalmoscope is provided, beginning with the weakest, he will find a glass with which he sees the details of the fundus clearly. That glass is approximately the measurement of the myopia.

The explanation of this method is briefly as follows:—A concave glass always tends to cause rays of light to diverge. The rays of light, as they leave the patient’s cornea, converge, as we have already seen, to his far point. If, therefore, concave glasses are rotated in behind the ophthalmoscope, those converging rays of light from the patient’s eye which pass through the little opening at the centre of the mirror will encounter a diverging lens. These rays, therefore, will be made less converging by the diverging power of the concave lens behind the ophthalmoscope. When the divergence of the lens is exactly equal to the convergence of the rays, then the rays are rendered parallel, and as the examiner is in our case supposed to be emmetropic, his eye is adapted for parallel rays, therefore the rays coming from the patient’s retina are focussed on the surgeon’s. Hence, the two retinas are foci conjugate to each other, and the surgeon sees his patient’s fundus.

Let us now suppose that the concave lens behind the ophthalmoscope is somewhat too strong. In this case the convergence of the rays from the patient’s cornea will not only be corrected into parallelism—it will be over-corrected; and the rays, on emerging from the lens, will diverge. This slight divergence the surgeon may be able to overcome by his own accommodation, and thus get a clear picture of his patient’s fundus. Hence, two conditions are necessary for the measurement of myopia by the indirect method:—(1) The surgeon’s accommodation should be relaxed; (2) the weakest glass with which he sees the fundus is approximately the measure of the myopia. In using the refraction ophthalmoscope to measure myopia, care ought to be taken to keep the
ophthalmoscope as nearly as possible at the same distance from the eye undergoing examination, as glasses are worn—i.e., about half an inch. Also, the surgeon should endeavour to look as directly through the ophthalmoscope as possible, and not obliquely through it. These rules are of special importance in the higher degrees of myopia, and if neglected may lead to serious error.*

The test by trial lenses is conducted in a precisely similar way to that of hypermetropia. The patient is placed at 20 feet from the test types, and is desired to read them, one eye being excluded from the act of vision. If the myopia is at all strong, say over 6 D, he may not be able to see any of them, but as the concave glasses (beginning with the lower number of the series) are one after the other held in front of the eye, the vision gradually improves until a glass is reached which gives the patient the maximum of vision for that eye. One precaution, however, is necessary when deciding which glass is the measure of the myopia. Suppose several glasses, let us say, 8 D, 9 D, and 10 D, give the patient equally good sight for distance, which is the glass that we should take as the measure of the myopia? The rays of light are coming from the test types 20 feet away. They are, therefore, practically parallel to each other. What is wanted is that they should be caused to diverge by a concave glass to such an extent as to make them enter the patient’s eye as if coming from his far point. Manifestly, the glass which does that is the weakest of the three—i.e., 8 D. Therefore, this glass is the measure

* In the above examples we have supposed that the observer is emmetropic. As few examiners are, however, we think it right to make the following observations:—If both surgeon and patient are hypermetropic, let the surgeon find the strongest glass with which he is able to see his patient’s fundus. Let him deduct from that the amount of his own hypermetropia, and the remainder is the amount of his patient’s hypermetropia. Thus, if the strongest glass with which the patient’s eye is seen is + 5 D, and the surgeon knows that his own hypermetropia is 2 D, then the patient has H = 3 D.

Again, if the patient is myopic and the surgeon hypermetropic, we must remember that the one form of ametropia tends to correct the other. Thus, if a surgeon has H = 3 D, and when his accommodation is at rest, he sees the details of the fundus with + 1 D, he knows that his patient has about 2 D of myopia. If the weakest concave with which he sees it is 3 D, he knows that the myopia is 6 D, and so on.

Again, suppose the surgeon is myopic, let us say to 5 D, then if the weakest concave with which he sees the patient’s eye is 8 D, he knows that the patient’s myopia is 3 D. In this case the lens behind the ophthalmoscope is the sum of his own and his patient’s myopia. If, however, the weakest glass with which he sees it is concave 2 D, then he infers that the eye which he is observing has about 3 D of hypermetropia.
of the myopia. The other two cause a slightly greater divergence than the actual amount required, which extra divergence the patient is able to overcome with his own accommodation, and so get distinct vision. Here, again, the distance at which the lenses are held from the eye is a matter of considerable importance in the higher degrees of myopia.

We have mentioned that there is a very convenient method of measuring myopia by the indirect examination with the ophthalmoscope. We have as yet said little about ophthalmoscopic examinations, and we may, therefore, in this place give some account of the way in which they should be made. The methods are two in number—viz., (1) The Direct, (2) The Indirect. In the first, the arrangement is that the retina of the patient and of the surgeon are made foci conjugate to each other, and thus the observer sees the patient's eye directly.

![Image of ophthalmoscope setup]

Fig. 13.

In the second, the rays of light coming from the patient's eye are brought to a focus in front of it, and an image of the fundus is formed between the surgeon and the person undergoing examination. It is this image which is observed. A reference to diagrams 13 and 14 will make the matter clear.

In Fig. 13 a beam of light is thrown into an emmetropic eye by the mirror m. The fundus is thus illuminated, and every point thus illuminated reflects light towards the cornea. The light, as it leaves the eye, may be regarded as composed of a large number of pencils of parallel rays, for the eye is emmetropic. If the mirror be at a very short distance from the eye, then we may suppose that a pencil passes through the aperture a of the mirror; and if the observer is emmetropic, it will be focussed very easily on his retina. If, however, the eye which is being examined is hypermetropic, the pencils of light will consist of divergent rays, and the one passing
through the aperture must be made parallel by means of one of the convex lenses behind the mirror if it is to be brought to a focus on the surgeon's retina, unless he use his own accommodation. If, on the other hand, the patient's eye be myopic, the pencil passing through the aperture is composed of converging rays. These must be made parallel before they are focussed on the emmetropic retina of the examiner.

Such is the Direct method of examination. The Indirect method is best studied in a highly myopic eye, for then an image of the fundus is found at a tolerably short distance in front of the eye. If an eye is not myopic, then an inverted image of the fundus may be obtained by holding in front of the eye a strong convex glass, say of from 10 to 15 D. Where the myopia is low, then a weaker convex lens will suffice than in emmetropia, and in emmetropia a weaker than in hypermetropia. In weak myopia we generally use a glass of about 8 D, in emmetropia a glass of about 10 D, and in hypermetropia a somewhat stronger one. In myopia of 10 D

![Fig. 14.](image)

and upwards no glass is required, as will be evident on considering the following paragraph. These glasses are held by the surgeon close in front of the patient's eye, while he sits about 18 inches or 2 feet from the patient, illuminating the eye with his ophthalmoscope held close to his own face.

Fig. 14 gives a rough idea of the course rays take after leaving a myopic eye. Here it is convenient to trace the course of two rays of two pencils. We see, then, that an inverted picture of the retina is formed in front of the patient's eye. It occupies, in short, his far point of distinct vision. The greater the myopia the nearer will this image be to the eye. In a myopia of 5 D it will be at about 8 inches, in myopia of 10 D at 4 inches, and so on, according to the table already given. Now, if we know the distance between the observer's eye and this image, we may be able to estimate the myopia. Let the examiner again be emmetropic, and let him place behind the mirror of his ophthalmoscope a convex glass of 4 D = 10 inches. With such an arrangement, and
with his accommodation perfectly in abeyance, he can see objects at 10 inches. He cannot see them farther away, because the rays of light would enter his eye converging, and would be brought to a focus in front of his retina. Nor so long as his accommodation is absolutely nil can he see them nearer. If, then, with such an arrangement he can see this inverted image at a certain distance from the patient, but not at a farther distance, let the distance between the surgeon's and the patient's eyes be noted. Suppose it is found to be 18 inches, we know that the distance between the surgeon and the aërial image is 10 inches. Therefore, the distance between the image and the patient must be 8 inches. That is to say, the rays of light leaving his eye to form this image must converge to 8 inches in front of his eye, and, therefore, this patient must have about 8 inches—i.e., 5 D of myopia. Had the distance between the two eyes been 20 inches, then the patient would have about 10 inches = 4 D of myopia, and so on for any distance. This method is best applied to the higher degrees of myopia. Schmidt-Rimpler, some years ago, invented an apparatus for making this method applicable to all cases of ametropia. It has never, however, come into general use in this country.

THE PATHOLOGY OF MEDIASTINAL TUMOURS, WITH SPECIAL REFERENCE TO CLINICAL DIAGNOSIS.

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(Continued from vol. xxxv, p. 424.)

I shall now give a clinical account of what I believe to have been a typical case of Hodgkin's disease, in order that it may be compared with the cases of mediastinal tumour which have just been related, and that it may serve to illustrate the opinions I have already expressed as to the pathology of this very interesting and somewhat obscure affection.

Case 3. Clinical Account of a Case of Hodgkin's Disease, with great enlargement of the Lymphatic Glands and Spleen, and fluctuating Pyrexia.—Alice D., aged 17, unmarried, English, a mill-girl, was admitted into Ward II of the Glasgow Royal Infirmary on the 22nd August, 1887, and she came
under my care in September of the same year, when I took
duty for Dr. Wood Smith during his absence on holiday.
The case clinically presented all the characteristic features of
Hodgkin's Disease, and on the 17th September, 1887, and
following dates, I made careful clinical notes of her history
and physical condition.

17th September, 1887.—About seven months ago she first
noticed a glandular swelling on the right side of the neck,
which seemed to come and go for a time, but latterly became
permanent, and was followed by similar swellings on the
opposite side of the neck, along the sterno-mastoids, in both
axillæ, and in the groins. The glandular swellings have
never suppurred, have never been painful, and are not tender
on pressure. The enlarged glands have produced great defor-
mity of the neck, especially below the ears and around the
angles of the lower jaw, imparting a bovine character to the
face and neck. The tumours vary much in size, and although
they form enormous masses, they apparently remain quite
isolated from one another. The isolated swellings can be
traced right down the sterno-mastoid muscles continuously
into the axillæ, where some of them are nearly as large as
hen's eggs. In the groins also there are numerous large
masses, which are isolated, firm, and painless. The lymphatic
gland, situated above the internal condyle of each elbow-joint,
is considerably enlarged. The veins in front of the neck on
both sides are slightly dilated, as are also those in front of the
chest.

On palpating the left lumbar region a dense, firm, painful,
sharp-edged tumour is made out filling it entirely—obviously
an enlarged spleen. The splenic notch cannot be felt; the
anterior edge of the spleen approaches to within 2½ inches of
the umbilicus; from the upper to the lower border of splenic
dulness in the axillary line measures 5¾ inches; the lower
border is situated about 2½ inches above the level of the
anterior superior, and 1½ inch above that of the posterior
superior spinous process of the ilium. The splenic tumour
distinctly descends with a deep inspiration.

The abdomen, generally, is somewhat distended, but no
enlargement of the mesenteric glands can be made out. On
account of the distension of the abdomen it is difficult to
determine precisely the limits of hepatic dulness, but the liver
is not obviously enlarged, although there is slight tenderness
over its left lobe.

The following facts of her personal and family history are
also to be noted:—Two years ago she began to suffer from a
cough, which has never entirely left her, and since then there has been a pretty abundant mucous expectoration, but never any undoubted hæmoptysis, although she has been much troubled with night-sweats. Her appetite has been fair, and her bowels slightly costive. The apartment in which she worked was airy and well ventilated, and her work was not too hard. Her mother is still alive, and has never complained much. Her father died of "decline" seven years ago. She has two sisters and two brothers, and, so far as she knows, they have always enjoyed good health.

On physical examination, percussion and auscultation of the apices in front give normal results, but in the right mammary region slight impairment of resonance and abundant moist crackling râles on inspiration are detected. Posteriorly there is some dulness at the extreme bases, with harsh breathing. Since admission, the temperatures have been very distinctly febrile, only once reaching the normal, and almost always above 99° F., with occasional exacerbations to 102° or 103° F., lasting for a day or two. On the occasion of the first exacerbation of temperature the glands became more swollen; on the second severe pain was complained of over the region of the spleen (see Chart).

21st September.—It is thought to-day that the tumours are somewhat less in size, and the patient feels exceedingly well. A careful microscopic examination of blood drawn from the finger is undertaken. The naked eye characters of the blood present nothing remarkable, and with the microscope nothing abnormal is detected, there being no excess of white blood corpuscles, and the red corpuscles being of uniform size and well formed. A careful examination with Zeiss' hæmacytometer gives 3,500,000 per cubic millimeter, a by no means extreme degree of anæmia.

27th September.—Since the 23rd inst. the temperatures in this case have again been somewhat higher than during the previous seven days, the evening rise predominating. She has been feeling fairly well, but this morning the glandular swellings are very distinctly larger. Iodide of potash, of which she has been taking 10 grains thrice daily since the 17th, is to-day increased to 15 grains.

3rd October.—Since the last note was made there has been a progressive rise of temperature, the evening rise being always the higher, but the morning remission never coming so low as on the previous day. The rise reached its acme on the evening of the 1st inst., when 103° F. was touched, since which there has been a gradual fall, and this morning the
temperature is 101.4° F. Coincident with this rise in temperature there has been no marked constitutional disturbance, the only complaint having been of cramps or colicky pains in the abdomen on the 1st inst. She has all along been subject to such attacks, but on that day they were worse than usual. There can be no doubt about the presence of considerable increase of enlargement in the glandular swellings, especially in the left axilla, and she states that several new swellings have appeared in the neck. A physical examination of the chest reveals nothing but a few musical and moist râles diffused over both sides, but specially abundant in the right. The cough is slight, and expectoration simply mucous.

14th October.—The patient was dismissed to-day in statu quo, at her own request. I afterwards learned that she had been readmitted a few months later to a different ward, and had died; but unfortunately no post-mortem examination could be obtained.

It seems to me that in the case just recorded we have a tolerably accurate picture of the disease which Hodgkin described, and to which his name has been given. It is quite conceivable that a large mediastinal tumour might form as one of the incidents in the development of this disease, but in such a case the mediastinal lesion would manifestly be nothing more than a part, and probably an insignificant part, of the whole affection. Under such circumstances the mediastinal tumour could have no real or intimate relationship to such lesions as are exemplified in the two cases of lympho-sarcoma already related, and in the two whose histories are immediately to follow.

The following case of lympho-sarcoma of the mediastinum occurred shortly after the termination of the course of post-graduate lectures, at which the previous cases were demonstrated and described. The patient was under the care of Dr. Samson Gemmell in the Glasgow Royal Infirmary, and as regards the clinical history and diagnosis I shall quote the account given by that gentleman in bringing the case before the Glasgow Pathological and Clinical Society,* on which occasion I was associated with him in the demonstration and description of the anatomical details.

**Case 4. Limited Lympho-sarcoma of the Mediastinum involving the Vena Cava Superior, with characteristic localised Edema and Venous Engorgement, and Secondary**

*Glasgow Medical Journal, vol. xxxv (February, 1891), p. 154; also Glasgow Royal Infirmary Museum, Series X, 234 E.*
Nodules in the Lung.—"A. F., aged 60, a labourer, was admitted to Glasgow Royal Infirmary on 23rd September, 1890, complaining of cough and spit, shortness of breath, and a choking sensation in the throat. The cough has been present more or less for many years, but the more urgent symptoms were only of six weeks' duration. He could assign no special cause for them, but thought they might be due to exposure, as for a week prior to their onset he had been engaged cleaning and painting one of the river steamers, and had on sundry occasions got himself very wet. He always considered himself a healthy man, and was temperate in his habits. He is described on admission as 'presenting a flushed and bloated appearance, with considerable oedema about the lower eyelids.' The temperature was normal; the pulse 82, regular and of good quality; the respirations 18, noisy and wheezing. No oedema was present in the legs or feet, and there was no ascites. Examination of his chest revealed a prolonged and somewhat feeble R.M., and in the lower part of the chest expiration is noted as being accompanied by snoring râles, which at the extreme base were associated with mucous râles. The abdominal organs were healthy, and the urine non-albuminous.

"The patient was admitted while I was on holiday, and on my return to duty was introduced to me as a case of chronic bronchitis. It was quite evident, however, that another construction was to be put upon it, and on the 10th October I embodied my view of the case in the following note:—The whole progress of this case since admission has been strongly suggestive of intra-thoracic tumour, of what nature is as yet undetermined, although the occurrence of a circumscribed area of dulness in the region of the manubrium sterni, with a highly musical and deep-toned quality of the second sound in this situation, and a difference in the force and rhythm of the radial pulses, the left being much weaker than the right and somewhat delayed, are strongly suggestive of aneurism, although there is no pulsation perceptible over the dull area. The face, neck, upper part of the chest, and arms are markedly oedematous; while the abdomen and lower extremities, although he has been in the sitting posture all night, present almost no trace of oedema. The urine is non-albuminous, and the temperature strictly normal. The veins in the neck are greatly distended, but so far as palpation can be pursued, no enlarged glands are found above the clavicle, such as might be present in malignant disease within the thorax; and the trachea, which is strictly in the middle line, is normal in position, and there is no pulsation of the jugular
fossa. The face is much congested, the mucous membrane of
the lips livid, and respiration, though it cannot be said to be
very difficult, is accompanied by distinct stertor, both expira-
tory and inspiratory. The voice is somewhat hoarse, but the
cough has no brassy character. Examination of the larynx
reveals the fact that the mucous membrane of the pharynx and
larynx participates in the œdema. The entrance to the glottis
is narrowed by lateral compression of the epiglottis, due to
the surrounding œdema; but the epiglottis itself is not very
œdematous. Beyond the narrow chink the cords are plainly
visible. Their movements are perfectly normal; and, except
for a slight linear injection, their general appearance is
healthy. Several of the rings of the trachea are seen beyond
the cords, and there appears to be no compression in that
region.

"There is no complaint of pain, and, indeed, there has been
none during the course of the illness; nor have there been
any disordered sensations such as might be attributable to
pressure on nerves.

"He grew rapidly worse, the obstruction to the venous
circulation soon giving rise to serious cerebral disturbance.
He became first delirious and then comatose, and died on
14th October, 1890."

Post-mortem Examination.—16th October, 1890.—To-day
I made an examination of the body, and wrote the following
report:—The body is that of a well developed man, apparently
between 60 and 70 years of age, of fair complexion. The
head, chest, and upper limbs are very œdematous. The costal
cartilages are calcified, and on raising the sternum a lobulated
tumour is found in the mediastinum, above the pericardium
and a little to the right side. The left lung is adherent to
the chest wall by fibrous bands, due to old pleurisy; the right
lung is also slightly adherent towards its apex. The thoracic
organs, including the tumour, are removed en masse for more
detailed examination. On cutting into the lungs, a few
secondary nodules resembling the primary tumour tissue are
found in the right lung, but otherwise these organs appear
to be normal. The liver is of ordinary size, and its tissue
presents normal characters; the spleen is of normal appear-
ance, but has a thickened white patch of circular shape at
one part of its capsule; the kidneys are congested, the cortex
and pyramids are not sharply defined, and the capsule strips
off with ease. The tumour, with the heart, trachea, and
blood-vessels, is placed in spirit for dissection.

23rd October.—The dissection of this tumour is completed
to-day, and it may be described as a remarkably isolated lobular mass, measuring fully 4½ inches in long diameter, and nearly 3 inches from before backwards. The cross measurement of its anterior surface is 2½ inches. The tumour occupies the right side of the upper portion of the anterior, middle, and posterior mediastina. It also projects upwards into the right side of the neck for a considerable distance, reaching as high as the fourth tracheal ring. Its internal margin corresponds very closely to the outer edge of the first portion of right carotid artery, and the lower part of the tumour overlaps the pericardium, from which, however, it is quite separable; the overlapping portion of the growth lies in front of the first part of the aortic arch. The tumour has the following relations to venous and nervous structures:—The left innominate vein passes right through the growth, entering it about the middle of its internal margin. The vena azygos also passes into the mass at the lower portion of its posterior surface. The right innominate vein and the vena cava superior pass vertically through the substance of the tumour. The superior vena cava is laid open by an incision along its right border, when it is seen to be closely encircled by the tumour, and between the points of entrance of the left innominate and azygos veins polypoid projections of tumour tissue into the venous lumen have taken place. The right vagus passes over the posterior surface of the mass, and is somewhat adherent to it, having been slightly flattened and pressed upon. The right recurrent nerve has not been involved in the tumour. The left vagus and recurrent present healthy characters. There is no pericarditis.

Microscopic examination of fresh scrapings and of hardened portions of the tumour show a characteristic lympho-sarcomatous structure. The tissue is composed of small round, sometimes slightly oval cells, with here and there a very delicate and irregular fibrous stroma; sometimes there is no stroma. At many places the tumour is possessed of a capsule, which, however, is intimately related to the subcapsular tissue, and is incapable of being stripped from the surface of the growth. Under the microscope this capsule is observed to be infiltrated with round cells similar to those composing the groundwork of the growth, and to be exceedingly vascular. At some places the infiltration of lymphoid cells into the capsule is very dense, and in stained specimens the leucocytes contained within the distended capsular blood-vessels present very similar appearances to the stained cell elements outside of them. At certain points the capsule is seen to send trabeculae
CASE 4. LYMPHO-SARCOMA OF MEDIASTINUM.

a. Tumour.
b. Left Innominate Vein.
c. Heart, with a portion of Pericardium.
d. Root of Left Lung.
e. Arch of Aorta and Great Vessels.
f. Left Pneumogastric Nerve.
g. Trachea.
into the substance of the growth in the same way as would be seen in a lymphatic gland or a section of the spleen. The small lymphoid-celled tissue of the interior of the tumour is also seen to be very vascular at certain parts, and occasionally small hemorrhages are observed to have taken place into the substance of the tumour.

Case 5. Lympho-sarcoma of the Mediastinum, involving the Left Lung and Bronchus; Aphonia due to Paralysis of Left Vocal Cord; Acute Pericarditis.—Rose Ann M'C., aged 45, a hawker, was admitted on the 6th December, 1888, to Ward X of the Glasgow Royal Infirmary, under the care of Dr. Samson Gemmell, who diagnosed a tumour of the left lung or its vicinity. The following epitome of the clinical history was supplied by Dr. Gemmell to the Pathologist. On admission, the patient complained of cough, pain in the left side, and pain in the stomach. There was a history of chronic bronchitis of ten years' duration. She had been a hawker, and was therefore much exposed to cold and damp. About ten weeks before her admission she began to suffer from pain between the shoulders and in the stomach, with much flatulence; and these symptoms persisted throughout the case. Eight weeks before she came into hospital the cough became much worse, and aphonia for the first time showed itself. The latter symptom began as a hoarseness, and when the patient was admitted she spoke in a husky whisper. On physical examination, flattening and diminished movement of the left side of the chest were discovered, with absolutely dull percussion over the left anterior aspect of the thorax, where no respiratory murmur could be made out. It was also noted that immediately above the clavicle on the left side there was a decided sense of fulness, dipping down behind that bone. Posteriorly over the left lung the percussion was dull as far as the middle of the interscapular space, and the breathing, though diminished, was tubular. There was absolute paralysis of the left vocal cord, but the larynx was otherwise normal. On the 9th February, 1889, extensive pericarditis occurred, and lasted for nearly four weeks. After this bulging of the left chest wall, with localised œdema, took place, to be soon followed by general œdema. The urine was non-albuminous on admission, albuminous during the period of pericarditis, and again non-albuminous before death. The liver was enlarged and painful, but not nodular; the stomach was dilated, and there was a sense of fulness in the left lumbar region behind. Death took place on the 18th March, 1889, and an autopsy was held on the 21st March.
Description of the Tumour.—This case occurred in the time of my predecessor, and I find that no record of the post-mortem examination has been preserved either in the Ward Journal or in the Post-mortem Report Book. The specimen was found in a semi-dissected state in the preparation room of the Infirmary; I have completed the dissection of the tumour, and have mounted it for the Museum. The case was a typical one of lympho-sarcoma, involving mainly the anterior and middle mediastina, and closely surrounding the arch of the aorta and the bifurcation of the trachea. The tumour had also encroached upon the upper portion of the anterior layer of the pericardial sac, and a distinct pericardial fibrinous exudation was present. The left main bronchus was very seriously involved in the tumour tissue; at one point, just where it entered the lung, the whole bronchial wall was replaced by the tissue of the growth, and the lumen of the tube was very seriously diminished as a result. The growth was a bulky lobulated mass which had scarcely at all involved the posterior mediastinum. The only venous trunk which was found to be seriously interfered with by the tumour was the left innominate, which passed over the upper portion of the growth, to which it was very firmly adherent. The superior vena cava was remarkably free from the tumour; it was in contact with it at its left margin, but no deleterious pressure seemed to have been exercised. The relations to nervous structures were of some interest. The right pneumogastric and recurrent were found to be normal and in no way related to the tumour, a fact which may still be seen in the specimen preserved in the Museum. The left pneumogastric was very seriously involved at the point where the recurrent hooks off beneath the arch of the aorta. Here the nerve trunk had been very severely crushed between the tumour on the one hand, and the arch of the aorta and the left bronchus on the other. It was impossible to follow out the trunk of the nerve at the seat of pressure, but beyond this it was quite possible to trace up the recurrent towards the larynx. The condition as regards the left pneumogastric and recurrent in this case was exactly that which is so often found in cases of aneurism of the arch of the aorta, and is of interest accordingly. The pulmonary tissue had been wonderfully little encroached on, although at the root of the lung it was obvious that the growth was extending along the walls of the main bronchi; and at the extreme base, where the lung came into contact

* Glasgow Royal Infirmary Museum, Series X, 234 D.
with the greatly infiltrated pericardium, a nodule of tumour tissue the size of a walnut was found.

Portions of the tumour related to the aorta, to the pericardium, and to the lung, were cut into sections and carefully examined under the microscope. The tumour was found to be composed of small, round, lymphoid cells, embedded in a pretty abundant, but quite loose and irregular stroma. No distinct alveolar arrangement of the stroma was anywhere apparent, but here and there in some of the sections examined a state of matters was seen to which some might have been inclined to apply the term endothelioma or alveolar sarcoma; but the lymphoid character of the cells, and the quite irregular arrangement of the fibrous stroma, left in doubt in my mind that the tumour was an ordinary lympho-sarcoma of the mediastinum. Under the microscope it was seen that, although intimately related to the tumour, the substance of the aortic wall had not been encroached upon.

**Varieties of Sarcoma of the Mediastinum.**

Hitherto we have been mainly occupied with the consideration of that form of mediastinal sarcoma which originates in connection with the lymphatic structures within the thorax. From what has already been written, and from a consideration of the cases which have been recorded, it will have been gathered that I hold the term lympho-sarcoma to indicate that variety of sarcoma which, both by its naked eye appearances and its histological characters, is to be looked upon as originating in connection with the lymphatic glands—i.e., a sarcoma of the lymphatic glands. In this sense a lympho-sarcoma is to be regarded as a variety of sarcoma in the same way as a cylinder-celled epithelioma is to be looked upon as a variety of epithelioma originating in connection with the cylinder-celled structures of the intestinal mucous membrane. Thus, a lympho-sarcoma may originate in one gland, or in a part of one gland, and in its growth may surround and involve neighbouring glands, which may be quite recognisable in the midst of the tumour tissue. I have seen this in specimens of mediastinal lympho-sarcoma, and it is a circumstance quite in keeping with what we know to take place as regards the relationship of cancerous tissue to the healthy tissue around it, whose type the carcinomatous tumour follows. Thus, in some of the specimens of mediastinal sarcoma in the Glasgow Royal Infirmary Museum, isolated, rounded, pigmented bron-
chial glands are to be seen embedded in, and completely surrounded by, the new tissue.

It must not be forgotten, however, that sarcomatous tumours may originate within the chest in connection with other tissues, although, no doubt, less frequently. Sarcomata may take origin in the subpleural tissue, and grow into the mediastinum. In illustration of this, I may refer to a case shown by Dr. R. S. Thomson at the Glasgow Pathological and Clinical Society.* The case need not be quoted in detail, but it may be indicated that the mass weighed 3 lb. 5 oz., and was situated in the anterior mediastinum of a child aged 10. It occupied pretty much the position of the heart, and the left lung was much collapsed. The diagnosis was glandular tumour of the mediastinum. The microscope showed the specimen to be composed of "small spindle-celled sarcomatous tissue, combined with a large amount of very fibrous connective-tissue." The tumour was entirely covered with pleura, and Dr. Joseph Coats regarded it as of subpleural origin. Such mediastinal tumours seem to be not uncommon in very young children, and a very remarkable case of this kind has recently been reported by Dr. Angel Money.† From the brief account we have seen of this case we think it not at all impossible that it may have had a subpleural origin.

Virchow‡ also holds, and the statement will be found repeated in most of the text-books, that sarcomata may also originate in connection with the thymus gland, but of such tumours I have had no personal experience.

**RELATIONSHIPS OF MEDIASTINAL SARCOMA.**

It is now necessary to refer to the relationships which mediastinal sarcomata may come to form with neighbouring and distant parts. These may vary a good deal according to the form of sarcomatous tumour which is present. Thus, a subpleural sarcoma, such as that reported by Dr. R. S. Thomson, may simply cause pressure effects, crushing the organs aside without involving them to any very great extent. With regard to lympho-sarcoma, which I believe constitute by far the largest proportion of mediastinal sarcomas, the case is somewhat different. This form of sarcoma presents very typical local malignancy, which plays an important part in

† British Medical Journal, 10th November, 1888, p. 1,046.
‡ Loc. cit.
determining the relationships of the tumour. Of these relationships we could have no better illustration than the cases which I have related in full, and the specimens contained in the Glasgow Royal Infirmary Museum, which I have carefully studied and re-examined with a view to this essay. In the entire series of cases there is a most remarkable uniformity as regards their mode of behaviour to surrounding parts and their histological structure. We may consider, then, first the local relationships of mediastinal sarcomata.

Origin in Lymphatic Glands.—It has been well remarked by Fagge and others that at the time of the post-mortem it is often difficult to say precisely where the tumour has originated. But although oftentimes we have a large nodulated mass, the general appearance of the tumour, as well as its histological structure and its anatomical situation, is strongly suggestive of origin in the glands. I think it not unlikely that the majority of nodulated conglomerate mediastinal sarcomata are glandular in origin, while the simple, rounded, firm tumours occasionally met with, especially in children, spring from the subpleural connective-tissue.

Relationship to the Pulmonary Tissue.—A very striking feature of the tumours is the readiness with which they spread in upon and work up the pulmonary tissue. This tendency was so striking, and the extension took place in such an irregular, and one might say crab-like manner, that in investigating my earlier cases I could scarcely believe that I was not dealing with a cancerous tumour, till I looked at sections under the microscope. Very frequently the encroachment on the lung-tissue takes place along the bronchial tube, but sometimes, as in one of the cases related, the tumour moulds itself directly to the edge of the lung and begins to work it up. I have also, in one of the old museum specimens, observed appearances which are suggestive of the tumour growing into pulmonary cavities, much in the same way as intra-cystic growth occurs in mammary adenomata.

Relationships to Trachea, Ösophagus, and Blood-vessels.—Perhaps, however, the most characteristic feature of mediastinal lympho-sarcomata is the manner in which they mould themselves round the great tubular and vascular structures of the upper portion of the thoracic cavity. All the specimens demonstrated illustrate this point more or less fully. The structures most liable to be involved in this manner are the
great vessels, and the trachea and bronchi. You find the aorta and large arteries springing from it often completely buried in the midst of tumour tissue; but, as a general rule, by careful dissection the morbid tissue can be pretty completely separated from the arterial wall. The veins suffer from the encroachment of the tumour much more severely than the arteries, and in some of the specimens well marked intravenous growths of the morbid tissue may be seen. This is an anatomical point of the very greatest importance in connection with the diagnosis and extension of intra-thoracic tumours. Dr. Maguire* has expressed his opinion, founded on his experience, that lympho-sarcomata have little, if any tendency, to destroy the endothelium lining the vessels which they invaded, whereas ordinary sarcomata ulcerated into the vessels and caused haemorrhages. I am not inclined to agree with Dr. Maguire in this view; but then it is not unlikely that what Dr. Maguire would call an ordinary sarcoma of the mediastinum I would call a lympho-sarcoma. The bronchi very frequently suffer severely from the local malignancy of lympho-sarcomatous mediastinal tumours. The whole normal histological structure of the bronchial wall may entirely disappear, nothing being left but a channel, more or less narrowed, through the tumour tissue. Some of the microscopic specimens which I have prepared show the gradual destruction of the bronchial tissue exceedingly well. It is not at all unlikely that in many cases the bronchial tubes may be very considerably dilated, the bronchiectasis being partly due to the local action of the tumour on the bronchial wall, and partly due to paralytic conditions induced by pressure on nerves or plexuses, to be more particularly adverted to immediately.

* Relationship to Nervous Structures.—The nerve trunks of the thorax are often found to pass into and become buried in the midst of the tumour. Sarcomata of the mediastinum seem to behave differently to aneurism as regards their mode of involving the nerves. Aneurism, as is well known, crushes the nerve trunk aside and destroys it by pressure. Sarcoma, on the other hand, appears to surround it much in the same way as it does a bronchus or an artery. Whether it destroys the nervous continuity by so doing my observations do not allow me to say, but in one case of lympho-sarcoma of the neck, where the common carotid, jugular vein, and pneumogastric were deeply buried in tumour tissue, and where the vein was

plugged by an ingrowth, I have still been able to find and dissect out the nerve trunk. In our ordinary clinical experience, irritative and paralytic nervous symptoms are perhaps not so frequently associated with solid as with aneurismal tumours within the chest. While this may be so, however, there can, I think, be little doubt that a number of the symptoms met with in the course of a case of mediastinal tumour (and probably some which, at first sight, are not obviously nervous in origin) may be due to interference with the nerve trunks and plexuses within the thorax, an opinion which may be verified by a reference to the cases I have already recorded. In this regard an important paper by the late Sir William Gull is deserving of notice.* He shows that destructive changes in the lungs, after experimental division of the pneumogastric nerves, only take place when both nerves have been cut. When only one nerve has been divided, the free anastomosis in the pulmonary plexus is sufficient to maintain the nutrition of the lungs. Under pathological conditions, however, the lung is apt to suffer even if only one nerve is involved, because when the mediastinum is the seat of disease the pulmonary plexus is likely also to be injuriously affected. He supports this conclusion by citing a series of cases, including one of fibrous, probably malignant thickening of the mediastinum. He attributed the injurious effects on the lungs to paralysis of the bronchial tubes. In 1879 Dr. James Goodhart‡ published a very valuable paper calling attention to the part which enlarged mediastinal glands play in the production of spasmodic asthma in children, by interfering with the mediastinal nerves, and giving rise to peripheral irritation. In the case of an adult he was inclined to regard coma as having been induced in a similar way. He thinks that spasm so induced is not glottic, but rather a spasm of the whole lung—spasmodic asthma. A number of references to spasmodic asthma caused by mediastinal gland enlargement will also be found in this paper. These circumstances, then, should lead us to pay particular attention to any nervous phenomena which may develop in the progress of cases of mediastinal tumour. Dr. Hilton Fagge also calls attention to interesting vaso-motor and papillary phenomena due to the pressure of mediastinal new-growths upon the sympathetic trunk within the chest.‡

* "On Destructive Changes in the Lung from Disease in the Mediastinum invading or compressing the Pneumogastric Nerves and Pulmonary Plexus." (Guy's Hospital Reports, New Series, vol. v.)
‡ Practice of Medicine, second edition, vol. i, p. 1,002.
It is not improbable also that the vomiting which is sometimes present in cases of mediastinal sarcoma, and which was very troublesome in Case 1, as well as the gastralgia and flatulence so often met with, may be nervous in origin. In corroboration of Goodhart's observations, it is also worthy of note that at least two of the cases of lympho-sarcoma, which I have related, became comatose before death. In connection with cancer of the mediastinum, originating in the wall of the oesophagus, I shall also have to call attention to the circumstance that gangrene of the lung, a not uncommon mode of termination, is frequently to be related to nerve trunks being involved in the malignant mass. In Case 5 we have an example of absolute paralysis of the left vocal cord, from pressure exerted by the sarcomatous mass on the trunk of the left pneumogastric, where it gives off the recurrent, the nerve being flattened between the tumour and the artery; and in the case of sarcoma of the neck (referred to at the beginning of this section), in the midst of which I found the trunk of the pneumogastric buried, the dyspnœa leading up to death was so severe that tracheotomy was performed. The dyspnœa, however, was largely due to spasmodic contraction of the bronchi from irritation, and so the opening of the windpipe did little good, although it may have relieved what part of the respiratory distress which was due to spasmodic closure of the vocal cords, a condition which generally accompanied the bronchial spasm. For information with regard to this very interesting case, in which the tumour originated in the right posterior triangle of the neck about 9 weeks before death, I am indebted to my friend, Dr. John Macintyre, who performed tracheotomy in the hope, at least, of relieving that part of the spasm which took place within the larynx. The first attack of dyspnœa occurred about 3 weeks after the growth was first noticed. The operation was not accompanied by relief of the spasms, and in the midst of a very prolonged attack the patient died. Dr. Macintyre has also given me the opportunity of examining another case of sarcoma of the posterior triangle of the neck, accompanied by precisely similar laryngeal and bronchial spasms, due to pressure on the pneumogastric trunk.

Pericarditis and Pleurisy excited by Mediastinal Sarcoma.—Another very important feature of mediastinal sarcomata and other malignant tumours of this region is the great tendency, which they have, to excite inflammatory action—generally of a very acute kind—in the serous mem-
branes with which they come immediately in contact. Acute pleurisy and pericarditis are among the most common complications of malignant disease of the mediastinum, and this phenomenon is very well illustrated in three of the cases (1, 2, and 5) that have already been related; and in Case 5 it was recognised for a few weeks before the fatal issue. The occurrence, therefore, of an acute inflammation of the pleura or pericardium in the course of a case whose signs and symptoms point in the direction of mediastinal tumour, is a circumstance of very great importance in the establishment of diagnosis. A train of clinical phenomena, which for a long time may have been obscure and perplexing, will often be explained by the sudden and unlooked for development of an acute pericarditis or pleurisy, although the explanation may not come till pretty late in the case. While this is so, however, care must be taken, on the other hand, not to confuse the secondary with the primary affection. As has already been seen in connection with one at least of the cases (Case 2) now recorded, it is very easy to mistake the physical signs of a mediastinal neoplasm for those of a simple pleurisy with effusion. There are, however, in connection with the signs of mediastinal tumour which resemble those of pleurisy or pericarditis, two circumstances which should prevent such an error of diagnosis from being made. First, if an exploring needle be used and no fluid be obtained, as happened after repeated trials in Case 2, the presumption is that we are dealing with a solid tumour, whose dulness to percussion may be so absolute and intense as to resemble that of fluid pleural effusion. And second, even if fluid should be discovered, as the result of an exploratory puncture, its character is generally such as at once to suggest that the serous inflammation is secondary to tumour formation. In the great majority of secondary serous inflammations the inflammatory process is of a hæmorrhagic type, and the fluid withdrawn by the aspirator is in consequence sanguinolent. Whenever we obtain hæmorrhagic fluid as the result of paracentesis thoracis, the presumption generally is greatly in favour of a pleurisy or pericarditis secondary to malignant disease, either sarcomatous or cancerous, within the chest. In this regard, then, the pathological anatomy of mediastinal tumours becomes of the very greatest importance to the clinical physician in his efforts at diagnosis, and affords another proof of what I have already alluded to, that the mere accurate determination of physical signs is insufficient by itself to establish the diagnosis of primary
new-growths within the chest. In the fourth case recorded
in this essay, the lympho-sarcomatous tumour had not pro-
duced a pericarditis, although the lower part of the growth
lay immediately in contact with the upper and anterior
layer of the pericardium. But this simply shows that it
is only after the serous membrane has been intimately
involved in the growth of the neoplasm that inflammatory
reaction occurs.

In none of the cases that I have examined did purulent
inflammation result from the growth of the tumour. The
serous inflammation set up by the extension of malignant
growths is an exceedingly intense and acute one as a rule,
a circumstance which is fully proved by the sanguinolent
nature of the fluid effusion, and by the very abundant
fibrinous exudation usually met with, but the inflammation
seldom or never results in pus. This circumstance is probably
to be related to the fact, now fully established by numerous
researches and observations, that purulent inflammations are
caused by the action of special varieties of micro-organisms.
In the growth of malignant tumours we possess as yet no
evidence that specific bacteria play any part, and therefore
the inflammatory action which they excite in neighbour-
ing parts, although very acute, is a simple inflammation—
simple in the sense that it is due merely to the influence
of a simple, aseptic irritation.

Tendency to increase in direction of least resistance.—It
is also a character peculiar to the growth and extension of
lympho-sarcomatous tumours of the mediastinum that they
tend to grow in the direction of least resistance. The manner
in which sarcomata of this region insinuate themselves in and
out between the different structures in their neighbourhood is
a feature which must have frequently struck all, who have
investigated the pathological anatomy of mediastinal new-
growths. Bulky and lobulated as most lympho-sarcomata of
the interior of the thorax are, they do not simply crush the
organs aside, as many other varieties of tumour would do.
You find processes of the growth peeping out beneath the
arch of the aorta, pushing their way upwards beneath the
clavicles into the triangles of the neck, insinuating themselves
between, and applying themselves around, the great blood-
vessels of the root of the neck and the bronchial stems; and all
this without there necessarily being any actual incorporation
of the surrounded structures and tissues into the substance of
the tumour—itsclf, at least in the first instance. In this way
the growth of a thoracic sarcoma differs in the most marked manner from that of a primary cancer within the chest. The cancer, as a rule, never becomes so bulky as a sarcoma; and in its growth it steadily infiltrates, and causes ulceration of everything coming into contact with it, in this way even ulcerating through the wall of the thoracic aorta itself, and leading to fatal hemorrhage. And in the case of cancer this may occur with a minimum of growth of the tumour as regards its bulk. Sarcomata of the chest, in my experience, never cause erosion of bone, or exercise the very striking pressure effects sometimes witnessed in cases of aneurism, for instance. The variety of sarcoma most likely to give rise to pressure effects pure and simple is that which I have described as of subpleural origin, and as being most commonly observed in the case of children. Here the tumour is liable to present itself as a single rounded mass, with a very considerable fibrous basis, and hence simple pressure effects are more likely to occur.

In the second place, it is necessary to consider briefly the relationships between sarcomata of the mediastinum and distant parts. In thinking of this subject, it is essential to remember the division of sarcomata of the mediastinum into primary and secondary. The changes induced secondarily in distant organs by primary sarcoma of the mediastinum are of metastatic origin; and, of all the primary sarcomata of the mediastinum, there can be no doubt that the variety which has been denominated lympho-sarcoma is the most prone to metastasis. This is a circumstance not to be wondered at in connection with this variety of mediastinal sarcoma when we think of the very intimate manner in which the veins are involved in, and worked up by, the tumour tissue. Metastatic nodules, having all the characters of the primary thoracic mass, may be found in the lungs, the liver, the spleen, and the kidneys; and, if the cases recorded in this essay be consulted with reference to this point, ample evidence of it will be found.

As I have already pointed out, secondary sarcomata of the mediastinum are comparatively unimportant from our present point of view, and therefore it is unnecessary that they should be discussed at any length. For obvious anatomical reasons, it is very probable that secondary sarcomata of the mediastinum are less frequent than similar tumours in the lungs; and it is also not unlikely, when a secondary mass does fill up the mediastinum, that it may have spread from the lung. Of all malignant tumours, the sarcomata are those which are
most likely to be soon complicated by the development of secondary tumours within the chest, and it will be sufficient for the present purpose if I give a short account of two cases, which have quite recently come under my own observation.

**Case 6. Sarcoma within the Chest Secondary to Primary Tumour of the Testicle, causing Death about a year after Primary Tumour was first observed.**—The patient, a gentleman 35 years of age, was seen by me upon several occasions during his last illness in consultation with his medical attendant. He had been the subject of a congenital inguinal hernia, for which he underwent an operation about 8 years before his death, when it was discovered that the testicle was small and undeveloped. About a year before death the testicle began to enlarge, the enlargement being regarded as probably of an inflammatory nature. When I was asked to see the patient, about 2 months before his death, the primary tumour was the size of an infant's head, and my advice was sought concerning his general state, which was one of very moderate pyrexia, the temperature highest in the evenings, and accompanied by slight feelings of *malaise*. At my first visit nothing could be detected in the lungs, but in the course of a few days slight dulness and a very faint crackling râle were detected at the right pulmonary base posteriorly. About this time he had an attack of pain in this region, which passed off in the course of a few days. As the surgical treatment of the case depended upon the state of the lungs, the physical signs in the chest were carefully investigated from time to time. The dulness soon became quite distinct, and the râles more numerous. A constant, irritating cough, *without expectoration*, set in, the breathing became much embarrassed, and in the course of about six weeks he died with all the signs and symptoms of a secondary intra-thoracic tumour. In this case the cough, though not brassy or incomplete, was quite obviously reflex, and was always referred by the patient himself to a tickling sensation in his larynx. The absence of expectoration almost throughout was a notable feature in the case; and several severe attacks of spasmodic dyspnœa occurred before the fatal termination. From a medical point of view, the case was of the very greatest interest, as showing the length of time that is likely to elapse between the earliest symptoms that could be regarded as indicative of thoracic recurrence and the fatal issue, and also as demonstrating the exceedingly insidious and almost imperceptible manner in which the chest becomes involved.
Case 7. Secondary Sarcoma of the Posterior Mediastinum and Pleura, causing death 18 months after completely successful Removal of the Primary Tumour of the Femur by Amputation through the Hip-joint.—The patient was a girl, aged 9 years, who died in Dr. Wood Smith's wards of the Glasgow Royal Infirmary on the 22nd December, 1890. The left leg had been amputated through the hip-joint by Mr. H. E. Clark in June, 1889, for sarcoma of the femur. The patient was readmitted under the care of Dr. A. Wood Smith on 25th November, 1890, suffering from cough and dyspnoea. There was no expectoration, or, at most, a scanty amount of pearly mucus. The respiratory movements over the left base were restricted, and the vocal fremitus in the same region was diminished. Over the base of the left lung the percussion was dull, and the dulness extended as high as the spine of the scapula behind, and above the nipple in front. Over the left apex the percussion note was slightly tympanitic in quality. The respiratory murmur was very much diminished over the whole left lung, and bronchial râles were generalised throughout the chest. The cardiac impulse was situated in the sixth right intercostal space, and was slightly internal to a line let fall from the right nipple. The signs suggested pleuritic effusion, and on the 27th November paracentesis of the left side of the thorax was performed without any fluid being found. The dyspnoea and lividity became more and more severe, and for a week before death the patient could only rest in her cot in the genu-pectoral position. She died on 22nd December, 1890, about 18 months after the primary tumour had been removed.

I conducted a post-mortem examination of the body on 23rd December, 1890. The body was that of a well nourished child, whose left leg had been amputated at the hip-joint. The cicatrix was perfectly normal, without any sign of malignant growth. On being cut into, the tissues around it were seen to be perfectly healthy, and the acetabulum was found to be covered with a dense layer of white fibrous tissue. On opening the chest, the whole of the left pleural cavity was found to be filled up by a large lobulated tumour, which came well to the front, and overlapped the anterior surface of the heart. The mass was firmly adherent to the chest wall on the left side, and had apparently commenced to work up the intercostal muscular tissue. On removing the lungs and tumour, it was found that a few secondary nodules were also present in the right pleura. The other organs and regions of the body presented practically healthy characters, and there was no involvement of the abdominal lymphatic glands.
On making a more detailed examination of the intra-thoracic growth, the tumour* was found to have originated in the lower portion of the posterior mediastinum and left pleural cavity; from this it had extended forwards, gradually completely enclosing the whole of the lower lobe of the left lung and replacing its tissue. On laying the mass open, the remains of the lung were found completely surrounded, in most of its extent, by tumour tissue. In the substance of the lung a mass having all the characters of spongy bone was discovered. In the right lung a similar mass of bone was discovered in its middle lobe. The gullet and thoracic aorta were adherent to the posterior surface of the tumour, but had not been much pressed upon. No pericarditis had been excited, and the heart showed healthy characters.

Under the microscope the tumour was found to be composed mainly of spindle cells, the hard nodules in the lungs containing distinct bony trabeculae.

(To be continued.)

SEVERE EFFECTS RESULTING FROM CONTACT WITH A JELLY-FISH.

BY J. BURNETT LAWSON, M.D., ROThESAY.

During the early days of August of last year countless numbers of jelly-fishes were to be seen in Rothesay Bay. They attracted considerable attention, and were a source of interest to people upon the piers, the esplanade, and the shores, but the experience many bathers had of them was of a disagreeable, and in many cases of a painful character. I was consulted by several persons who had received stings from them, but in all but one case the effects were local—either a hand or foot, an arm or a leg, that had come into too close quarters with the floating “umbrella.” The chief symptoms were slight swelling, stiffness, redness, and an intense tingling sensation.

The exceptional case referred to so much impressed the victim and myself with the discomfort the jelly-fish was capable of producing, that I noted the more prominent symptoms.

On Wednesday, 6th August, I was asked urgently to see a visitor (Mr. J.) residing in Battery Place. On going, I found him evidently in great distress, and suffering from an unusual train of symptoms, which he attributed to the effects of an

* Glasgow Royal Infirmary Museum, Series X, 234 F.
encounter he had had with a jelly-fish when in bathing about an hour previously. When swimming out from the bathing place, considerably beyond his depth, his head and neck came into contact with a very large jelly-fish. He experienced some difficulty in getting clear of it, and in his endeavour to do so he had to use his right hand and arm; he had to dive twice, and in doing so one of his feet came into contact with it. He was also of opinion that he had swallowed some of the water in the immediate neighbourhood of the fish. Getting on shore he experienced a painful tingling sensation all over the parts which had been in contact with the fish, as well as in the eyes, the nostrils, the mouth, and throat. He was under the impression that the use of the towel intensified the effects.

When I saw him he was lying on a bed writhing in agony. The face and neck were flushed and congested, and the conjunctivae suffused. Being a most intelligent man, and quite familiar with anatomical and physiological terms, he was able to describe lucidly how he felt. He said his face and neck, as likewise his arm and leg, tingled so painfully that he could only describe it as if he had been stung with nettles, but their effects intensified a thousandfold. The eyeballs felt fixed, and the conjunctivae burned so much that he could not bear to open the eyelids. The face and lips generally felt stiff and swollen. The nares and soft palate, particularly on the left side, were similarly affected. The nostrils, mouth, and throat felt dry, and the saliva suppressed and ropy. The larynx he felt as if it were blown up like a bladder and immovable. The alimentary canal felt all affected; this, he thought, might be due to the swallowing of water in the neighbourhood of the fish. He felt a burning, uncomfortable feeling in the abdomen, which in the lower part, over the region of the bladder, amounted to a disagreeable toothachy pain. The right foot, which had been in contact with the fish, had the intense tingling sensation, which was almost intolerable, about the toes, but, in addition, he experienced a pricking sensation in the muscles of the lower extremities, which, later on, became stiff and felt numb. The temperature and pulse were little affected. With a view to relieve his immediate sufferings I administered several ounces of fluid magnesia in milk, which was to hand, applied a cooling lotion to the face, and recommended a hot bath.

I saw patient about eight hours after, when he stated he felt considerable relief from the hot bath and other means. The tingling and stiffness were almost gone from the super-
ficial parts, but he still felt a stiffness and numbness in the calves of the legs. He also mentioned, what struck him as peculiar, that the right arm, which was badly stung, after the hot bath sweated so profusely that he had to change his shirt three times.

THE TREATMENT OF CHRONIC ULCERS BY MASSAGE.

By A. ERNEST MAYLARD, B.S. LOND.,
Surgeon to the Victoria Infirmary, Glasgow.

The object of this short contribution is to advocate a method of treatment for a very common and always a very troublesome class of cases—that of chronic ulcers of the legs. The subject is based on a few cases which have been successfully treated in the wards of the Victoria Infirmary, and the histories of which I will relate. Before doing so, however, I will briefly describe the principles on which the treatment is founded, and its mode of application.

As a rule, these chronic ulcers arise from some slight accident to an area of the limb already in a condition to break down at the smallest incentive. The parts are in a condition of passive stagnation and engorgement, the result either, as most frequently, of varicose veins, or of some other obstructive influence. The result of this passive engorgement is a hyperplasia of the connective-tissue element, leading to much thickening of the parts around. This is shown by the denseness or hardness of the soft tissues, and not infrequently by some enlargement of the bone due to sub-periosteal deposits. Still further, the blood stagnation renders the new formed tissue, as also that of the old, of very low vital powers. An ulcer, then, once formed is only too likely to extend. Another important factor is the mechanical obstruction which this venous engorgement and tough new formed tissue causes in preventing the entrance of fresh arterial blood to the part, and the exit of used up material by the lymph channels from the part.

What, then, is needed in the treatment of these cases is (1) the relief of the engorged condition of the veins by the removal of the cause which engorges them; (2) the relief of the plugged condition of the lymph vessels; (3) the readmission of arterial blood to the part; and (4) the removal of deleterious exciting influences from the surface of the ulcer itself.
The recumbent position, which is usually enforced on the patient, or, failing that, the application of an elastic bandage when the patient is erect, usually aids much in removing the cause of venous engorgement of the part. But helpful as are these passive measures, they far from supply all the needs required. More active treatment is requisite to effect an entrance of arterial blood to the part, and an exit of effete material from it. This can only be done by "massaging" the limb—to wit, by rubbing, pinching, and kneading the part. The forcibly stroking the limb in an upward direction tends to drive on the venous blood, and let in the arterial: to force out the contents of the lymphatics, and to allow the entrance of other effete products.

In order to massage the floor of the ulcer, I have adopted the following plan:—A piece of jaconet, sufficient in size to be held tightly around the limb, is dipped in some 1 in 2,000 bichloride of mercury solution, and then placed with its non-glazed side over the ulcer and surrounding parts. The smooth surface is dried, and a small quantity of vaseline smeared upon it. The palmar surface of the hand is by this means permitted to pass easily over the ulcer, and thus admit of its being massaged like the surrounding parts.

While the immediate result of this treatment has in every way proved good, I believe its more remote effects will be found to be equally valuable, for the cicatrix of an ulcer that has been massaged is seen to be well vascularised, and therefore much less likely to break down than when the ulcer has sluggishly skinned over. Further, it is a treatment which can and should be continued by the patient, so as to maintain the parts in a healthy condition.

Where these ulcers are associated with varicose veins, such veins ought to be exercised; and thus a potent factor in the cause of the passive engorgement of the part removed.

The only other operative procedure (with the exception of skin grafting) which is sometimes of service is to dissect up a flap from the immediate neighbourhood of the ulcer, twist it round over and on to the freshened surface and edges of the sore. As with skin grafting, this should be done when the ulcer is healing. For by this time the massaging of the part has revivified the floor of the ulcer, and rendered healthier and more active the skin around.

With regard to the fourth requirement, the removal of all deleterious exciting influences from the surface of the ulcer, this simply means the cleansing of the ulcer from all septic matter.
After each daily massage the ulcer is washed with some 1 in 2,000 bichloride; a piece of boracic lint about the size of the ulcer is dipped in the same solution, placed on the sore, and covered with a piece of gutta percha tissue. This, as a rule, constitutes the sole kind of dressing used, with the exception that, as the ulcer heals, the mercury solution is changed for boracic acid lotion.

The result of this treatment is best told by the few cases which I now give in illustration.

**Fig. 1 (Natural Size).—**The respective outlines show per week the rate of progress of healing during the earlier stages. (a) The grafts; (b) the size of the ulcer the week after application of the grafts.

**Case I.**—P. M., aged 49, a labourer, was admitted on 2nd December, 1890, with an ulcer on the inner side of the left leg, a little above the ankle. It commenced twenty years ago, and since then had never healed. The report states—in the position above indicated—"There is a large callous ulcer of size and shape shown in the figure (Fig. 1). The edges are thick and indurated. The floor is pale, and presents longi-
tudinal bands of fibrous tissue. The surrounding skin is hard and tense, with congested vessels."

3rd December.—Massage first applied.
4th December.—To-day very great improvement is seen in the appearance of the ulcer. In the floor healthy granulations have formed at different parts, while the floor itself is very clean. The edges at certain points present a distinct healing margin.

10th January.—Four grafts were taken off the arm and planted on the ulcer (Fig. 1, a).
12th January.—All the grafts have taken.
16th January.—The skin edges are rapidly approaching the grafts.
2nd March.—Dismissed cured.

![Diagram](image)

**Fig. 2 (Natural Size).**—The respective outlines show per week the rate of progress of healing during the earlier stages.

Case II.—A. M., aged 47, an engine fitter, was admitted into the Victoria Infirmary on 16th February, 1891, with a
chronic ulcer. The skin gave way about five years ago, and since that time he has been troubled with the ulcer.

About 2 inches above the external malleolus on the left leg a large irregular callous-looking ulcer is seen, of the size and shape shown in Fig. 2. The edges are firm and heaped up; no healing line is visible, and there is no tendency to heal. The floor of the ulcer is pale and fibrous-looking, with no indication of granulations. The skin around is much discoloured, extremely indurated and tense, and the bone is much thickened by periosteal deposit. There is varicosity of the veins.

17th February.—Massage commenced.

24th February.—The floor of the ulcer now shows healthy granulations, and the rigid edges are rapidly disappearing.

1st March.—Ulcer now a healthy healing sore. The skin around is becoming pliable, and can be moved on the bone beneath. The great periosteal thickening of the fibula is now easily felt.

23rd March.—Dismissed for insubordination.

Case III.—J. M., aged 67, a labourer, was admitted into the Victoria Infirmary on 12th February, 1891, with a large chronic ulcer. Twelve years ago he got his leg jammed between the buffers of two wagons, which led to the formation of an ulcer about the size of a florin. This healed, but 5 years ago the scar was injured, and the ulcer reopened. It again healed, and remained so till six months ago, when he scratched the scar, and an ulcer formed which gradually increased in size.

The ulcer is situated on the outer side of the right leg and ankle, and is in shape and size as represented in Fig. 3. The edges are thick, heaped up, indurated, and callous, with no sign of a healing margin. The floor of the ulcer is uneven, and devoid of any healthy granulations. The skin around, for a considerable extent, is swollen and dull red in appearance. There is a large quantity of discharge. Slight varicosity of the veins.

13th February.—Massage commenced.

21st February.—The ulcer has greatly improved. The hardened edges are fast disappearing, and several small islets of skin are faintly seen on the floor of the ulcer.

21st March.—Three small grafts were removed from the arm and applied to the surface of the sore.

28th March.—Massage was discontinued after the grafts were applied. As a consequence the ulcer at once lost its healthy appearance, and became callous-looking. The result
has been that the grafts have not taken, and the ulcer is larger than it was a week ago. Massage recommenced.

2nd April.—The ulcer already is greatly improved.

30th April.—Ulcer almost healed. The cicatrix already formed is firm, and presents a well marked vascular appearance.

Fig. 3 (Natural Size).—The respective outlines show per week the rate of progress of healing during the earlier stages.

Remarks.—I might give other cases similarly illustrative of the value of the treatment. These, however, are sufficient to indicate the special results obtained, and I may in conclusion tabulate them thus:—

No. 1.
1. Improvement shows itself at once, and is most marked during the first week or two. The heaped up skin edges begin to disappear, and a sloping healing blue line is observed. The floor of the ulcer soon shows healthy granulations. The surrounding skin becomes early whitened or mottled, indicating the complete emptying of the congested venules.

2. Later, the skin around becomes more pliable, and can be pinched up and freely moved on the underlying tissues.

3. The cicatrix forms a well-organized, and thus less liable to break down.

4. The treatment can be carried out by a nurse or by the patient's friends, and the massaging should be continued after healing has taken place, in order to maintain the skin and soft parts in a healthy condition.

CURRENT TOPICS.

THE BRITISH INSTITUTE OF PREVENTIVE MEDICINE—
DEPUTATION TO THE PRESIDENT OF THE BOARD OF TRADE.—
On Friday, 5th June last, in the banqueting hall of the Hotel Victoria, Northumberland Avenue, Sir Michael Hicks Beach received what was probably one of the largest deputations that ever waited upon a British Minister of State. The occasion of the deputation was the refusal of the Board of Trade to incorporate the British Institute of Preventive Medicine, omitting the word "Limited," a refusal which had been mainly brought about by the efforts of that well-meaning but, in our view, mistaken section of the general public—the anti-vivisectionists. The deputation was attended by gentlemen from all parts of the country, and the Glasgow School was represented by Dr. John Lindsay Steven. The speeches of Sir Joseph Lister, Sir Henry Roscoe, and the other gentlemen who acted as spokesmen of the deputation, as well as the reply of Sir Michael Hicks Beach, are reported in full in the British Medical Journal, 13th June, 1891, at page 1,300, so that we need not further refer to them here. We were able to learn, however, that there is every likelihood of the British Institute of Preventive Medicine obtaining its licence, and we confess that we have difficulty in seeing how the Board of Trade can persist in refusing it in the face of what Sir Joseph Lister termed "the mass of educated opinion represented by the deputation." In all, about 150 gentlemen of all shades of
Current Topics.

scientific and medical opinion attended, so that there was not accommodation at the Board of Trade Offices to receive them; hence the reason of the reception being in the Hotel Victoria, an almost unprecedented circumstance, we should think, in the history of deputations to the Government Departments. We have also heard a rumour that a movement is on foot in certain quarters to have the Institute located in Cambridge. We think that this would be a great mistake. A National Institution, such as the British Institute of Preventive Medicine, must be located in the Metropolis, and not in the provinces.

The Royal British Nurses' Association.—The incorporation of this association by the Board of Trade, omitting the word "Limited," is a matter which, at the present time, is exciting much interest and controversy in certain sections of the medical world. The association, under Clause 8 of the memorandum, proposes "to form, control, and carry on (1) a register of trained nurses; (2) a register of certificated midwives, and to determine from time to time what tests shall be specified by candidates for registration, as evidence that they possess skill and knowledge in their profession." This is the clause that has excited very strong opposition, and the petition of a number of well-known and influential physicians and surgeons has been presented to the President of the Board of Trade praying that the application be not granted. We have no wish to discuss the pros and cons of the controversy, nor have we any desire to examine critically the motives which may underlie the action of each of the contending parties, but we feel impelled to give utterance to our very strong conviction that the more mere professionalism is introduced into our trained nursing, the more is the quality of that nursing likely to deteriorate, and the more is the public likely to be inefficiently served in this important matter. Of all human occupations, that of the sick nurse is the one most likely to deteriorate most rapidly and seriously under the cool, calculating, worldly influences of the purely professional—or we might say trades-union spirit. The worth of a very large portion of a nurse's work cannot be estimated in money value, and the services she renders cannot be reckoned as mere skilled labour. We firmly believe that there are many women capable of undergoing the necessary training, and of passing with distinction the most severe examinations, who, constitutionally, are quite incapable of fulfilling the duties of a sick nurse, and who would necessarily find a place on a
register such as that of the Royal British Nurses' Association. In saying this, we are not speaking of "certificated nurses who prove unworthy of trust, or who have even perhaps been convicted of crime," but we have in our mind women of the highest intellectual power and the soundest moral principle. We think that the efforts which are now being made in many quarters with the object of raising nursing "to a distinct profession, with its entrance examination, its minimum requirements, theoretical and practical, its teachers, its examiners, and its diplomas," is a very great mistake. We therefore hope that the opponents of the Royal British Nurses' Association may be successful in their efforts, notwithstanding the fact that we thus range ourselves on the side of those despised, but at same time honest and manly men, who have "sufficient integrity to be trusted with money, sufficient knowledge of figures to understand the accounts, and, generally speaking, some uncertainty as to the use of aspirates." Our readers will form their own opinion of the good taste of this sneer, which we have quoted from a letter of the leaders of the Association, in the Times of the 27th May last, at the managers of our great public charities.

NEW PREPARATIONS, DRUGS, &C.—The Liquor Carnis Company have issued a new preparation which they call Malto-Carnis c Cocoa, which is a combination of the three substances indicated in the name. It is prepared for use in precisely the same way as ordinary cocoa. We have tried the preparation, and find it very nourishing and palatable. We have quite recently been informed that this preparation is now known as Malto-Carnis (Caffyn).

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REVIEWs.


The volume before us, which consists of fifty-four pages, with sixteen maps, is reprinted from the Proceedings of the Royal Society of Edinburgh, and the author lays no claim as to an
exhaustive treatise on the subject, but states that it is the
outcome of notes prepared for lectures to his students, and is
only a preliminary attempt to focus our present knowledge of
the geographical distribution of some tropical diseases, and to
indicate, as far as possible, the knowledge which we at present
possess of those physical phenomena which influence the pro-
duction of these diseases and the area of their distribution.

The diseases treated of are:—(1) Malaria, (2) Dengue, (3)
Asiatic Cholera, (4) Yellow Fever, (5) Oriental Boil, (6)
Endemic Hæmaturia, (7) Beri-beri, (8) Oriental Plague, (9)
Dysentery, (10) Leprosy (Elephantiasis Greecorum), (11) Yaws,
(12) Fungus Diseases of India, (13) Elephantiasis Arabum
(Barbadoes Leg), (14) Guinea Worm, (15) Filaria Sanguinis
Hominis, (16) Scurvy), (17) Tropical Abscess of the Liver.

In the introductory chapter our author states that he has
taken "the definition and description of each disease from the
Dictionary of Medicine, edited by Richard Quain, M.D.,
because the definitions and descriptions there given are the
generally accepted ones; and, in a paper of this character,
which deals more or less with broad outlines and general
facts, it would be out of place to enter into any personal
views I may have as to either the cause, the definition, or
the description of the disease referred to.

"With regard to the data concerning the geographical dis-
tribution of the diseases, I am indebted for my principal facts
to the Handbook of Geographical and Historical Pathology,
by Dr. August Hirsch, and to the copious bibliography which
accompanies his various chapters. I have not, however,
hesitated in any case where my own information, or informa-
tion gathered from other sources, modifies or supplements his
data, to make use of the same; and I have, as far as possible,
verified the facts I have given."

The geographical distribution of tropical diseases, and their
relation to physical phenomena, is a very wide subject, and
cannot be discussed, even in the most condensed form, within
the narrow limits of fifty-four pages. Our author has had
considerable personal experience and opportunities for observa-
tion in Central tropical Africa; but not much original matter
is added to our information on the diseases of tropical Africa.
It would, for example, have been extremely interesting had
our author given us some information as to the extension, in
Central Africa, of the great cholera epidemic of 1865; but not
a word is said on the subject, and the whole subject of cholera
is discussed in four pages. The subject of dengue is discussed
in two pages; and in it our author says that the period of
incubation is probably about six days, that summer and early autumn are undoubtedly the dengue season, and that it appears to depend on a high temperature for its production. He also states that, as a rule, it is chiefly confined to coast districts, to the courses of great rivers, and to places having a low altitude. These are simply second hand quotations, and of no value whatever.

All that can be said regarding the treatise is that it is an extremely condensed paper of some parts of Hirsch’s great work on *Geographical and Historical Pathology*. It may be of some use to the medical student attending a course of lectures on the subject; but to those seeking information as to the distribution of tropical diseases and their etiology, not much information is afforded. The book, however, is well illustrated by the sixteen maps, which constitutes the most valuable portion thereof; but maps are of doubtful value, and are very frequently imperfect and misleading, their chief value consisting in the indication of endemic areas.

A work on such a subject, to be of any value, must be an expansion, and not a condensation, of Hirsch’s great work, as the work of Hirsch is itself in a very condensed form, and is by no means exhaustive, more especially as regards chronology and the origin and distribution of epidemics.

We are of opinion that Dr. Felkin has rushed somewhat prematurely into print on the subject of tropical diseases.


The manual before us has been prepared as an introduction to the author’s larger and more advanced work on hygiene, and is specially adapted to the requirements of the elementary stage in hygiene of the Science and Art Department.

Cleanliness, Treatment of Slight Wounds and Accidents. The book is well illustrated by sixty-nine diagrams; and, at the close of the various chapters, there are details regarding experiments, and questions set in the various elementary science examinations.

The name of the distinguished author of *Hygiene, School Hygiene,* and *The Elements of Vital Statistics* is a sufficient guarantee for the excellence and completeness of anything which may proceed from his pen, and the short treatise before us is an illustration thereof. Personal hygiene is the outcome of physiology, and, to some extent, of pathology; so that, in order to a full comprehension of the subject, a knowledge of the elementary principles of physiology and physiological chemistry is absolutely necessary.

As already indicated, the work before us is not intended for the use of medical men, nor of those who have studied physiology and chemistry at our universities or medical schools, but for those who have had no previous teaching on the subject, and for advanced scholars going up for their examinations in the Science Department.

The science of physiology proper is discussed in the first eighty-four pages, and we cannot but admire the completeness with which the leading and fundamental principles of physiology are compassed within such narrow limits.

The remaining portion of the book is devoted to personal hygiene, including, of course, the leading principles of public health as regards water supply, ventilation, &c.; but questions relating to infectious diseases, disposal of sewage, &c., are not discussed in the present volume.

Like the chapters on physiology, those on personal hygiene are remarkable for their condensation and completeness, and may be profitably studied by all.

Regarding water supply, our author says:—"Rain-water may form a valuable source of drinking water under proper safeguards. It is very soft, and therefore economical for washing purposes, and is always well aërated. It may be contaminated, however (a) by washing down soot and various noxious gases from the air of towns; (b) by running over dirty roofs and carrying with it the excrement of birds and other impurities, as well as possibly dissolving lead from lead pipes; and (c) by being kept in foul water-buts. Appliances are sold (as Roberts' percolator), by which the first, and therefore dirtiest, portion of rain-water from roofs is rejected, only the clean rain-water which follows being collected for future use. If it is also ensured that no lead has come in contact
with the water, rain-water forms a useful source of drinking water, and is much preferable to the water found in shallow wells.” . . . “Where surface wells must be used, the water should only be admitted from the lowest point of the well, the walls of the well being made water-tight. No cesspools should be allowed within 20 or 30 yards of the well (it is doubtful if this limit is sufficient), and the water should be always boiled before drinking. Occasionally, even deep wells have been contaminated from cesspools, when cracks or fissures exist in the strata of soil. If much pumping is done, a well may drain the soil from distances amounting, in some instances, to a mile.”

Our author also states, what has long been well known, that “contamination of water with sewage or other animal matters may give rise to diarrhœa. When the sewage contamination contains the specific poison of this disease, enteric or typhoid fever has been frequently traced to polluted water. This water may have been derived from a surface well situated in a farm-yard, which also contains a large manure heap and a privy, whose contents soak towards the well, especially after a heavy fall of rain. In large villages or towns, where the refuse matters are kept in midden-heaps or privies, or in cesspools dug in the ground, which allow of soakage in every direction, and when at the same time wells are dug in the neighbouring soil, the danger of the contamination causing typhoid fever is greatly increased.”

There can be no doubt that cities, large towns, and even small towns and villages should have a gravitation water supply of unquestionable purity, though in the case of some small towns or villages this is not practicable except at great expense. But, in every case, the use of surface and shallow wells, and even of deep wells, in the immediate vicinity of dwelling-houses should be emphatically condemned as being injurious to personal and public health, and altogether unnecessary.

We wish that our author had dealt more fully, and spoken more emphatically, as regards the necessity for utilising rain-water in small villages, isolated houses in rural districts, and also in farm-steadings, and especially in dairy farms. The annual rainfall, collected from slated roofs, and stored in cemented tanks, adapted with filters, would be amply sufficient for the use of the household or the farm-steading, and the water thus obtained would be of the best quality and absolutely free from the possibility of pollution. But rain-water collected from roofs, and allowed to run off at all times into
water-butts, is a system to be condemned as almost as bad as the shallow wells, and quite inadequate for a continuous supply. It is a matter of regret that the proper collection and storage of rain-water, nature’s own distillation, is so completely ignored in this country.

The chapters on Air and Ventilation are very complete, and contain, in a condensed form, much valuable information.

Dr. Newsholme’s manual on Lessons on Health is a valuable contribution on the subject, and is well adapted for the use of the science student, and the public generally who are, or ought to be, interested in such matters.


The introduction to this work opens with the trite remark that there is no satisfactory simple name for that branch of medicine of which the medical officer of health is the official representative. And, beyond the difficulty in nomenclature, there is the practical one of dealing in one volume with the widely varied subjects upon which the science of public health rests. This is the task which Dr. Whitelegge has undertaken in the present volume; and, with the limited space at his disposal, it will be admitted that he has at all times succeeded in presenting a vivid outline of much that is known on the subject, while there is much in the volume that is more than this. Indeed, were one inclined to be at all querulous, it would only be in the direction of taking exception to the endeavour to compress, within the limits of a manual of this size, anything approaching a complete system of hygiene. Condensation becomes an inelastic necessity, and there is no place for detail. This is especially true of chemical and bacteriological investigation, and the omission of what may be the merest commonplaces of the laboratory perforce send the student, if he be fresh to the subject, to some larger, if less comprehensive treatise. In the volume before us Dr. Whitelegge has, however, amply compensated such omissions by carefully indicating how the results of those investigations are to be interpreted in relation to questions affecting health; and the chapters which deal with air, water, soil, and food present, in an epitomised form, our most recent knowledge regarding them.
The chapter on Disinfection is good, although the section on fumigation reflects the uncertainty which still surrounds its practical application. We wonder how often chloride of lime and hydrochloric acid are used in the proportions required by Koch's experiments, as here stated—viz., 15 and 22 lb. respectively for each 1,000 cubic feet of air space. Then, again, the old quantity of sulphur is still retained—viz., 1 lb. (= 1.1 per cent $SO_2$) per 1,000 cubic feet of space. In America, and we think also in the Children's Hospital of our own city, three times that amount has been found to be more reliable.

To the treatment of Vital Statistics special attention has been devoted, and the various terms used therein are defined in a manner which will render the subject interesting and instructive to those unacquainted with the larger works on the subject.

The chapter on Sanitary Law deals exclusively with the statutes affecting England.

Throughout the work, as a whole, there is constant evidence of a thoughtful and successful endeavour to present the subject so that even the most hurried reference to its pages will not be fruitless. But there is a lack of proportion between the subject and the book, which is not, we think, to be commended.

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If there is a pleasure in hearing Sir James Paget speak, there is no less pleasure in reading what he writes. That same happy fluency of diction accompanies his pen as it does his voice. It would, however, be a poor compliment to pay to the present work to speak of it other than as a valuable contribution to the subject of which he is so experienced a master and so able an exponent. Sir James Paget stands out pre-eminently as one of the greatest living clinicians. No case passes beneath his notice that he fails to evince any and every point of interest connected with it. He has often inculcated the principle that to be a good surgeon a man must be a good anatomist and a good pathologist. No better practical example of such a principle exists than the exponent himself. It is the striking feature in all his writings, and explains alike the keenness of his observations, the accuracy of his diagnoses, and the correctness of his explanations.

In reading, then, the present work, one will not fail to
be struck by this threefold attribute—new facts are given, their method of diagnosis shown, and their probable causes explained.

While the book is called a study of old case-books, it will be found to be illustrated but sparsely with old cases, and to deal more extensively with matter of much later date. Sir James Paget's wide reputation entails his being frequently consulted for rare and obscure affections. It is with some of these less commonly met with injuries and diseases that the present work chiefly deals; such, for instance, as are not to be found described in the ordinary text-books. To every surgeon, therefore, the book must prove of much value, and to every practitioner it cannot be without interest.

The work is beyond criticism, and must be read as much for the actual instruction in new matter which it contains, as for the many varied trains of thought and suggestion with which it abounds.


The sixth edition of this work calls for no special remark, except that the author has secured the services of D. G. F. Crooke for the Section of General Pathology, and of Mr. Malcolm Muir for that on Diseases of the Skin. It is one of the best books of its kind, but the kind is not a very good or satisfactory kind.


The authoress gives the usual historical and bibliographical account of the method. She describes the technique of the manipulations, and gives the opinions and results of other workers in this field. She herself describes in detail thirteen cases. She sums up her "conclusions" by stating that the most constant result is the amelioration of the general condition; next to this, hæmorrhage is usually arrested; the pains are diminished often, but not so constantly as the arrest of hæmorrhage. The tumours usually diminish in size, and occasionally disappear. These results are usually permanent. As in most French works, a large bibliography is appended.
MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

SESSION 1890-91.
MEETING XII.—6TH MARCH, 1891.

DR. HECTOR C. CAMERON, Vice-President, Surgical Section, in the Chair.

I.—NOTES ON A CASE OF SENILE GANGRENE.

BY DR. DAVID LINDSAY.

Dr. David Lindsay, Hamilton, read the following notes of a case of senile gangrene:

The case to which these notes refer was a protracted one, and I shall merely mention the main features in so far as they may appear necessary.

The patient was a man seventy-eight years of age. I saw him first in November, 1888. He was of a very sensitive disposition, and it was with difficulty I could learn much regarding his previous history; but I think we may fairly conclude that he developed into manhood with a vigorous constitution, and that the regularity and activity of his life in no way conduced to premature decay in his constitution. At the advanced period of life, however, when he first came under my observation, he had fatty degeneration of the heart, and the blood-vessels were distinctly atheromatous. He had at one time suffered from a large abscess in connection with the vertebrae, and he had antero-posterior spinal curvature. A year or two before I saw him he had fracture of the right arm from a fall, which united in the usual time.

It is his right leg, however, with which we are especially concerned. There the nutrition was apparently more defective than in other parts of his system. From the knee downwards he lacked the normal sensibility. He was subject there to severe commanding pain, neuralgic in character, occurring at uncertain intervals. He also suffered from tingling and numbness. The right foot became the seat of gangrene. On examination I found a sore on the heel, the size of a florin, implicating merely the skin; the foot itself was cold and very much discoloured, especially the toes, which
were livid, deep purple, and altogether as if the foot was in a state of incipient senile gangrene. He was put to bed, the sore dressed with carbolised glycerine, and the foot and leg wrapped in cotton wool. The discolouration of the foot lasted some time, but gradually the temperature became normal, and the foot regained its natural colour. The sore on the heel enlarged until it was several inches across, and sloughs separated for a considerable time, implicating the skin and subcutaneous tissues. After a time it began to heal, and ultimately it healed completely. He got up daily, and could limp across the floor, dragging the right foot.

In May, 1889, I was asked to see him one day, as his nurse thought there was something the matter with his leg. I found complete fracture of both bones of the right leg, at the junction of the middle and lower thirds. He did not know of this occurring; he felt no pain, and it must have been at least a day before his nurse noticed it. It was carefully put up in splints, and he was kept in bed. At the end of four weeks firm union had occurred, as indicated by handling, and it never troubled him afterwards; indeed, it never troubled him at all for that matter, even when the fracture was being adjusted.

A few months afterwards the heel again became affected; the sloughs this time were more extensive; the tendo Achilles was involved, one half of its entire thickness sloughing off. The same treatment was adopted, and, after a tedious progress, the sloughs extending into the sole of the foot, the healing process was again initiated, and ultimately the sore healed completely, and the skin never again became affected there.

The further progress of the case may be briefly stated. From a series of domestic afflictions he became very much depressed; first one bedsore formed, then another, and he ultimately died in November, 1890.

The points of interest in this case appear to be (1) the occurrence of gangrene of the foot, the healing of the gangrenous sore, its recurrence and subsequent permanent healing; (2) the fracture of both bones of the leg from an unrecognised cause and unknown to the patient, the speedy union of the fractured bones; (3) the recurrence of bedsores coincident with his generally depressed condition terminating in his death.

Dr. Barlow expressed the opinion that the case recorded by Dr. Lindsay could scarcely be regarded as one of senile gangrene. There was gangrene in an old man; but, in the
position of the slough and in the symptoms, there were important departures from the conditions associated with senile gangrene. He was disposed to regard it as a gangrene due to nerve lesion, and consequent interference with nutrition of the foot. From the history as given there was loss of sensibility in the limb, associated with periodic attacks of "neuralgic" pain, and tingling and numbness were present. Then there was a fracture of both bones of the leg occurring unconsciously, or at least unattended with pain at time of production and during the application of splints. The position of the slough and the course of the disease resembled very closely that of a perforating ulcer, or of a bedsore accompanying a spinal lesion, and from the history we find that bedsores subsequently formed in other positions.

Dr. Cameron thought that while "flying pains" were common in the condition called senile gangrene, Dr. Lindsay's case was to be regarded as one of ulceration due to nerve lesions. Referring to the spontaneous fracture and the speedy union of the fragments, Dr. Cameron had noted the same injury and result in a case of tertiary syphilis.

II.—NOTES OF A CASE OF RUPTURE OF THE BLADDER.

By Dr. Dalziel.

Dr. Dalziel read notes of a case of rupture of the bladder sutured on the third day after receipt of injury, in which death occurred two months afterwards from septicæmia and suppuration along lines of comminuted fracture of pelvis.

Mr. Maylard.—There were three points specially worthy of note in Dr. Dalziel's case. (1) The ruptured bladder; (2) the fractured pelvis; and (3) the abscess in the prostate. With regard to the first, it was somewhat difficult to conceive that the rupture had resulted from the lateral pressure which had fractured the pelvis. The pelvis, although comminuted, still retained its shape perfectly, which could hardly have been the case if the bones had been driven in sufficiently to compress the distended bladder. Regarding the nature of the fracture, it was a somewhat uncommon one, and was of much interest from the little displacement that existed, notwithstanding the numerous fragments which were seen to be detached, but in position. The abscess of the prostate was an unfortunate complication in the case, and its existence seemed to indicate that perineal section at the time of the laparotomy might have been performed with advantage. In any case, Mr. Maylard felt that for efficient drainage he
would have been inclined to have performed perineal section in preference to retaining in the bladder a catheter. The case recalled to his memory two cases that he had recently under his charge in the Victoria Infirmary. Both, however, were cases of extra-peritoneal rupture of the bladder. In these the bladder was punctured by the displaced fragments of the fractured pelvis. From the experience gained in the first case, he, in the second, performed perineal section, and opened a very fœtid abscess that had formed in front of the bladder and pointed above the pubes. Both cases, unfortunately, ended fatally, death being due to septic influences, the result of extravasation into the cellular tissue around the neck of the bladder.

III.—Dr. DALZIEL showed a patient in whom he had performed resection of tarsus for paralytic talipes valgus.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

SESSION 1890-91.

MEETING VII.—20TH APRIL, 1891.

The President, David Newman, M.D., in the Chair.

I.—CHRONIC INTESTINAL OBSTRUCTION.

BY DR. JOHN LINDSAY STEVEN.

Dr. John Lindsay Steven showed the parts (fresh) from a case which had been under the care of Dr. Samson Gemmell and Mr. H. E. Clark in the Royal Infirmary. The patient (female) had never had complete obstruction, passing from time to time motions with a flattened, ribbon-like appearance, as if from constriction low down. An exploratory operation, a month before death, found the bowels much matted together, and right lumbar colotomy was done. Post-mortem examination showed the obstruction to be due to matting of coils of the ileum in the pelvis. The artificial anus, that is to say, was below the seat of obstruction.

[Since the date of the meeting a careful dissection of the mass had been made by Dr. J. K. Kelly, and the appendix was found to be in every respect quite normal.—J. L. S.]

Dr. Kelly had examined the pelvic organs and had found
no explanation of the peritonitis there. He suggested that
the initial lesion had probably been an appendicitis.

*Dr. Finlayson* thought it extremely unlikely that an
obstruction in the situation shown by Dr. Steven would
cause narrowing of the faecal masses. His impression was
that such narrowing occurs only when the obstruction is
lower down, and in the present case would attribute it to
pressure on the rectum by the adherent coils as a mass. He
had often been astonished to find the bowel thus matted in
cases of tubercular peritonitis. He did not consider the
condition here to be of tubercular origin.

*Dr. Lindsay Steven* thought Dr. Finlayson's explanation
of the narrowing of the faecal masses quite a probable one,
but mentioned (as against it) the fact that in the rectum
he had found a mass of white and dried faeces which he
supposed had been there a long time, and which was not
flattened.

**II.—ADDISON'S DISEASE.**

**BY DR. ALEX. NAPIER.**

Dr. Napier showed one supra-renal body much enlarged,
and with appearances suggestive of haemorrhage, from a case
which he had been inclined to regard as one of Addison's
disease.

A full account of this case will appear in the *Glasgow
Medical Journal* in separate form.

*Dr. Napier*, in reply to Dr. R. M. Buchanan, stated that
the supra-renal capsule affected was adherent only to the
under-surface of the liver. The semilunar ganglia had not
been specially examined. The other supra-renal capsule was
normal.

*Dr. Alex. Robertson* said that, so far as he could remember,
in the morbus Addisonii it is the rule that both capsules are
affected. Still, the staining of the skin was of the usual
type, except that there does not seem to have been in Dr.
Napier's case the specially deep staining of the face and of
the backs of the hands. He noticed, too, that pigmentary
matter had been found in the abdominal cavity in this case;
as to the significance of this, there is some difference of
opinion. He himself had examined the vagina in a case
presenting the ordinary pigmentary changes elsewhere (in-
cluding the buccal mucous membrane, &c.), and found none
there.

As regards the changes in the supra-renal capsules, he had
observed in the cases which he had examined, in the earliest
stages, gray degeneration, in a further stage yellowish points scattered through this, later still the capsules entirely yellowish, and in the last stage wasting of the supra-renal so marked that it was difficult to find the capsules at all; this might be represented by mere fibrous bands. He remembered a case he had seen some years ago, in which matting of the supra-renal extended up to the semilunar ganglia, and this would correspond with the pathological view of the disease as one essentially of the sympathetic nervous system.

The interest in Dr. Napier's case he considered to be the finding of a structure in a supra-renal capsule so different from what is usually found in the morbis Addisonii, and yet to have the staining of the skin so like. But it was to be remembered that staining of the skin occurs in many cases apart altogether from disease of the supra-renal, and that, in fact, further inquiries are necessary as to its causes.

Mr. Maylard asked if hemorrhage into the supra-renal occurred in Addison's disease. The naked eye appearance of the specimen suggested haemorrhage very strongly.

Dr. Finlayson thought it quite apart from cases of Addison's disease, that one found such a distinct swelling of one supra-renal capsule and not of the other. This has not been recorded in the typical cases. So far as he had seen in the early stage, there is grey, almost translucent change, and in the more advanced stages yellowish cheesy changes.

The emaciation in Dr. Napier's case is too extreme to be quite in accord with Addison's disease, in which, indeed, there is emaciation, but slight as compared, for example, with that occurring in malignant disease. Such pigmented spots as Dr. Napier describes are not usually found in the mesentery in Addison's disease. He presumed there were no nodules at these points?

Dr. Napier. No.

Dr. R. M. Buchanan remarked on the irregularity of the pigmentation—its patchy nature; this was not as generally recorded. He asked if it had any relation to nerve distribution. What was the nature of the nodules in the liver? The case was of interest in so far as it presented the symptoms of Addison's disease, but not the usual lesion.

In connection with the injection of Koch's fluid, he referred to two cases in which reaction took place. There was rise of temperature and pain in the region of the supra-renal capsules. No good had resulted from the treatment.

The adhesions of the lungs posteriorly was of importance. Such adhesions occur, of course, very frequently, but here
they may have involved the splanchnic nerve, and that may have had some share in producing the patient's malady. In a case which he had recently seen, the splanchnic nerves were completely involved in connective-tissue.

Dr. Newman hoped that Dr. Napier would further investigate the condition of the supra-renal capsule shown by microscopic examination.

Dr. Napier, in reply to Dr. Buchanan, said that the bands of pigmentation ran longitudinally, and not in any special relation to the distribution of nerves.

III.—APPENDICITIS—REMOVAL OF APPENDIX FOR RECURRING ATTACKS.

By Dr. Alex. Napier and Mr. Maylard.

G. G., an unusually well developed and healthy-looking young man of 21, suffered from four attacks of what was regarded as recurrent appendicitis within ten months. Two of these attacks were so severe as apparently to threaten life; two were much milder.

The first attack began on 4th June, 1889, lasted only a few days, and was subdued by rest and a few doses of an opiate. The symptoms were constipation, coated tongue, pain in right iliac fossa, tenderness to pressure in same region, a slight degree of abdominal distension, and slightly elevated temperature.

The second attack began on 14th June, 1889, after a sharp game at lawn tennis. It was a very severe seizure; the temperature ran up to and over 103° F., the pulse was rapid, and vomiting was continuous for several days; there was marked constipation, a coated tongue, universal abdominal distension, tenderness, and tympanitic percussion-note. Pain and tenderness in right iliac fossa were most acute.

Patient, after being seriously ill for nearly a week, gradually recovered as before, being treated by rest, opiates, poultices, and limited diet.

On 7th October, 1889, a third attack occurred, again a very severe one, after some indiscretion in the way of exercise. Patient presented the same symptoms as before, and recovered under similar treatment. On this occasion prolonged rest in bed was insisted on, even after the symptoms had subsided.

On 2nd April, 1890, the fourth attack began. It was less severe than the last two, but was marked by exactly the same general symptoms.

This lad had now suffered from four attacks of appendicitis
within a comparatively short period; the loss of time, to say nothing of danger to life, had been serious; he was forbidden to take exercise, or to lift or carry heavy weights; and in general he felt his life and business activity so hampered by these restrictions and the sense of impending danger, that he readily fell in with my proposal that a surgeon should be seen, in order that, if thought prudent, some operative procedure might be attempted, with the view of obtaining a radical cure and preventing further attacks.

Mr. Maylard described the operation which he had performed in this case, with the assistance of Dr. Rutherford, for removal of the appendix. The appendix was found much distended and deeply attached. In removing it there were considerable adhesions, both firm and slight; and a good deal of oozing took place on their severance. The wound healed by primary union, and the patient was allowed to get about after a month’s confinement. It was now a year since the operation, and the patient had been in perfect health ever since.

Mr. Maylard, in his remarks upon the case, said he thought it one of considerable interest when so much was now being discussed, both in this country and in America, as to the surgical treatment of this class of diseases. It can only be said to be in recent years that these cases have come so prominently before the surgeon. Hitherto these had been considered as cases to be dealt with more by the physician than the surgeon. But the consensus of opinion now was to hand them over at the earliest possible date to the surgeon, not necessarily for operation, but to allow of an operation being performed at the earliest possible date should it be thought expedient to do so. The case was one type of this particular disease—the type of that class which includes all cases of recurrent appendicitis. The question was whether the removal of the appendix was the proper treatment. Would this or these classes of cases ultimately remain perfectly quiescent, or might an attack occur which would lead to serious, if not fatal consequences? In this particular case any over-exertion led to an attack, and in a strong athletic young fellow, such as the patient, it seemed only too likely that serious results might have accrued in the future if the appendix were not removed.

Dr. Robertson thought the operation in this case quite justifiable, but it was a difficult question to settle after how many attacks it should be performed.

Dr. Finlayson said that Dr. Napier had alleged that one at
least of the attacks seemed to have developed in connection with over-strain. The physician's aim would have been to have removed the possibility of over-strain. Mr. Maylard had said that the appendix was so tense that it had burst. This would cause no risk in such a case as the present one, but in some conditions found in connection with diseased vermiform appendix there would be in this a very formidable risk. Supposing a patient to have become quite well after an attack of appendicitis, he would hesitate very much before sanctioning this operation.

He did not know on what grounds Dr. Napier had made the diagnosis of diseased vermiform appendix. Patients, we know, may have attacks of inflammation in that region, brought on by indiscretions in diet, sometimes by indiscretions in exertion, sometimes without definite cause, and after a time they get better again, without operation.

Mr. Maylard, in answer to Dr. J. Lindsay Steven, said that the appendix was in a catarrhal condition.

Dr. William Macewen said that of course many cases recovered from appendicitis without operation. With regard to operating early, it is to be remembered that there are many cases with a different aspect from this one. Here was a case which had recovered from many attacks, and was in a favourable condition for operating. There are, on the other hand, some in which one finds after twelve hours an extensive and serious peritonitis following on this originally very small disease. In view of this, if a patient has had attacks, and if one can feel something, or if the patient still experiences pain or tenderness on handling, Dr. Macewen would operate. He would not operate if nothing could be felt, even under chloroform, apart from other indications. Within the last year he had seen three cases in which the patients had had threatenings of something amiss in that region for some weeks. In one case there had been these threatenings, and then came a sudden onset of more serious illness, after some jerking movement. Within twelve hours there was intense inflammation—general peritonitis—no doubt due to the bursting of some purulent matter into the peritoneal cavity. The case was operated on, the appendix was found swollen and nearly ulcerated through. The patient died apparently from shock. In the beginning of the year he had had a case of colitis, apparently beginning in appendicitis, in which two feet of the bowel had to be removed. The patient recovered. Operating early is in such cases a good thing. There are some cases in which there would seem to be a specific germ
—the inflammation is so intense and death so rapid (within 24 to 48 hours) without operation, gangrenous patches being sometimes seen. This had occurred in a case in the Royal Infirmary; the patient, a man of strong physique, had within 48 hours taken this form of peritonitis, apparently spreading from the same region. An operation was performed when he was in articulo mortis, and there was seen intense injection of the peritoneum with gangrenous parts, and also a more chronic thickening in the neighbourhood of the vermiform appendix.

Dr. Newman said that the whole tendency of modern surgery is to operate earlier than formerly. It was coming to be recognised that the surgeon should see these cases early. In some discussions it had been asserted that if the physician waits till his diagnosis is complete, it will then be too late.

Dr. Napier, in reply, said that he felt that he had been justified in recommending an operation. The patient's condition had prevented his attending to his work and taking any exercise. He had brought him through four attacks, and had taken him to a surgeon in order to prevent his being exposed to more.

Mr. Maylard agreed with Dr. Macewen as to the different classes of cases of appendicitis. The present case belongs to the type of recurrent appendicitis, but that is only one class. He agreed with Dr. Macewen also in regard to the probability of some cases being connected in their development with the presence of some specific germ.

IV.—THYROTOMY FOR EPITHELIOMA OF LARYNX, AND GASTROSTOMY AND TRACHEOTOMY FOR EPITHELIOMA OF THE ÆSOPHAGUS.

By Dr. David Newman.

These cases have been the subject of special articles in the Glasgow Medical Journal for June, 1891 (see pp. 428, 431).

V.—CYLINDER-CELLED EPITHELIOMA OF UMBILICUS.

By Mr. Maylard.

The specimen shown was excised from the parietes of a man aged 65. He had, two months prior to his admission into the Victoria Infirmary, first felt pain in the lumbar region of his spine, but the small tumour in the region of the umbilicus had not attracted his attention until it was pointed
out to him by his medical attendant. When admitted into the Infirmary a small round projection, about the size of a pea, was seen and felt in the "pit" of the umbilicus. On deeper palpation it was found to be larger to the feel, and to extend into the parietes. It was removed by an elliptical-shaped incision, passing completely through the parietes into the peritoneal cavity. When examined after removal its under or peritoneal surface was pucker. On section it presented a solid appearance, and, when examined microscopically, was found to be a cylinder-celled carcinoma.

Mr. Maylard, in his remarks on the case, said it was one of great rarity, and the nature of the epithelium suggested its possible connection with some remnant of the fetal omphalo-mesenteric duct.

Dr. Macewen had had two similar cases, but when they came under his notice there was already advanced peritoneal disease. In each the primary disease was considered to be a tumour of the umbilicus. In one there had been special complaint of pain in the back, and this was thought to have been probably due to the involvement of the liver found at the post-mortem.

Dr. Lindsay Steven thought that by referring to the transactions of the Society, three or four years ago, Mr. Maylard would find a similar case which had been recorded by Dr. Knox. It was one of alveolar cancer, and had been situated in the skin near the umbilicus. Dr. Knox's opinion had been that that tumour belonged to the endotheliomata. Dr. Steven was not satisfied as to the character of the present specimen.

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

MEDICINE.

By JOHN H. CARSLAW, M.A., M.B., C.M.

Recovery from Tubercular Meningitis.—Recovery from tubercular meningitis is so rare that interest must attach to the account of two cases diagnosed as such, and presented recently to the Société Médicale de l'Elysée.

The first patient was a child of 2½ years, who had been suffering from broncho-pneumonia when the nervous symptoms appeared. This chest affection was presumed to be also of tubercular origin; no very definite hereditary tendency to tubercular disease is recorded, but one cousin had died of meningitis at the age of three. Restlessness with slight strabismus and nystagmus were
the earliest nervous symptoms noticed (26th April, 1890); the rectal temperature was then 39°8 C., and there was considerable respiratory difficulty. It was soon observed that the right hand was very frequently raised to the head, and there developed in succession—intermission—with lessened frequency of the pulse, photophobia, inequality of the pupils, rigidity of the muscles of the neck, convulsions, hydrocephalic cry, contracture of the upper limbs, vomiting and constipation, with retraction of the abdomen, but with no spots and no tenderness on pressure. Further, the child was drowsy, and there was Cheyne-Stokes respiration, but the pulmonary symptoms proper became less marked. No albumen was detected in the urine.

The neck was blistered; an ice-bladder applied to the head and a bromo-iodide mixture given internally. On the 26th April the diagnosis of tubercular meningitis was confirmed by Dr. Hutinel, who advised, in addition to the treatment mentioned, an enema of musk.

Subsequently there was contracture of the lower extremities, and the arms lost their rigidity in part, but became paralysed, though without any loss of sensation. From 30th April onwards the temperature kept about 38° C., but improvement commenced only upon the 15th of May. By the end of June recovery was considered perfect, and the child's health has continued satisfactory since.

Enteric fever is held to be excluded, and the diagnosis of tubercular meningitis to be incontestable.

The second case is that of a female patient of 31 years, who had suffered frequently from headaches and from ill-defined pain in one of her ears—an uncle had died from chest disease. When 24 years of age she was first troubled with a cough, for which she was seen by Charcot, and sent to the country. Three years later, while suffering from tape-worm, she had a sudden attack of blindness, which lasted for a quarter of an hour. She is said not to have been hysterical.

In the winter of 1888-89 she had an illness diagnosed as tubercular laryngitis, but improved under treatment, and kept fairly well till October, 1890, when she had again to seek medical advice, and was then for the first time seen by Dr. Klein. He found her to be very anemic, and to suffer from pains in her head, with occasional vertigo and great depression. She had an obstinate cough, but there were no definitely abnormal physical signs over the apices. (No mention is made of examination of the expectoration). There was a little feverishness in the afternoons, and night sweats were troublesome. On 22nd November she complained much of her head and was restless, and there was vomiting. On the 23rd squinting and diplopia were observed, the patient being perfectly conscious; the pulse was slow and intermittent; there was no pyrexia.

During the following days the symptoms became aggravated; there was rigidity of the muscles of the neck; the left arm became paralysed without any loss of sensation. No abnormality of the urine was detected. The rectal temperature (taken twice daily) was from 37° to 38° C. As regards the abdomen, there was nothing to note except obstinate constipation—no spots and no tenderness. Soon there developed paralysis of the left leg, and there was also vague delirium with some hallucinations, the patient scarcely recognizing her husband.

About the end of November, the left arm appeared to regain some movement, but the right became paralysed, and there began also incontinence of urine. Restlessness was replaced by drowsiness, but that was interrupted by her crying out frequently—"My head! my head!" With the occurrence of the cerebral symptoms the cough had entirely disappeared. The breathing had, however, become of the Cheyne-Stokes character.

About this time Professor Ball saw the patient, and confirmed the diagnosis of tubercular meningitis; he advised the use of calomel in addition to previous treatment, which had included ice to the head, counter-irritants to the nape of the neck and behind the ears, and a bromo-iodide mixture.

For nearly a month there was not much change in the condition. At
Abstracts from Current Medical Literature.

different times attacks of restlessness occurred accompanied by convulsive movements. At the beginning of December there was complete loss of vision, with wide dilatation of the pupils and loss of the pupillary reflex. (Early in the case there had been photophobia, strabismus, with nystagmus at different times.) On the 19th December Dr. Chevalle (ophthalmologist) was called in, and reported the disc (discis?) to be choked—projecting—and of uniform pink colour, with considerable dilatation and sinuosity of the veins, and abundant peri-papillary oedema. He advised an eyewash with strychnine and some application to the temples.

Thereafter improvement began, and the various symptoms gradually disappeared, the eyesight also returning in very great part, so that the patient became again able to read. On March 23rd ophthalmoscopic examination showed the papilla to be very pale, with irregular margin, but without any retinal lesion in the neighbourhood. The veins had lost the swelling and tortuosity. There was considerable narrowing of the visual field on both sides. "The colours" were preserved.

In neither of the two cases was there any suspicion of syphilis.—(La France Médicale, 17th and 24th April.)

Sensory and Vaso-motor Disturbances in cases of Rheumatic Facial Paralysis.—In the K. K. Gesellschaft der Aerzte in Wien, on 19th April, Dr. v. Frankl-Hochwart gave an account of twenty cases of facial paralysis which he had had under his observation. In ten cases there were neither sensory nor vaso-motor disturbances; in two there were both; in five there were sensory; and in three there were vaso-motor. The altered sensibility was in many cases complained of by the patients themselves, and confirmed by examination, including testing of the appreciation of heat and cold. It was never great, and sometimes involved not only the skin, but also the buccal and lingual mucous membrane. The sense of taste was in a few cases likewise diminished. The vaso-motor disturbances gave rise not only to alterations in the colour of the affected side of the face, but also to raising of the temperature of the part.

These disturbances usually manifested themselves with the paralysis, but disappeared after a week or two, the paralysis persisting longer; in one case, however, in which the paralysis was of several years' standing, the loss of sensibility continued.

In explanation of such cases it is assumed that the facial nerve contains vaso-motor and sensory fibres; and, in support of this theory, cases in which herpes accompanies facial paralysis are alluded to as implying that that nerve is supplied with trophic fibres.—(Deut. Med. Zeitung, 30th April, 1891.)

On the Difficulty Experienced in the Diagnosis of Hooping-cough from the Presence of a Tube in the Trachea.—A case illustrating this point is published in the Archives of Pediatrics (April number) by Dr. Finlayson. The patient, a boy 6 years old, was admitted to the Royal Hospital for Sick Children, Glasgow, on 6th November, 1888, suffering from grave laryngeal obstruction, and tracheotomy was performed immediately on admission by Dr. Hector Cameron. A cough, which had been present for the previous fortnight, continued to annoy him; but it was only when the tube was removed (eighteen days after operation) that it was found to present characters which shortly became quite distinctive of hooping-cough. This diagnosis was confirmed, not only by the subsequent progress of the case, but by the occurrence of other cases of hooping-cough at the boy's home. The obstruction had evidently been due to laryngitis, and the presence of the tube had masked the development of the cough.

Determination of the Lower Border of the Liver by Auscultation.—In La France Médicale for 10th April there is a notice of an article on this subject by C. Verstraten, which had appeared in the Centralb. f. Klin. Medicin, 3rd March, 1891. Auscultation is said to be adapted for
cases in which, for any reason, it is impossible to determine the lower border of the liver by palpation and percussion. The patient lies in a reclining posture, with abdominal muscles relaxed; and it is found that the heart’s sounds, as heard through the stethoscope, are transmitted without any appreciable weakening over the whole of the hepatic area, on account of the homogeneity of the liver substance. Whenever one passes beyond the lower margin of the solid organ, however, a very decided weakening is at once noticed. The only difficulties suggested as likely to interfere with this method of examination are (1) the interposition of a portion of the left lung between heart and liver, and (2) a tense condition of the abdominal wall, the latter favouring conduction of the sounds.

Centrifugal Force in Clinical Diagnosis.—In the Verein für Innere Medizin, in Berlin on 20th April, Hr. Litten gave an account of a method which had been devised for the adaptation to clinical medicine of the uses of centrifugal force, which have hitherto been applied only by physiologists. The usual methods of filtering, and of allowing fluids to settle, have often certain manifest disadvantages, and these are thus overcome. Special reference is made to examination of the urine, and the case with which tuberculous bacilli and other micro-organisms, blood-corpuscles, &c., may by this means be detected. It is applicable, also, to the investigation of fluid from echinococcus cysts and of pleural effusions. The advantages with regard to the latter are thus stated:—

"1. Easier demonstration of tuberculous bacilli.
"2. Constant demonstration of blood in clear pleuritic effusions.
"3. Avoidance of the coagulation of the exudation.
"The last is specially important; for, as is known, there are some pleuritic exudations which coagulate immediately, so that microscopic examination of them is impossible. If one warms the glass of the centrifugal machine, and allows the fluid to run into it, and sets it at once in motion, the corpuscular elements are obtained before conglutination occurs."—(Deut. Med. Zeitung, 4th May, 1891.)

Malaria in Children, with Demonstration of Preparations from the Blood.—The diagnosis of malaria, though actually present, is difficult in the case of children on account of irregularity of the temperature curve (the intermissions not being complete) and the indefiniteness of the cold and sweating stages. Usually all that one can determine is disturbance of the general health, with exhaustion, fever, restlessness, &c. The examination of the blood had been found by Hr. Hochsinger to give the only sure ground of diagnosis. In the meeting of the Wiener Medizinisches Doktoren-Kollegium, on 20th April, he described the colouring method he employs.—(Deut. Med. Zeitung, 7th May, 1891.)

MATERIA MEDICA AND THERAPEUTICS.

By C. O. HAWTHORNE, M.B., C.M.

Arsenic as a Drug.—In a lecture delivered as part of the London Post-graduate Course, Mr. Jonathan Hutchinson discusses very fully the therapeutic value and mode of action of arsenic when taken internally. He considers that it has almost specific value in cases of pemphigus and allied skin diseases, and in dermatitis herpetiformis. The eruption of psoriasis will, he believes, in the majority of cases disappear if arsenic is well pushed, but a complete cure is seldom or never effected unless efficient local measures are also adopted. In the eczematous type of skin affections Mr. Hutchinson doubts the value of arsenic, and is convinced that in anything like full doses it makes such eruptions worse. With regard to herpes, he quotes the recently
published statistics of Dr. l. Neilson of Copenhagen—showing that amongst 520 cases of psoriasis treated with arsenic shingles occurred in 10, whilst of 220, in which iodide of potassium was administered, not one patient developed shingles—in confirmation of the statement he made in 1864, that arsenic may cause herpes zoster, such a result usually developing after the drug has been used some time. "It appears probable that the use of arsenic may be resumed after a time without material risk of reproducing the herpess." For those cases in which herpes recurs again and again in the same situation—e.g., on the genitals, the lips, and inside the mouth, Mr. Hutchinson is convinced that in arsenic we have a certain remedy, and that, as a rule, no return of the eruption is to be apprehended provided the drug has been continued for a considerable time. Lichen planus he finds sometimes improved under, sometimes made worse by arsenic; in the latter cases tartar emetic acts satisfactorily.

He repeats his previously published views, questioning the popular conclusion that arsenic has a tendency to improve the nutrition of the skin. Nor is he convinced that arsenic has any direct general tonic action. Indeed, under its full influence he finds patients become languid and out of health, and he explains the tonic effect which follows its administration in some cases as due to the removal of some irritating disease—e.g., pemphigus or herpess. Mr. Hutchinson considers that arsenic may undoubtedy cause peripheral neuritis, as is shown by the occasional production of herpes zoster, by the numbness and tingling of the soles of the feet which patients occasionally experience, and by the occurrence of local and unsymmetrical forms of paralysis which, as noted by Christison, sometimes develop in cases of arsenical poisoning. He believes that in small doses arsenic may be safely continued for long periods, but that in anything like large doses its use is not without danger. Alarm is to be taken if the patient experiences numbness and tingling in the palms and soles, numbness in any part of the skin, decided loss of flesh, liability to diarrhoea, and in a certain number of cases extreme irritability of the bladder. Some of these effects he more frequently observes than the usually recognised irritation of the conjunctiva. Speaking generally, Mr. Hutchinson has an unfavourable opinion as to the influence of arsenic upon elderly persons, and especially if any symptoms of nerve degeneration are present. He concludes by saying that whilst we may freely avail ourselves of its services, we must, "perhaps, rather more than has heretofore been felt necessary, watch its effects, and be prepared, if need be, to forbid its use."—(Brit. Med. Journal, 6th June, 1891.)

Neuritis due to Poisoning by Arsenic.—Dr. E. G. Cutler, in the Boston Medical and Surgical Journal, reports a case of neuritis due to poisoning by arsenic. The patient was in the habit of placing in his mouth a number of green paper labels—which were proved by analysis to contain arsenic—in connection with his employment. The earliest symptoms were numbness and prickling of the fingers, with weakness of the right hand. The weakness in a few days extended to the other limbs, and was accompanied by general soreness and cramps in the calf muscles. The grasp was feeble and the gait shuffling; knee-jerks absent, superficial reflexes weakened; no dyspepsia or urinary trouble; bowels rather constipated; no headache or disturbance of vision. The patient recovered under the administration of iodide of potassium, sponging with salt water, and subsequent daily rubbing with ice.—(Practitioner, May, 1891.)

The Treatment of Enteric Fever.—Professor Dujardin-Beaumetz, lecturing upon this subject in the Cochin Hospital, Paris, advocates the systematic employment of salol as an intestinal disinfectant. He recommends it in doses varying from 1 to 2 dr. in 24 hours, suspended in any appropriate vehicle, and combined, if desired, with salicylate of bismuth. He opposes the employment of the numerous active antipyretic agents recently introduced, believing that, whilst by their use the temperature may be kept at or near the normal, the gravity of the disease is not in any sense diminished. Further, he contends
that most of these drugs diminish the urinary excretion, and so oppose the elimination of the toxins which are produced so abundantly in the febrile state. Without admitting quinine to have any specific action in enteric fever, he allows that in a great number of typhoid cases this medicine is extremely useful, and he strongly urges the importance of the promotion of free diuresis by giving the patient abundance of fluid to drink. With respect to cold baths, he firmly opposes their systematic employment, as he finds that he gets equally satisfactory effects by the use of lotions, wet packs, and especially of tepid baths, without the disadvantages which attach themselves to the cold bath. His usual practice is to employ sponging and lotions; should the temperature rise above 40°C., he places the patient in a bath of from 30°C. to 32°C. for twenty or thirty minutes, giving him stimulants if he is very feeble. He finds that in this way the temperature is controlled, the nervous system is soothed, and a state of freshness of the skin and general comfort produced which enables the patient to sleep. The bath may be used once or twice in twenty-four hours; when there is intense prostration he employs the wet sheet, keeping it applied for not longer than thirty seconds.—(Therapeutic Gazette, 13th January, 1891.)

Dr. W. C. Cahall also finds salol of great service in enteric fever. He gives at least three grains every two hours day and night, and states that after its administration there was no further rise in temperature; the pulse did not become more rapid, but remained full, and after the first week steadily diminished in frequency. Diarrhoea and tympanites, however severe, soon disappeared.—(Practitioner, January, 1891.)

The Absorption of Drugs in the form of Ointments.—In the Répertoire de Pharmacie Dr. Luff has published some experiments which, he contends, prove that lanolin is the best ointment basis when a local action only is required, as this substance prevents absorption; whilst vaseline favours absorption, and so should be employed when it is desired to obtain the general action of a drug applied in the form of an ointment to the skin. The experiments were made with iodide of potassium, carbolic acid, and resorcin mixed with vaseline, lard, and lanolin. In each case the mixture was placed in a sheep’s bladder, which was suspended in water maintained at an equable temperature, and the water tested at short intervals. The drugs mixed with vaseline in each case were detected earliest, with lard exosmosis was in all more slow, whilst with lanolin no exosmosis occurred within a period of twenty-four hours.—(Medical Press and Circular.)

Lactic Acid in Diarrhoea.—At a recent meeting of the Société Médicale des Hopitaux, Professor Hayem communicated a note on the above subject. Among adults he has had no failures. He prescribes as follows:—Lactic acid, from 10 to 15 grammes; syrup of mulberry, 200 grammes; water, 500 grammes. Half a glass to be taken at a time between meals. Professor Hayem would recommend the same recipe as a prophylactic, and as a curative agent in epidemic cholera.—(Merck’s Bulletin, March, 1891.)

Memoranda.—A case of atropine poisoning is reported in The American Drugist, 15th April, 1891, resulting from the free application of a mixture of subnitrate of bismuth and atropine to an extensive eczematous surface, which had been recently denuded by violent scratching. The patient became delirious, and was partially paralysed. A dose of 50 drops of laudanum and 4 gr. of morphia were required to overcome the physiological action of the atropine.

—The use of creolin in follicular tonsillitis is recommended by Dr. Itzig. He uses a 1 per cent solution, mixed with an equal volume of warm water, as a gargle several times daily, the mouth being subsequently washed with warm water to remove any burning sensation from the throat.—Patents have been recently taken out in Germany for a “single delivery pill box,” and for an “anti-snoring bandage.”
**Abstracts from Current Medical Literature.**

**GYNAECOLOGY AND OBSTETRICS.**

By E. H. Lawrence Oliphant, M.D.

**Massage as applied to the Treatment of Incontinence of Urine in Females.**—At the February meeting of the Royal Academy of Medicine in Ireland (Dublin Jour. Med. Science, April, 1891) Dr. Bagot read a paper on this subject. He gave a full account of the treatment of this affection by the Brandt system, by Sänger's method, which consisted in dilatation of the vesical sphincter, and also by massage, by distension of the bladder with warm water, as practised by Nissen and Marion Sims, junior. He had cured three cases by the use of Brandt's system, omitting some of the steps which he considered useless. The most essential part of this method of treatment was the direct treatment of the neck of the bladder by the finger in the rectum or vagina. In children one used the finger in the rectum. The first case was that of a woman aged 30, married eight and a half years, who had borne five children. She had suffered from incontinence more or less since her last confinement eighteen months previously, and had become worse during the last nine months, her water passing from her whenever she walked about, or on making any sudden effort, such as coughing. She frequently passed her water under her when asleep. Examination showed perineal laceration of the first degree, a rather patulous urethra, slight prolapse of the anterior vaginal wall, and vagina and perineum abnormally distensible; uterus and appendages normal; no abnormal tenderness or irritability of the bladder could be detected on passing a sound; the urine was normal. She was at first treated every day for four days by Brandt's system, omitting "the lifting" of the bladder. She was told to wear woollen drawers, and to try to control her sphincter whenever she felt the water passing from her. After this she was treated every second or third day for twenty-nine days. At the end of this time a permanent cure was effected.

The second case, an unmarried woman of 24 years of age, had suffered from childhood from enuresis. Two years previously she had been treated every second day for six weeks by electricity without benefit. Examination revealed nothing abnormal but a slight cervical catarrh, cured by the application of pyroligneous acid. She was treated by Brandt's system—omitting the "exercises for the adductors of the thighs" and "the bladder lifting"—every second day for five weeks, at the end of which time she was discharged quite well.

The third case was similar to the first. Incontinence on excretion had lasted three years. Treatment was carried on for four weeks; during the first week daily, only the "lifting" being omitted. Afterwards the treatment was performed every second or third day, and the tapotement of the lumbar and sacral regions, as well as the exercises for the adductors of the thighs, were also omitted.

Dr. Bagot discarded the bladder lifting, because it would be impossible to elevate and seize that organ by the manoeuvre described by Brandt when it was empty; and, were the bladder full, the procedure could not be carried out on account of the sensitiveness of the organ. He failed to see how tapotement of the lumbar and sacral regions could be of any use in this affection, or in uterine displacement, and he had discarded it. The exercises for the adductors might be of use when the pelvic floor was greatly relaxed. The chief part of this method was the direct treatment of the neck of the bladder.

Dr. Bagot had treated two patients by the method of Sänger, who believed the basis of the affection to be paresis of the vesical sphincter with, perhaps, a certain tenuity of the muscular bundles. This method was not indicated when there was any very great dilatation of the bladder neck and whole urethra. In these cases, artificial narrowing of the urethra, by some such method as Schultz's or Pawlik's, was more likely to succeed. When the dilatation was not so great, Sänger advised that his method should be tried. Massage by distension of the bladder with warm water was of use in cases of
contraction of the bladder following long continued incontinence of urine from any cause, such as fistula, or where patients had formerly suffered from cystitis of long standing. Dr. Bagot urged the necessity of a careful diagnosis in all cases, paying special attention to the urine and to the other pelvic organs. He found Dr. Nitze's cystoscope to work efficiently, and he employed this method of examination in all cases of bladder trouble. In reply to some objections by Dr. More Madden, Dr. Bagot said that, in applying massage where stroking movements were used, they were performed by the external hand through the abdominal wall, the fingers in the vagina being held quite still, and being used simply to raise and support the parts while being massaged. The internal hand did not move more than during an ordinary bimanual examination. He explained that he had not said he massaged the bladder, but its neck. This he considered the essential part of the Brandt treatment, and it could be applied per vaginum or per rectum, no matter how empty the bladder might be.

Tachycardia at the Menopause.—The New York Medical Journal for 18th April, 1891, devotes a leading article to this subject, and remarks on the small amount of attention hitherto paid to it in the literature of palpitation. It proceeds to quote from Kisch of Marienbad, who has an article in a recent number of the Prager Med. Woch. Dr. Kisch considers this tachycardia to be a purely nervous affection, making itself evident in a decided increase of frequency of the heart's contractions. He states that although the various morbid phenomena attendant on the change of life have received ample attention, this functional affection of the heart has gone almost unnoticed. Stokes, however, in his work on Discourses of the Heart, mentions a form of palpitation at the menopause attended at times with attacks of great rapidity of the pulse. Kisch's clinical picture is as follows:—At the time of the menopause, occasionally after the cessation of the menses, but most frequently between the ages of 40 and 50 years, when the menstrual flow is beginning to show signs of change, paroxysmal attacks of palpitation may occur in women whose heart's action has previously been quite normal. These attacks come on quite suddenly, sometimes without any provocation, and at other times by slight causes, such as would have no effect in a normal state of health. The attacks may come on while the patient is in any posture—walking, sitting, or lying down, and even during sleep. The subjective symptoms accompanying the attacks are a feeling of oppression and of anxiety, throbbing in the carotids and in the abdominal aorta, severe headache and fugitive sensations of heat, and a rush of blood to the head. Occasionally there are noises in the ears, flashes of light before the eyes and dizziness, and, in rare cases, syncope may occur. Objectively the pulse is found to number 120 to 130 or even 200. In most cases it is full, powerful, and regular. The sphygmographic tracings show a high pulse wave, a rapid and abrupt rise of the ascending line, and an equally rapid and abrupt fall of the descending line. Redness of the face and neck is sometimes seen. This may appear in patches, disappears in a few minutes, and is associated with a burning sensation. Free perspiration on the head and back sometimes occurs. The attacks may last a few minutes to a quarter of an hour. Associated with these phenomena are often uneasiness of mind and body, disability for work, and restless sleep disturbed by dreams. In Kisch's cases there was a tendency to plethora, and the patients were apprehensive of apoplexy. The affection may last a few weeks or a couple of years. The author thinks the etiological factor is hyperplasia of the ovarian stroma, acting reflexly on the sympathetic (accelerator) nerve of the heart. He supports his argument by showing that this condition of tachycardia is frequently seen after the operation for removal of the ovaries, which is followed by a shrinking process of the internal genital organs. For treatment the author advises active exercise and wet applications to the lower part of the abdomen, and, as might be expected, he recommends a stay at Marienbad as likely to be beneficial. He finds that small doses of the bromide generally afford relief from the unpleasant sensations attending the attacks.
DISEASES OF THE EYE.

BY FREELAND FERGUS, M.B.

Treatment of Sympathetic Ophthalmia.—Dr. Story of Dublin has recently made a contribution in which he discusses the possibility of operating on eyes that have been blinded by sympathetic ophthalmia. His conclusions are as follows:

1. That no operation should be performed on an eye till all signs of sympathetic inflammation have disappeared, unless the intra-ocular tension be acutely glaucomatous.

2. If an operation have to be performed, it should be a corneal or scleral incision, and no iridectomy should be attempted.

3. When all inflammation has disappeared, the best method of operating is that of Mr. Critchett—i.e., needling. By this method the iris is not wounded, hemorrhage is reduced to a minimum, and the least possible chance is given to inflammatory reaction.

Lastly, no large opening is made in the globe through which a fluid vitreous may escape, as it does occasionally after an iridectomy, in quantities sufficient to produce collapse of the ball.

Dr. Story's paper, which appeared in the Ophthalmic Review, certainly is a remarkable one, and holds out hope to a class of patients who have hitherto been regarded as beyond cure or improvement.

The Decentering of Lenses and the use of Prisms in Ophthalmology.—A great deal has recently been written on these subjects. Readers of even the most elementary ophthalmic literature must be aware that, when a prism has to be combined with a plus or minus spherical glass, it often suffices to decenter the spherical lens without adding the prism. Many oculists have been in the habit of thus using sphericals, not merely to correct errors of refraction, but also errors of convergence. Recently the study of this subject in Britain received an impetus by the publication of Mr. Maddox's admirable little book on prisms, which we noticed in the pages of this journal. Our American confreres are not behindhand either, and numerous and important papers have recently appeared. We would call special attention to Holden's. Many systems of numbering prisms have been devised—e.g., Swann Burnett proposes to number prisms, starting with a prism which will deviate an object one metre distant, one centimetre. Dennett proposed to adopt as his unit the centradian—i.e., a prism which would deviate through an angle equal to the hundredth part of a radian, a radian being 57'. Dr. Jackson proposed numbering prisms according to their angle of minimum deviation. When it is necessary to combine the lens with the prism, any of these units will be found useful; probably the best from the practical point of view is Swann Burnett's.

Holden's paper deals with substituting decenteration of the spherical for the prism. He starts with the simple formula \( \tan \theta = \frac{d}{f} \), where \( x \) = deviation required, \( d \) = decenteration, and \( f \) = focal length of the glass. Thus, if we start with a powerful spherical lens, say one inch focal length, we wish to know what decenteration is required to give deviation equal to one degree. On applying the formula we get \( \tan 1° \times 25 \text{ mm.} = \text{decenteration in millimetres.} \n\) In a precisely similar way we can get readings for 2°, 3°, 4°, etc. Multiply these readings by the expression of the focal length in inches of the glass you wish to decenter, and you get in fractions of an inch the amount of decenteration necessary to produce the deviation corresponding to the degree for which you have taken the original reading. In practice it may be reduced to this simple rule, which he lays down—"For the effect of any prism, multiply 0.22 mm. by the number of the prism, and for any lens multiply this product by the focal distance of the lens." Thus, suppose we wish to get the effect of
a prism of 2° with a glass whose focal length is \( 1/2 \), we have \( 22 \times 2 \times 15 \) —
i.e., 66 millimetres of decentration.

If, instead of working with inches, we take dioptres, the following rule is
available: — "For the effect of any prism multiply 8.7 mm. by the number
of that prism, and for any lens divide this product by the number of the
dioptres of the lens."

Retro-bulbar Neuritis.—Knapp has recently given us his views on
this affection. The following are the symptoms of the acute form of the
disease:—Headache, ocular pain which increases on pressure; impairment of
sight in all degrees; central scotoma for colour and form (the periphery of
the field remaining normal); general diminution of colour perception; moderate
retinal congestion and serous effusion, followed generally by ischaemia.

Ophthalmoscopically, the fundus may appear normal, or there may be
atrophy of the outer half of the optic nerve, or the whole nerve may be
atrophied.

From an etiological point of view, he divides cases of this nature into the
following five groups:—(1) Cases caused by exposure and overwork of the
eyes; (2) those due to acute and infectious diseases—e.g., measles, diphtheria,
rheumatism, &c.; (3) in a certain number alcohol, nicotine, opium, and lead
poisoning; (4) some he attributes to suppression of the menses; (5) there
remains a residue with no assignable cause.

Prognosis is always doubtful; the disease may end in complete or partial
permanent recovery of sight. On the other hand, there may be permanent
blindness. Sometimes there are only islets of vision left.

The symptoms of chronic retro-bulbar neuritis are:—(1) Diminution of
sight; (2) day blindness, the patients seeing everything as through a fog; (3)
diminished colour perception; (4) central scotoma, at first for colour, then for
form; (5) diminished range of accommodation; (6) normal boundary of visual
fields.

The ophthalmoscopic appearances are the same as for the acute variety.
Knapp says that sometimes there is atrophy of the optic nerve at its lower
and outer part. The disease occurs almost exclusively amongst males, and
may be due to one or more of the following causes—viz., abuse of alcohol or
tobacco; opium, stramonium, lead or carbon bisulphide poisoning; malaria,
syphilis, rheumatism, and gout are also mentioned as causes.

The disease rarely ends in complete blindness, and the prognosis is good so
long as there is no atrophy of the optic disc. The peculiar white section of
the disc is only found in one other condition, and that is in coloboma of the
macula lutea.

Central Scotoma.—Jensen has grouped all the various cases of this
affection which he has seen at Grut's clinic. His classification is as follows:—
(1) Amblyopia centralis; (2) stationary scotomatous optic nerve atrophy; (3)
progressive scotomatous optic nerve atrophy; (4) bilateral scotoma, with
optic neuritis; (5) unilateral ambylopia, neuritis or atrophy with central
scotoma; (6) glaucoma.


Plain Talks on Electricity and Batteries, by Horatio R. Bigelow, M.D. London: H. K. Lewis. 1891.


Illustrations of the Inductive Method in Medicine, by Wm. Murray, M.D. London: H. K. Lewis. 1891.


Exophthalmic Goitre,

Dr. A. M. Ramsay.
THE

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ORIGINAL ARTICLES.

EXOPHTHALMIC GOITRE: A CLINICAL STUDY.

By A. MAITLAND RAMSAY, M.B., C.M.;
Being his Thesis for the Degree of M.D. in the University of Glasgow.

(With a Lithographic Plate.)

NOMENCLATURE.

[The small figures in the text refer to the Bibliography at the end.]

To a group of symptoms, the chief of which are protrusion of the eyeballs, enlargement of the thyroid gland, palpitation of the heart, and accelerated pulse-rate, different names have been given by different writers. In this country and in France the usual designation is "Graves' disease"¹ (Trouseau's Maladie de Graves),² while the Germans, in honour of their own countryman, write of "Die Basedowsche Krankheit;"³ and Basedow himself, in order to emphasise the protrusion of the eyeballs, proposed the name of "Glotzaugen-cachexie."³ The term used by Mackenzie is "Exophthalmus Anaemicus;"⁴ by Laycock, "Exophthalmic Bronchocele;"⁵ by Féral, "Ataxie Cardiovasculaire;"⁶ by Gros, "Dyscrasie Exophthalmique;"⁷ by Hirsch, "Cardiogmus Strumosus;"⁸ by Lebert, "Tachycardia Strumosa Exophthalmica,"⁹ &c., &c. In the following pages the name Exophthalmic Goitre, which calls up in the mind a picture of the disease in its most typical form, and which at the same time implies no theory as to its causation, will be almost exclusively employed.
HISTORICAL.

As far back as the year 1722 Saint-Yves referred to cases of exophthalmos, which were probably of the same nature as those to be considered in this paper; and two years later similar reference was made by Louis. In 1791 Gilibert treated briefly of this matter; but, so far as is yet known, Flajani was the first to notice the coincidence of goitre with lasting palpitation of the heart. He quotes three cases,* all occurring in males, but in none of them does he make any reference to the condition of the eyes. The disease was undoubtedly recognised by Parry, a physician who practised in Bath at the end of the last century. After his death a collection of his unpublished medical writings was made, and in these at least eight cases are described under the designation of "enlargement of the thyroid gland in connection with enlargement or palpitation of the heart." It is only in the first of these cases, however, that he makes any reference to prominence of the eyeballs; and, as this case, therefore, possesses an historical interest, it may be briefly summarised. The patient was a married woman aged 37, who had been attacked by rheumatic fever after her confinement. This was followed by violent palpitation of the heart, with symptoms resembling cardiac asthma. She also suffered from hæmoptysis, with severe pains over the lower portion of the sternum. When Parry first saw her the pulse was 156, irregular and intermittent, and the palpitation was so violent that the whole chest was shaken with each beat of the heart. "About three months after her lying-in," says Dr. Parry, "while she was suckling her child, a lump about the size of a walnut was perceived about the right side of the neck. This continued to enlarge until the period of my attendance, when it occupied both sides of her neck, so as to have reached an enormous size, projecting forwards before the margin of the lower jaw. The part swelled was the thyroid gland. The carotid arteries on each side were greatly distended, the eyes were protruded from their sockets, and the countenance exhibited an appearance of agitation and distress which I have rarely seen equalled."

Demours seems to have known this disease, as in his Traité des Maladies des Yeux he describes the case of a girl aged 11 years, who suffered from prominence of the left eye-ball, with enlargement of the thyroid gland. Her mother had also suffered from goitre since her first confinement. No

* Dr. Beigell does not believe that the cases of Flajani were true examples of exophthalmic goitre (see Reynold's Medicine, vol. v).
mention is made of any heart affection. Although several other writers, amongst whom may be mentioned Wardrop, Wenzel and Ware, Middlemore, &c., refer to cases of goitre with palpitation, or of exophthalmos with palpitation, the first account of the disease in which its three characteristic symptoms are clearly mentioned was given by Graves in 1835. It is true that seven years previously Adelmann had carefully recorded the clinical history, as well as the post-mortem appearances, in two cases in which considerable goitre appeared along with enlargement of the heart, and in which during life there had existed continued violent palpitation, great dyspnœa, and abdominal pain. In one of the cases it is specially mentioned that, in addition to these symptoms, "the staring look of the large eyes caused a very remarkable aspect." Still it was not until Graves published an account of his cases that the three symptoms—exophthalmos, enlargement of the thyroid, and palpitation of the heart—became properly associated, and their co-existence recognised as a specific disease. It is of some interest to note that Graves speaks only incidentally of the prominence of the eyeballs, and draws attention more particularly to goitre with palpitation. Alluding to this subject in his clinical lectures, he says:—"I have lately seen three cases of violent and long-continued palpitation in females, in each of which the same peculiarity presented itself—viz., enlargement of the thyroid gland. The size of this gland, at all times considerably greater than natural, was subject to remarkable variations in every one of these patients." Only in connection with one of these cases, however, does Graves make any mention of exophthalmos, and this was one which was communicated to him by Stokes after hearing his clinical lecture on the combination of palpitation of the heart, with enlargement of the thyroid gland." In that communication Stokes thus refers to the eyes:—"The eyeballs were now observed to enlarge gradually, until at length their condition imparted to the countenance an unearthly expression. The tumefaction continued to increase until the globes of the eyes appeared to protrude from the orbits, looking downwards and forwards, and exhibiting a zone of the white sclerotic round the entire circumference of the cornea of at least two lines in breadth. The lids could only be half closed; and the appearance of this lady during sleep, with these great brilliant eyes yet open, can never be effaced from my memory. It was remarkable that the conjunctiva was never vascular, nor were any symptoms of ophthalmia developed, such as we see occurring in the open
eye which attends in the facial paralysis described by Sir Charles Bell. Notwithstanding the unnatural enlargement of the organs, there was no alteration in the power of vision." To Stokes, therefore, must be given the credit of being the first of the Dublin physicians to draw attention to exophthalmos in connection with goitre and palpitation, and as has been already said, he communicated his observation to Graves, who published it in his clinical lectures.

By this time the disease had attracted considerable attention, and in Germany Basedow, who was practising in the little town of Mersebourg, published in detail an accurate clinical description of several cases. But if Graves in his lectures laid special stress upon the condition of the heart and the enlargement of the thyroid, and only referred to the eye symptoms in an incidental way, Basedow certainly gave an undue prominence to the last, and failed to emphasise the importance of the associated palpitation and the enlargement of the thyroid. Hirsch and others have claimed for Basedow a priority of observation, and looking upon him as the true founder of our knowledge of exophthalmic goitre, have identified his name with the disease; but as Wickham Legg 21 points out, "Basedow never seems to have grasped the threefold character of the symptoms; he dwells on the exophthalmos to the exclusion of the other two." The Dublin physicians, on the contrary, while recognising the exophthalmos, did not forget the other two, and to the names of Graves and Stokes, already mentioned, must be added that of Sir Henry Marsh, 22 who, in an address before the Pathological Society of Dublin in 1841, said that "it would be perhaps in the recollection of many of the members that he had last year [i.e., 1840] described a singular variety of disease," characterised by "rapid, violent, and irregular action of the heart, co-existing with enlargement and swelling of the thyroid gland. He had mentioned, also, that in the majority of these cases there was a remarkable prominence and protrusion of the eyeballs, so as to give to the group of symptoms by which this disease was characterised a very striking feature." These observers, then, ought at least to share with Basedow the honour of having laid the foundation of our knowledge of this subject. In Scotland, Begbie 23 was the first to recognise the intimate association of the three symptoms—his observations having been made as early as the year 1839—and, in a memoir presented to the Medico-Chirurgical Society of Edinburgh, he asserted the entity of the disease, and advanced a theory of its causation—namely, its dependence on anaemia. Since then
writers of all countries have recorded their observations of cases, and have added much to our knowledge of this peculiar affection; and, in reviewing the recent literature connected with the subject, it is interesting to note how symptoms at first looked upon as rare and abnormal have come to be regarded as constant features in the clinical picture of the disease as we know it at the present day.

ETIOLOGY.

Sex.—While all writers are agreed that exophthalmic goitre is more frequent among females than it is among males, they differ very much regarding the relative proportion of cases in the two sexes. Thus, while Charcot\textsuperscript{24} states that in his experience the disease is nearly as frequent in men as it is in women, Hardy\textsuperscript{25} says that it attacks women almost exclusively. Gowers\textsuperscript{28} gives the ratio as about five to one; Eulenburg\textsuperscript{27} as two to one; while Trousseau’s cases give it as fifty to eight; and out of fifty-one cases collected by West\textsuperscript{29} only three were males. It is usually stated that in males the cases are frequently “incomplete,” and in the only case of exophthalmic goitre which I have seen in a male there was no enlargement of the thyroid gland.

Age.—The disease may occur at almost any age, but is most frequently met with during early adult life—in women between the ages of 15 and 30, and in men between the ages of 30 and 45. Exceptional cases have been recorded occurring in children; thus “Devol observed it in a girl of 2\frac{1}{2} years, Rosenberg in one of 7 years, Solbrig in one of 8, and Trousseau in one of 14.” Hilton Fagge\textsuperscript{29} mentions a case in a woman 58 years old, and Stokes gives an instance of it as occurring in a lady of 60, while Charcot, in his Leçons du Mardi, relates a case in a man of 68 years.

Hereditity.—It is very rare to find that a near relative of the patient has also suffered from this disease, but cases have been recorded in which a very marked family tendency was observed. Oesterreicher\textsuperscript{30} relates a remarkable case of a woman who had ten children, eight of whom suffered from exophthalmic goitre; and of those eight, one had four grand-daughters affected by it; of the two who escaped this disease one is described as hysterical and the other as epileptic. Cheadle\textsuperscript{31} instances in a similar way the case of an aunt and three nieces, Wild\textsuperscript{32} of a mother and three sisters, and Hale White\textsuperscript{33} of three sisters. But if direct inheritance is rare, a family predisposition towards nervous diseases is by no means
unfrequent. Gowers had at one time under his care "two sisters, one for epilepsy, the other for severe exophthalmic goitre," and the association of the disease with "epilepsy, hysteria, chorea, diabetes, and insanity, whether in the patient or in other members of the same family, has often been noticed." Among my own cases is a patient whose mother, a sister, and an aunt were all insane and inmates of a lunatic asylum.

West has called attention to the close association of exophthalmic goitre with rheumatism, and in the case which has formed the basis for this thesis the patient herself dated the first appearance of her symptoms to a severe attack of rheumatic fever. In the British Medical Journal of 30th May, 1891, Dr. Spender of Bath drew attention to the close affinity between rheumatoid arthritis and exophthalmic goitre. Although persons in apparently good health may be attacked, a neurotic predisposition certainly favours the occurrence of this disease, and especially is this so when the patient is anaemic or chlorotic, or exhausted from acute illness.

In a few cases, as in one mentioned by Begbie, an injury to the head seems to have been the starting point of the disease, and in one of the cases recorded by Bristowe exposure to cold seemed to determine the onset of the symptoms. But whatever may have been the predisposing cause, it is certain that the most frequent exciting cause is either some depressing emotion, prolonged mental anxiety, or sudden fright.

With reference to this last—namely, sudden fright—Mackenzie has drawn attention to the close resemblance presented by a well marked case of exophthalmic goitre to the appearances described by Darwin, as characteristic of man in intense fear. He says, "we have only to imagine the condition to become prolonged by a failure of the nervous system to recover its balance and to right itself, and we have a more or less complete clinical picture of Graves' disease," and again, "the existence of a certain abnormal condition of the nervous system having been once established, we know how in time it becomes dissociated from its exciting cause, rises to independence as a disease in its own right, and may require only a minimal excitement to set it off. In many cases the disease is started anew by severe mental shock; probably in a good many more it is the expression of the unconscious memory of the individual of some such shock in an ancestor."

In most cases the onset of the disease is gradual, but it has been known to follow on some profound emotional disturbance with great rapidity. Thus, Trousseau relates the case of a
woman who, after a night of weeping on account of the death of her father, "whom she had attended at the cost of great fatigue, suddenly felt her eyes swell and lift up her eyelids." At the same time she suffered from bleeding from the nose, the thyroid gland throbbed in an unusual manner, and increased notably in size. Violent palpitation of the heart came on simultaneously with the other symptoms, and four days later Desmarres recognised the true nature of the disease.

In the Dublin Journal of the Medical Sciences Moore has recorded the case of a girl who developed palpitation (pulse 140), exophthalmos, and enlargement of thyroid immediately after hearing of the death of her brother. The symptoms all disappeared within forty-eight hours.

During pregnancy exophthalmic goitre is very rarely developed,* and it is interesting to note that in cases where the symptoms were all well marked, marriage, pregnancy, and the other duties incident to the maternal state have caused them to disappear completely. From the beneficial influence of marriage and the fact that a very large number of cases occur in girls about the time of puberty, authors, as a rule, have associated exophthalmic goitre with some derangement of the sexual functions.

Trousseau writes that "most of the women who have Graves' disease suffer from amenorrhœa also. In the beginning menstruation is only disturbed, but it is after a time completely suppressed, and hopes of a favourable issue are not to be entertained until this function is perfectly re-established. This is an important prognostic sign." We cannot, however, establish any constant relation between exophthalmic goitre and the catamenia, because all the patients suffer also from anæmia, and the condition of blood-poverty is a sufficient explanation for the occurrence of menstrual irregularities. Moreover, it has already been stated that the disease may occur in young children before the age of puberty, and in women after the climacteric period; and the very fact that it also occurs in men ought to prevent us from associating as cause and effect conditions which are merely coincident. (See case of L. Mc'M., page 89.)

**Symptomatology.**

Stokes writes:—"The point of departure of the disease is the heart, the action of which becomes rapid and occasion-

* Hulke mentions a case when, "contrary to the recorded experience of all authors, the symptoms had actually commenced during pregnancy."
ally tumultuous; and subsequently, after a period of time varying in different cases, we observe the enlargement of the thyroid gland and also of the eyeballs, attended by a pulsation of the whole neck, especially in its lateral portions, and in the seat of the thyroid gland itself." These, in their usual order of development, are the cardinal symptoms of exophthalmic goitre, and in a typical case they are all present in a greater or less degree; but many examples of the disease are known where one or other of the cardinal symptoms is absent. Such cases are usually described as "incomplete," but while not exhibiting all the great characteristic symptoms, they may include others which are not always present even in well marked cases. These other symptoms are very various and widespread, and in contrast to the primary or cardinal symptoms they may be described as secondary. The following table after Charcot exhibits in classified form the many different symptoms which may be present:

"**Table showing the Series of Symptoms which may be present in Cases of Exophthalmic Goitre or Graves' Disease—(after Charcot).**"  

| PRIMARY OR CARDINAL | Increased frequency of heart's action (asystole).  
|--------------------| Goitre.  
| Digestive Organs.  | Exophthalmos.  
| Rhythmical vibratory tremor.  
| Vomiting.  
| Bulimia, sudden fits of hunger.  
| Jaundice.  
| Cough.  
| Increased frequency of respiration.  
| Angina pectoris, neuralgia.  
| Paralysis, Von Graefe's symptom, peculiar form of paraplegia.  
| Difficulty of Convergence (Mobius).  
| Convulsions, epileptiform crises.  
| Psychical modifications (emotional, &c.).  
| Vitiligo, urticaria, pigmented patches.  
| Sweating, sensations of heat.  
| Diminished electrical resistance.  
| Polyuria, albuminuria.  
| Glycosuria.  
| Menstrual derangements.  
| Impotence.  
| Anemia, more or less profound.  
| Cachexia, oedema of the lower extremities due to asystole."
The more important of these symptoms will be discussed in detail later on. The following case, which I reported when a clinical clerk in Professor Gairdner's wards during the winter of 1881, and which, through his kindness, I was permitted to watch during the various subsequent residences of the patient in the hospital, gives a good clinical picture of an ordinary case of exophthalmic goitre. The record has been compiled from the Ward Journals. Many of the notes in these were dictated by Dr. Gairdner himself, whose suggestive remarks first awakened my interest in this subject, and to whom I am much indebted for the privilege of completing my original report of the case.

L. M'M., a warehouse girl, 25 years of age, was admitted to the Western Infirmary on 11th November, 1881, in an anemic and much emaciated condition. She complained of protrusion of the eyeballs, swelling in the neck, palpitation of the heart, and general weakness. She had lost her appetite, especially for solid food, was troubled by excessive thirst, and had a tendency to diarrhoea. She was also harassed by a cough, which seriously interfered with her sleep. Her height was 5 feet 4½ inches, and her weight, which in her normal condition had been 9 stones 8½ pounds, was, at the date of her admission, only 6 stones 12 pounds. With reference to hereditary tendencies, it may be here stated that her father died of "asthma" at the age of 54; that the mother was alive and well; that out of a family of nine the eldest three died in childhood, and all the others except the patient were in good health; and that none of her relations had ever had any disease at all resembling that from which the patient suffered. Inquiry into her own previous history elicited that, except for the ordinary troubles of childhood, and an attack of typhus fever from which she made a good recovery, the patient had been, up to 1873, very strong and vigorous, with plenty of colour in her cheeks. It is, however, worth noting that her mammæ had never become developed.

In 1873, within five days after being dismissed from the Fever Hospital as completely recovered from an attack of small-pox, she was seized with rheumatic fever, and was confined to bed for four months, during which period she suffered greatly from severe pain in her head and eyes. To this pain she was inclined to attribute the protrusion of the eyeballs, but at the same time she admitted that owing to home occurrences at the time of her recovery from the rheumatic fever she received a "great fright," and suffered
considerable mental anxiety. At all events, immediately after her recovery she noticed that her eyes were more prominent than they had formerly been, and her friends remarked on the alteration in her appearance arising from her "staring look." She also noticed that the exertion of climbing a stair or any excitement brought on palpitation—not at first causing much discomfort—and she began at the same time to suffer from a feeling of breathlessness, which, however, has never been a very marked feature in her case. The head pain which had been so violent during the rheumatic fever continued, and was at times so severe as to interfere with sleep, and she also gradually lost appetite and became weak and anemic, and several of her molar teeth dropped out, this last occurrence being due, she thought, to the effects of the medicines she took during her illness.

In 1875 her sufferings were greatly relieved by treatment she received at the Western Infirmary Dispensary, where the physician on duty specially directed the attention of the students to the prominence of her eyeballs. Up to this date there had been no abnormal appearances about the neck, but she now noticed, when putting on her collar, a "fullness" in the situation of the thyroid gland, though she was not conscious of any actual swelling until her attention was drawn by one of her companions to the fact that she had a "lump on her throat." This swelling, which she afterwards kept under careful observation, gradually increased in size, but, as it was never painful, she did not think it necessary to consult a doctor about it. Concurrently with this increased size of the swelling, however, the eyes became more prominent, the palpitation, instead of being paroxysmal and brought on by exertion, became more constant, and the general weakness greater; but notwithstanding this she continued regularly at work (though many a day quite unfit for it) until April, 1877, when she was seized with a chest affection—called at the time "congestion of the lungs"—accompanied by pain and cough, which confined her to bed until the end of May. Although she returned to her employment in the beginning of July, she was thereafter off work for days and even weeks at a time—sometimes under medical treatment and sometimes not, and suffering rather from a feeling of general weakness than from any well specialised symptoms. Her eyes, in addition to being more prominent, were now inflamed and painful, and in the end of September, 1881, her throat, which had never previously given her any noticeable trouble, became acutely
inflamed, and so much swollen, that there was great difficulty in swallowing. She was confined to bed for a fortnight, and was thereafter able to resume work for only two weeks when she had again to return to bed, after which, acting on the advice of the doctor who was attending her, she became an in-patient of the Western Infirmary.

Her menstruation, which began when she was 14, was quite regular up to 1877 (the year when she suffered from the chest affection); but thereafter, for three years, there was amenorrhea, accompanied by ulceration of the left leg above the ankle. Under external treatment the ulcer healed, and soon after the menses returned, and continued regular till the time of the inflamed throat (September, 1881), after which there was no menstruation.

A careful examination of the patient after her admission to the hospital showed that she was very easily excited, sheer nervousness making her perspire very readily, and even the exertion of speaking causing her face to flush. The temperature ranged from 98° to 100° F., the respiration varied from 23 to 25 per minute, and a sphygmographic tracing of the pulse showed an internimission after every sixth beat, the pulse rate averaging about 123 in the minute. The eyes, while prominent enough to attract immediate attention, did not project so far as to prevent the eyelids from closing during sleep, and there was a considerable, though variable, amount of conjunctivitis. The swelling of the thyroid was of an elastic consistency, and did not _per se_ occasion much discomfort, yet very slight pressure on it produced a sensation of choking. It extended from below the upper border of the manubrium, along the side of the trachea and larynx to above the middle of the thyroid cartilage, and measured over six inches across at its widest part, and about two and a quarter inches vertically in the middle line. The blood-vessels of the neck could be seen pulsating at its sides, and a thrill of considerable intensity was communicated to the hand on palpation of the tumour. No blowing murmur could be heard over the swelling itself, but a venous hum was detected over the right sterno-clavicular articulation, and inspection of the chest at once revealed undue pulsation over the cardiac area in at least four intercostal spaces—viz., those from two to five inclusive. It was difficult to determine the exact position of the apex beat, but the centre of greatest pulsation seemed to be in the fourth intercostal space, a little to the inside of the vertical line of the nipple. There was no thrill detected over the cardiac area. Percussion revealed that the left margin of
cardiac dulness lay about half an inch or more to the outside of the nipple line, while the right margin was about one and a quarter inch to the right of the middle line, and the upper margin was at the upper border of the third rib. The area of cardiac dulness, which measured fully five and a quarter inches in transverse diameter, was therefore considerably enlarged. Auscultation over the apex area revealed marked reduplication of the second sound, well heard towards the right, but less and less evident towards the left side. A V.S. murmur was distinctly heard at, and confined to, the apex area; while at the base the second sound was again reduplicated, though not so distinctly as at the apex. There was no well defined murmur at the base, nor over the sterno-clavicular articulation; but there was considerable pulsation in the epigastrium, and a V.S. murmur was very easily produced by slight pressure upon the vessels of the neck.

Auscultation of the lungs revealed no striking fact. Though there was slight dulness in the extreme apex of the right side, the respiratory murmur was well heard over all; the vocal resonance and vocal fremitus were equal on both sides, and there were no râles. The expectorated matter consisted of frothy mucus, and was small in quantity. The liver and spleen were normal, and the urine was of amber colour, and contained neither albumen nor sugar.*

The catarrhal ophthalmia was removed in four days by means of a simple lotion; and, between the 19th and 29th November, the general condition of the patient was much improved by the administration of five-minim doses of the tincture of digitalis three times a day. By the 22nd November the action of the heart, though still rapid, had become more regular; and the intermissions in the pulse beat could not be detected by the finger; but auscultation over the cardiac region still revealed intermittent action—now, however, irregular. The reduplication of the second sound was not much, if any, less distinct, and the apex murmur had disappeared, and become replaced by a prolonged and muffled first sound. When the digitalis was stopped the irregularity of the pulse at once returned, so the drug was again prescribed, ten-minim doses to be taken thrice a day; but, as it soon caused gastric symptoms, its use was discontinued, and syrup of the iodide of iron and cod-liver oil substituted with beneficial results.

On the 5th December the patient experienced considerable

* The facts in the physical diagnosis were all confirmed by Dr. Middleton at the time.
suffering from a distressing pain—dull rather than acute, and similar to what might have arisen from excessive weariness—all the way down the left arm, and next day a slight swelling of the hand was evident. Four days afterwards the right hand was similarly affected, but in both the swelling passed off four days after its first inception; and it may here be noted that at no subsequent stage of the case did this symptom (which Professor Gairdner was inclined to attribute to thrombosis) ever recur.

For a few days subsequent to the 13th January, 1882, there was swelling accompanied by pain in the epigastrium, but though such symptoms had previously been followed by the re-establishment of menstruation, in the present instance no such result took place.

From the 18th January onwards the enlargement of the thyroid was treated by the application of an electric current (from a battery of from five to ten Leclanché cells) to the neck in the region of the first sympathetic ganglion. The positive pole was placed over the sixth cervical vertebra, and the negative pole was pressed deeply down into the lateral portion of the sterno-mastoid muscle, so as to be as near the ganglion as possible. The current was allowed to pass for periods of from four to eight minutes, and the sides of the neck were treated alternately. The patient fancied that under this treatment not only did the tumour become rapidly smaller and softer, but also that during the passage of the current her pulse became slower. It was, however, difficult to substantiate these impressions, and doubtful whether the wish might not be father to the thought. As regards the pulse, certainly a fall of four beats in 120 was usually found.

By the end of January the general and special treatment employed had effected a very marked improvement in the condition of the patient. There had been a gain in weight to the extent of 1½ stone, and all symptoms of lung affection had disappeared. The pulse, though quick, was quite regular and strong. Though the eyeballs protruded apparently as much as before, the patient was herself inclined to believe that there had been an appreciable recession, and declared that she felt that she was now able to shut the eyelids more easily; but though this was the case, the eyelids still remained slightly apart during sleep, and there were on several occasions attacks of ophthalmia arising, without doubt, from irritation due to this want of power to close the eyelids completely. The thyroid swelling had certainly been greatly
reduced, the lateral measurement being now only 5½ inches, and the vertical barely 2 inches, as against 6 inches and 2½ inches respectively at the time of admission; or, to give perhaps a still better test, whereas on admission no jugular fossa could be seen, this was now quite distinct, and while formerly no collar could be worn without intense discomfort, a moderately wide turned-up collar could now be kept on with tolerable ease.*

On the 8th of February† the patient left the infirmary and went home, but was readmitted on the 24th of February of the following year. Her condition at the time of this second residence in hospital may best be indicated by a comparison of her condition at that date with the results of the observations made at the time of the first admission. The case was one of typical exophthalmic goitre, with decided dilatation of the heart and a murmur, varying from time to time, but essentially V.S. in rhythm, and most accentuated in the apex regions. The symptoms, dating from the attack of rheumatic fever in 1873, and having a possible actual origin in the fright already noted, seem to have occurred in the following order:—

1. Rather sudden prominence of the eyes.
2. Palpitation, soon after, if not contemporaneous with, the eye symptoms.
3. Thyroid swelling, first noticed two years after the first and second symptoms.
4. Progressive weakness and nervous exhaustion.
5. Congestion of the lungs (first confinement to bed) followed by increasing weakness.

Though this was the probable order of occurrence, Professor Gairdner notes that it could not be assumed as absolutely certain that the palpitation was not contemporaneous with, or perhaps even antecedent to, the prominence of the eyes, inasmuch as the patient could not positively affirm that she had no palpitation during the attack of rheumatic fever, though she was quite sure she had none before that time. On the other hand, the swelling on the neck came a considerable time after the prominence of the eyes, as it was not detected until two years after the latter, and even supposing it to have been present before detection, it must have been very insignificant.

The exophthalmos had remained unchanged, under treatment

* From a note made in the Ward Journal by the late Dr. J. M. Young, at that time Resident Assistant.
† From this point onwards the record of the case has been compiled from notes in the Ward Journal dictated by Dr. Gairdner.
or otherwise, since its first appearance, but the diminution in
the size of the thyroid swelling, which took place, as already
noted, under treatment by galvanism, had remained. The
topmost level of the tumour laterally still, however, corre-
sponded with the thyroid cartilage, and the vertical measure-
ment with the isthmus, which extended from below the cricoid
to about half an inch from the jugular fossa. The enlarged
gland felt to the finger tolerably uniform in consistence and
quite solid, but moderately elastic—somewhat like a very
well-stuffed hair-cushion. Over nearly every part of it, but
especially over the right lobe, an arterial bruit or soufflé could
be heard, and the carotids on both sides conveyed a well
marked murmur, but it was remarked that the lateral thrill
formerly observed could not now be detected.

Though the irregularity of the action of the heart formerly
noted had disappeared, the limit of the area of cardiac dulness
remained practically the same; but the extent of the abnormal
cardiac pulsation seemed less, and there was now a punctuate
apex beat immediately below the fourth rib, and just to the
outside of the vertical line of the nipple. A feeble and more
diffuse impulse existed also in the fifth intercostal space out-
side of the nipple line. A V.S. murmur was still distinctly
present over a considerable portion of the cardiac dull area,
but could not be identified with the point of the apex beat,
being more distinct both to left and to right than it was at
that point, and most distinct of all below the third costal
cartilage, just at the margin of the sternum. There also
the second sound was accentuated with the merest hint
of reduplication, but this had nothing of the distinctness
formerly indicated. The epigastric pulsation previously
noticed was gone.

Auscultation and percussion of the lungs revealed only
normal conditions (the slight dulness of the extreme right
apex having disappeared), and the respiratory murmur was
now remarkably good in both apices. During the whole of
this residence the temperature was normal.

The application of the constant current, and the administra-
tion of tincture of belladonna effected considerable improve-
ment in the patient's condition, but as no further progress
could be observed after the end of April she was discharged
from the Hospital.

She was readmitted on the 24th February, 1888, and on
this occasion, although her general aspect did not differ much
from what it had been in 1883, except that she had lost flesh,
and she herself maintained that she felt better, yet after
examination important changes were detected in her condition as a whole.

Though there was just a possible trace of improvement in the exophthalmos, it was still very manifest, and when she was asked to drop her eyelids as in sleep, a small opening showing the sclerotic, and capable of being closed only by a strong effort, always remained. There had not, however, been recently any of the conjunctival inflammation formerly complained of. Neither Von Graefe's nor Stellwag's symptoms were present, and opthalmoscopic examination revealed no abnormality in the fundus of either eye.

The swelling of the thyroid, though smaller than it was at first, had been again increasing for some two or three months. Pulsation and thrill in the substance of the tumour had certainly diminished, for neither was now very evident; nor was the arterial soufflé general, although over a point of the right lobe Professor Gairdner succeeded in detecting a hum not unlike the placental soufflé, but less in degree than at any previous examination.

There had recently been a good deal of palpitation, but the area of cardiac dulness as mapped out by percussion was similar to that previously noted. Auscultation revealed that while the first sound was in some parts of the cardiac area a little prolonged, and even murmurous, there was nowhere a well marked murmur such as was formerly described. Subsequent examination detected no new feature. Careful inquiry was made as to any recurrence of the pains in the arms felt in 1881, but they had never been again experienced, nor could anything at all resembling angina pectoris be made out as connected with them.

Fever, which during the first and second residences in 1881 and 1883 had been only just indicated, and that merely at times, was now well marked, the temperature at 1st March reaching as high as 103° F., and the only approximately normal record being on the day after admission. The patient did not seem to be aware of any change in this respect, and was thus unable to give any date when it might have begun, but was of opinion that she "had always felt hot about the hands." The pulse, which was still 125 per minute, did not seem to be so much affected by the fever as it would have been in an ordinary case with so high a temperature.

A nasty hacking cough had made its appearance, and the expectorated matter, though purely catarrhal, had a trace of muco-purulency, which was a new feature. Although this was so, the appearance of the patient notwithstanding the
emaciation was not markedly tubercular, and there was no clubbing of the finger-ends.

An examination of the lungs to such an extent as the patient's condition would permit did not reveal any lesion worthy of special notice beyond catarrhal râles, chiefly at the bases, but perhaps a little unduly distributed towards the left apex behind; nor did anything revealed, either by percussion or auscultation, suggest condensation, and more especially acute condensation of any part of either lung. Repeated examinations at last caused some suspicion to fall on the right apex and the left base as having an inferior respiratory murmur; but if this were so, a change afterwards took place, and the respiratory murmur at these parts became rather stronger than at the corresponding parts of the opposite side. A persistent pain, which was first felt on the 14th March, and was associated with friction sound, was relieved by the application of a fly-blister.

At the date of this admission to hospital the urine had a specific gravity of 1022, an amber colour, and an acid reaction. It contained a mucous sediment, abundance of chlorides, and distinct traces of albumen. A week after admission the specific gravity was 1023; the colour deep amber, the reaction acid, and albumen still present, although in small quantity.

From the 21st March onwards the constant current was applied to the neck in the manner formerly described, and, as before, the galvanism seemed to have a beneficial effect. During these applications the eyes and pulse were carefully observed, so that any change might be at once noted. As before, the pulse rate was reduced by about five beats per minute, but no change whatever could be detected in the appearance of the eyes.

By the middle of April the patient felt distinctly better and stronger; and although she still complained of palpitation as much as ever, she thought she could close her eyelids more fully, and experienced less sensation of swelling about the throat. The enlargement of the thyroid remained to all appearance much the same, and over both lobes there could be heard a low, continuous, humming sound, and a distinct, but by no means constant, arterial soufflé. By the 13th April the urine had become normal, and the cough, though still causing considerable annoyance in the morning, was very much easier; and as this improvement was maintained, the patient was discharged about the middle of June in fairly good condition, except that there was slight dulness on percussion over the outer end of the right clavicle, with
an occasional moist râle. The sputa were at times distinctly purulent.

When the patient was again readmitted in the beginning of June, 1889, the lung affection had made rapid progress, and she was in an advanced state of emaciation. Attacks of diarrhoea, which had been an occasional symptom for years, had of late been much more persistent, and sometimes accompanied by griping pains, but, so far as could be ascertained, there were no signs of dysentery. The special phenomena connected with the neck and eyes seemed unchanged. The palpitation was less marked, but the pulse rate (now always over 130) was sometimes as high as 140, and although quite regular, was very thready and small at the wrist. The temperature was not strikingly abnormal, the maximum (just after admission) being 100.2° F., and the mean 99°.

The patient was conscious of heat and occasional sweating, but never of chilliness. The cough was very troublesome, but the sputa were mainly catarrhal, with a good deal of froth, and had neither any definite globular nor nummular appearance, nor any trace of blood. There was some dyspnœa, but this, however, was not so bad as it had been some time before. The anæmia, though considerable, was not out of proportion to the emaciation. The fingers were very much attenuated, but showed no appearance of clubbing. Swelling of the feet, which had been observed during the time she was at home, was not present at the date of readmission. The pain in the arms, previously alluded to as possibly symptomatic of thrombosis, had never returned; and the only discomfort that had been experienced in the chest since her discharge from the Infirmary had been in the region of the upper lobe of the right lung.

Such brief examination of her chest as her condition permitted failed to disclose any very definite cavernous signs. Catarrhal râles were present in various places, particularly in the right mammary and infra-mammary regions, and thence into the lateral region. The respiratory murmur was harsh, and with the expiratory portion everywhere more or less prolonged, but it did not present any special phenomena localised in the apices, where the râles were less abundant than they were lower down. The right base was inferior in percussion to the left, but still by no means absolutely dull. No noticeable difference in percussion could be detected in the apices, neither of which could be said to diverge appreciably from the normal standard.
A week after the patient's admission the diarrhoea still continued to be the prominent symptom of the case; but by the middle of the month it had yielded to treatment, so that the bowels were only moved twice a day, and the stools were pretty well formed. A little later, trouble was experienced from epistaxis, and the sputa became pretty freely tinged with blood. In the end of June typical purpuric spots were observed over both legs.

During the following months the weakness gradually increased, and by the end of September and in the beginning of October there were frequent attacks of sickness and vomiting, not only after meals, but also independently of the ingestion of food. The patient had been fed largely by means of nutrient suppositories, but latterly had been able to consume considerable quantities of milk and beef-jelly. The bowels continued to be moved twice a day, and the motions were loose, but never contained any blood.

At this date the swelling in the neck seemed to be decidedly smaller, and the temperature, which occasionally rose to 101° F., had a tendency to be subnormal. The urine had a specific gravity of 1021, was neutral in reaction, and contained a trace of albumen. There was a brick-red flocculent deposit, consisting of amorphous urates and a few epithelial cells. No tubercular bacilli could be found in the sputa.

By the 7th October the looseness of the bowels and the sickness had been got rid of, and the patient was able to take some semi-solid food; but towards the end of the month the diarrhoea again returned, and, as it could not now be controlled by treatment, death resulted from asthenia on the 27th of the month.

Dr. Coats made a post-mortem examination of the body two days afterwards; and, by his kindness, I am permitted to complete my record of the case by quoting his pathological report.

"External Appearances.—The body is very greatly emaciated. There is considerable prominence of the thyroid, almost confined to the right side.

"Chest.—The pericardium contains three ounces of dark fluid blood. There are blotches of haemorrhage in the visceral pericardium, both in ventricles and auricles, but chiefly in the surface of the right auricle, which is almost covered with an ecchymosis, in some places so thick as to conceal the colour of the muscle. On section, the blood here is seen to be entirely superficial. On opening the heart, a very marked ecchymosis is found in the left ventricle, forming considerable patches, chiefly in the septum and posterior wall. This
hæmorrhage is seen, on section, to be sub-endocardial. There are a few small blotches in the right ventricle, and a very considerable hæmorrhage in the right auricle, where it seems to involve partly the muscular trabeculae. There is slight hæmorrhage in the left auricle, almost confined to the septum. The mitral orifice admits two fingers. The curtains are somewhat thickened, and the tips of the musculi papillaris show fibrous transformation.

"The thyroid gland is seen to be greatly enlarged, especially the right lobe, whose upper extremity reaches the level of the upper border of the thyroid cartilage. There are various cysts visible from the surface; one of considerable size near the upper border. Under the microscope the appearances presented are those of the regular colloid goitre—namely, saccules of the gland more or less distended with colloid matter, and sometimes forming distinct cysts.

"There is also very marked enlargement of the lymphatic glands in each side of the trachea, as well as of those at the root of the lung. The glands are generally pigmented in their central parts, while the peripheral portions have a reddish colour.

"The left lung is non-adherent. It contains minute white tubercles in large numbers, especially in the upper lobe. The right lung is adherent at the base; it also contains tubercles, and in addition the upper lobe is œdematous. There is no appearance of old lesion in either lung.

"Abdomen.—The spleen is considerably enlarged, weighing 13½ oz. It is rather soft.

"The kidneys are somewhat enlarged and soft. They weigh: the left 7¼ oz., and the right 7½ oz.

"The mesentery contains a few old calcareous masses, one of them nearly as large as a hazel-nut and round in shape. In addition there is a localised enlargement of glands in the neighbourhood of the root of the mesentery, and mainly towards the right side, so that this mass lay close to the head of the pancreas. On section, it shows oval glands of grey colour and soft consistency.

"The small intestine shows one small, somewhat pigmented tubercular ulcer at the upper part of the jejunum. It has the overhanging edges, and shows on the serous surface the regular white nodules of the tubercular ulcer. Otherwise the small intestine is slightly congested.

"Small miliary tubercles are present in the liver in very large numbers. Liver weighs 3 lb. 4 oz."

(To be continued.)
Till now we have discussed such errors of refraction as may be corrected by means of a simple spherical lens, either concave or convex. The errors met with in practice are, however, very frequently not of this nature. Often we have to deal with one or other of the forms of astigmatism. This condition is caused by a want of symmetry of the cornea. Thus, if the horizontal meridian of the cornea has a radius of curvature of 8 millims, while the radius of the vertical is 7 millims, then rays of light entering by the vertical meridian will be brought to a focus before those entering by the horizontal. Thus no distinct image will be focussed on the retina, but only an indistinct blurred image. If we arrange a convex spherical and convex cylinder from the case of trial glasses, we shall find that no definite well defined image is formed. At two points, however, elongated linear images are formed in directions at right angles to each other. The one formed nearer the screen is due to the combined actions of the cylindrical and spherical lenses; the other is due to the action of the spherical lens alone. The rays converging to form this latter enter in the direction of the axis of the cylindrical lens, but the image is at right angles to that direction. This will be more clearly understood when the student has grasped the idea of what a cylindrical glass is, and therefore we delay its further consideration.

We have hitherto considered the cornea as spherical. In reality it is not so, but is, perhaps, of no fixed form. Certain it is that it sometimes varies so much as to become more or less conical, a state of matters constituting a special disease known as keratoconus or conical cornea. It is convenient, however, in ordinary circumstances, to regard the cornea, or at least the part of it opposite the pupil, as spherical, and in practice, except in those special cases just mentioned, we act as if it were. It is thus accurate enough to speak of the radius of curvature of the cornea or of a meridian of the cornea.

Again, astigmatism as met with is, for the most part, a corneal affection. It is, no doubt, conceivable that it may be due to a difference in curvature of the various meridians of
the lens. Still, although this sometimes happens, yet, as a rule, ophthalmic surgeons rarely take it into consideration; indeed, the more recent methods of measuring astigmatism by ophthalmometers are based on the assumption that the astigmatism is corneal.

Let us briefly remind our readers of the various forms of astigmatism:

(a) Simple Hypermetropic Astigmatism.—In this affection one of the meridians of the cornea has such a curvature as to make the eye for that meridian emmetropic, whilst another meridian, generally the one at right angles to it, is hypermetropic.

These two meridians are called the principal meridians of that cornea. All the meridians intervening between the emmetropic one (i.e., the meridian of maximum refraction) and the most hypermetropic meridian (i.e., the one of minimum refraction) are hypermetropic, but are so to a less degree than this principal meridian. The maximum and minimum meridians are generally in directions nearly at right angles to each other; and, as a rule, that of least refractive power is approximately in a horizontal direction. The student must remember, however, that this is not always the case. Sometimes the principal meridians are inclined to each other at a much more acute angle than 90°. We have measured one cornea in which the angle was only about 55°. Again, very frequently the meridians are not in the vertical and horizontal directions, but are much more oblique, lying more in the direction of 45°, and moreover the minimum refraction may be in the vertical instead of the horizontal. This state of matters is called astigmatism against the rule.

(b) Compound Hypermetropic Astigmatism.—Here all the meridians are hypermetropic, but one of the principal meridians is more hypermetropic than the other. The meridian of minimum refraction is the most hypermetropic, and that of maximum refraction is the least.

(c) Simple Myopic Astigmatism.—In this condition one principal meridian is myopic, the other is emmetropic. All the other meridians are also myopic, but not so much so as the one of maximum refraction—that is, the myopic principal meridian.

(d) Compound Myopic Astigmatism exists when all meridians of the cornea are myopic, but of the two principal meridians one is more so than the other. The more myopic of the two is the meridian of maximum refraction, the less myopic is that of minimum refraction.
(e) **Mixed Astigmatism.**—If one of the principal meridians is myopic and the other is hypermetropic, the condition is called mixed astigmatism.

(f) In most text-books a description will be found of *Irregular Astigmatism.* Probably the best way of describing this condition is to say that it simply means that the surface of the cornea is very irregular in curvature, and thus any meridian may have a different radius of curvature for each little portion of it. Thus after any diseased condition of the cornea involving a cicatrix we are very apt to have it.

Before describing the various methods which are generally employed for the detection and estimation of astigmatism, we think it right to describe very shortly the nature and uses of cylindrical lenses.

These, like spherical glasses, may be either convex or concave.

![Diagram](image)

In Fig. 15 we have represented a cylinder of glass, which is convex from side to side but not so from above downwards. Consequently rays of light striking it in a horizontal direction will be refracted, while those entering in the vertical direction will, to all intents and purposes, strike a surface of glass which has no curvature; they therefore will not be refracted. The amount of refraction depends upon the curvature of the cylinder, and the student will observe that if a beam of light strike the cylinder, the rays entering the various horizontal meridians will be brought to a focus in a line parallel with the axis—i.e., to form a focal line at right angles to the direction of the refracting surface. If now we remove from the side of the cylinder a small portion *abcd*, we have the simplest idea of a cylindrical lens. Its anterior surface is convex from side to side, but without curvature from above
downwards; its posterior surface is flat. A smaller portion
of this section of the cylinder may be ground so as to form
a lens, \( L \), which can be fitted into a spectacle frame. The
curvature of the surface of such a lens will be the same as
that of the cylinder, of which it is a portion, and the greater
the curvature—i.e., the smaller the radius of curvature—the
more strongly will it converge rays of light.

Fig. 16 gives the simplest idea of a concave cylindrical
lens. It will be observed that the lens is concave from side
to side, but is not so from above downwards. Again, a
portion of it, \( L \), may be cut out and fitted into a spectacle
frame. The concave cylinder diverges rays of light just
as the convex converges them. Thus, if a beam of parallel
rays strike a concave cylinder, those rays which strike it
in a direction at right angles to its axis pass out divergent,
just as if they came from a virtual focus. The virtual foci
caused by the divergence due to each little section of the
lens form a line parallel with the axis, but at right angles
to the plane of the refracting surface.

The student can easily verify this for himself. Let him
light a gas at one end of a room and then take a strong
cylindrical lens say + 5 D out of the trial case. If then he
holds the lens between this light and the wall at the other
side of the room, he will find that the light is focussed into a
horizontal line. This experiment is of some importance, for
most students are apt to get into confusion as to the axis of
minimum and maximum curvature in practice.

The uses of cylindrical glasses may best be explained as
follows:—Taking the simplest case, say one of simple hyper-
metropic astigmatism, we have to deal with a cornea, one
principal meridian of which is emmetropic and the other
hypermetropic. That which is hypermetropic has of course
less curvature than the other. It is therefore necessary to
cause rays of light entering by that meridian to converge
somewhat before they enter the cornea if they are to be
focussed at the same point as those entering by the emme-
tropic meridian. The amount of convergence required is of
course proportionate to the difference of curvature of the two
principal meridians. Now, if a cylindrical glass of proper
strength be taken—i.e., one whose converging power is equal
to the difference of the converging powers of the two
meridians, and if it be held before the eye in such a way that
its axis coincides in direction with the corneal meridian of
greatest curvature, then the direction of its curved surface
corresponds with the corneal surface of least curvature. We
intend giving a number of examples of astigmatism from our own case-book, when the student will better understand the question of the direction of the axis of cylindrical lenses.

Like spherical lenses, cylindrical may be numbered either according to refractive power or according to focal length—i.e., in dioptres or in inches and centimetres. In recent years the numbering by focal length has gone almost entirely out of use. In the dioptre scale we find the following numbers convex and concave—viz., 0·25, 0·50, 0·75, 1, 1·25, 1·50, 1·75, 2, 2·25 2·50, 2·75, 3, 3·5, 4, 4·5, 5, 5·5, 6. The methods already explained for connecting readings in dioptres into focal readings in inches or centimetres apply as well to cylindrical lenses as to sphericals. Thus a glass of 5 D is equal very nearly to a glass of 8 inches or 20 centimetres.

With these remarks we are now in a position to describe the measurement of astigmatism. Just as there are three ways in which we may measure hypermetropia and myopia, so there are three ways in which we may measure astigmatism—viz., the direct method with the refraction ophthalmoscope, the shadow test, test types with trial glasses. There are several other methods frequently employed, but these three are the tests generally useful. Before passing, however, to a discussion of the binocular movements of the eyes, we shall take occasion to show how the presence of astigmatism may easily be detected by the indirect method of examination.

The Direct Method.—We have already seen that when rays of light enter a cornea which is astigmatic, those entering by one meridian have a different focus than those entering by another. The same phenomenon takes place when rays leave the cornea. If one principal meridian is emmetropic, then the rays leaving by that meridian emerge from the cornea practically parallel to each other. If the other is hypermetropic then the rays emerging by it leave the refracting surface divergent, the amount of divergence depending on the amount of hypermetropia. Again, if both meridians are hypermetropic, but one more so than the other, then the rays leaving by the meridian, which is the more hypermetropic, are more divergent than those leaving by the other. If both principal meridians are myopic, but one more so than the other, then the rays leave both converging, but those passing out by the more myopic meridian are more convergent than the others. In mixed astigmatism the rays leaving by the myopic meridian are after refraction convergent, whilst those emerging by the hypermetropic one are divergent.
The refraction ophthalmoscope gives us a method of estimating the difference of convergence or divergence, and hence affords a means of estimating the astigmatism. Indeed, so eminent an authority as Landolt is of opinion that it is the best method. Still, whatever the result may be, it should always be checked by an examination with trial glasses and suitable types. Judging from our own experience, we prefer the shadow test if carefully done, with subsequent verification with trial glasses. Examination with the shadow test is apt to give the examiner a bad habit of neglecting to inspect accurately the fundus oculi. One is apt merely to ascertain approximately the state of the refraction from the shadow, and to rest content with this—thus, important pathological changes of the fundus may be overlooked altogether.

In using the refraction ophthalmoscope for this purpose, the patient and the lamp should be arranged just as in estimating hypermetropia or myopia by the same method.* If the observer is ametropic he should use a pair of spectacles with the correcting lens, or else correct the results got by his measurement for the amount of his own error. It is specially of importance that the accommodation both of the patient and of the surgeon should be completely at rest, or as near it as possible. This is best effected by the surgeon keeping both eyes open, and the one parallel with the other, and by the patient looking at an object at least 20 feet away. It must be remembered that in astigmatism we are very apt to have the accommodation in somewhat vigorous action, hence the necessity of extra precaution. The ophthalmoscope also should be held as nearly as is convenient at the distance from the eye which the lens of a spectacle would occupy.

With this arrangement the examiner now illuminates the fundus, first beginning without any lens behind his ophthalmoscope, taking care to keep his own accommodation at rest. If he is unable to see clearly, and in absolute definition, any detail of the fundus, and if the media are of normal transparency, the eye must as a whole be either hypermetropic or myopic. If the slightest use of his accommodation, or the rotation in of one of the convex glasses behind the ophthalmoscope enables him to see the fundus, then whatever astigmatism there may be the eye must be hypermetropic. If, on the other hand, a concave glass must be placed behind the ophthalmoscope, then the eye is, generally speaking, myopic. Suppose, however, that with both the observer's

accommodation at rest and that of the observed eye, and that the surgeon can clearly see one of the vessels, the meridian of the cornea at right angles to that vessel must be emmetropic, or very nearly so, always provided that the surgeon is emmetropic, or has made himself so at the time of the examination. If the eye is astigmatic, then the vessels at right angles to the one seen distinctly must appear out of focus so long as the above conditions of examination are adhered to. Let one of these vessels be carefully focussed by the rotation in behind the mirror either of the various convex or concave glasses. The strongest convex glass, or the weakest concave, is the one which shows the error of refraction of the meridian at right angles to that vessel. Thus, suppose it is brought into focus by a convex 2 D, and that the strongest convex with which it is seen is 3 D, we conclude that we are dealing with a case of simple hypermetropic astigmatism of 3 D. Had we been unable to improve its definition by a convex glass, we would have tried a concave. If the weakest concave with which we could see the vessel were 1 D, then we would have inferred that we were dealing with myopic astigmatism of 1 D.

Again, suppose that, with the above mentioned conditions of examination, none of the vessels were in accurate definition, but that the fundus became clearer on the use of convex glasses, let the horizontal vessels become clear with a + 3 D, but rather less distinct with a + 4, we would infer that the vertical meridian is hypermetropic to about 3 D. Then, if a + 5 glass brought the vertical vessels into absolute focus, but a + 6 made them somewhat indistinct, then we would know that there is about 5 D of hypermetropia in the horizontal. Here we have 3 D hypermetropia in one meridian and 5 D in the other—i.e., 2 D more in one than in the other. This we would try to correct with a spherical + 3 combined with a cylindrical + 2, the axis of the cylindrical element being placed vertically.

The same principle is also applicable to the measurement of compound myopic astigmatism. Suppose that to make the fundus distinct we had to use concave glasses. Then the weakest concave glasses with which we see the various vessels affords us a measurement of the amount of myopia or of myopic astigmatism. Thus, suppose the weakest concave glass with which we can bring into accurate focus vessels in what we have termed the N.W. direction is concave 4 D, then we know that there is myopia of about 4 D in the meridian of the cornea at right angles to that. If, however,
we require to use a concave 8 D before we see the vessels in the N.E. direction, we would know that the meridian of the cornea at right angles to that direction has myopia 8 D —i.e., 4 D more than the other. This is then a case of myopic astigmatism, which we would try to correct with $s - 4 \text{D} = cly - 4 \text{D}$, axis of cylinder in the N.E. direction. The amount of astigmatism is $8 - 4 = 4 \text{D}$.*

In certain cases some of the vessels in the fundus can be focussed with a convex glass, while those in a direction approximately at right angles to it can only be focussed with a concave glass. The strongest convex glass with which the vessels that are focussed by the convexes can be seen measures the ametropia of the corneal meridian at right angles to the direction of these vessels. Again, the weakest concave with which the vessels only seen by the concaves can be focussed measures the ametropia of the corneal meridian at right angles to the direction of these vessels. Thus, suppose the convex glass was 1 D and the concave 2 D, the amount of astigmatism would be 3 D, and we would endeavour to correct it by a double cylindrical lens ($cly + 1 = cly - 2$), carefully adjusting the axes, so that the positive element corrects the hypermetropic meridian and the concave the myopic.

We cannot insist too strongly on the conditions necessary for a successful estimation of ametropia by this method. These are that the examiner should either be emmetropic or render himself so at the time of the examination, and that the accommodation both of patient and surgeon should be relaxed as much as possible. Care should also be taken that the vessels selected as test objects in the fundus are the smaller vessels, not the large trunks. Some surgeons very frequently use the edges of the disc as the test object. Its borders running vertically may be seen with a different glass than its horizontal edges. No doubt in this way very good results may be obtained, but we personally prefer to use the vessels as our test.

The shadow test is to our thinking an excellent method of estimating astigmatism. It is not very difficult of execution, and, as a rule, gives good results. The patient and the room should be arranged as for the measurement of hypermetropia or myopia by this method.†

We shall again describe the phenomena as for an ophthalmoscope with a concave mirror.

* $s$ stands for spherical and $cly$ for cylindrical.
MR. FERGUS—Examination of the Eye.

If, then, the surgeon standing at 4 feet from his patient throws a beam of light into the eye with his ophthalmoscope, and rotates the mirror first round its vertical axis and then round its horizontal, he will observe the light in the patient’s eye to move also. The meridian in which the light moves may coincide absolutely with the direction in which the ophthalmoscope moves, or it may be somewhat oblique. If the latter, there can be no doubt as to the eye being astigmatic; if the former, it does not preclude the idea of astigmatism. Let us again remind the student that if with a concave mirror the light in the patient’s eye moves in the opposite direction to that of the rotation, then the meridian so examined is either hypermetropic, emmetropic, or very weakly myopic. If the movement be in the same direction, then the meridian so examined must be myopic. The directions for correcting the various meridians are just the same as for correcting simple hypermetropia and myopia.

If in all the meridians the shadow moves against the rotation of the mirror, then we put the various numbers of the convex glasses from the trial case into a frame on the patient’s face, beginning with the weaker numbers. Suppose we find that in a meridian nearly vertical the shadow is turned—i.e., moves with us with a convex 3 D in front of the patient’s face, we know we have over corrected that meridian, and that it has about 2 D of hypermetropia. If the shadow move against us still in the horizontal we go on with the series of convex glasses till we get one which turns the shadow. Let this be + 5 D. We know that there is hypermetropia of about 4 D in the horizontal. Thus we find an astigmatism of about 2 D. The proper correction would be approximately \( s + 2D = clg + 2D \).

If in any meridian the shadow moves against us with a convex mirror, but the direction is changed with a convex glass weaker than + 1 D, then most likely there is weak myopia in that meridian. If with a + 1 D, then it is not far from emmetropia.

Myopia is estimated in the same way. We judge of the amount which turns the shadow. Thus, if in the vertical meridian the light has been moving with the mirror, but moves against it when a \(- 5\) D glass is put in the frame in front of the patient’s eye, we expect to find that that meridian is myopic to 5 D or a little more.

Well marked cases of mixed astigmatism are very characteristic. In one meridian the shadow moves against us, in the other with us. There is no quicker or better method of
ascertaining the presence of mixed astigmatism than the shadow test.

In our next paper we will discuss the estimation of astigmatism by trial glasses, the position of the lenses, certain peculiarities of the shadow, and diagnosis by the indirect method.

THE PATHOLOGY OF MEDIASTINAL TUMOURS, WITH SPECIAL REFERENCE TO CLINICAL DIAGNOSIS.

By JOHN LINDSAY STEVEN, M.D., Assistant Physician and Pathologist, Glasgow Royal Infirmary.

(Continued from p. 42.)

HISTOLOGY AND ETIOLOGY OF MEDIASTINAL SARCOMA.

In concluding what has been written on the subject of the lympho-sarcomata of the mediastinum, it is only necessary to make a very few remarks upon their histological structure and etiology. Including the specimens contained in the Museum of the Glasgow Royal Infirmary with those cases fully recorded in the present essay, I have now made microscopical examinations of a considerable number of these tumours, and in all of them I have found a wonderful uniformity in minute structure. Their histology is very simple, and requires but little description. In every part of them are found closely aggregated masses of small, round, or sometimes slightly oval-shaped cells, which have been usually denominated lymphoid cells, from their similarity to the cells found in the tissue of lymphatic glands. The cells are held together by intersecting fibrous bands, and by a capsule, which is intimately related to the cellular tissue beneath it, so that it cannot be stripped from the surface of the tumour, and which seems to grow with the increasing growth of the neoplasm. In a number of cases between the individual cell elements, or small groups of cells, a delicate reticulum can often be made out, similar to that of a lymphatic gland, but in a great many cases the heaping together of the lymphoid corpuscles is so great that no reticulum can be distinguished. Tissue of such a structure is likely to possess but little cohesive power, and when cut into many of the tumours give exit to a creamy juice, and present a soft encephaloid appearance. Thin-walled blood-vessels are frequently found in the midst of the tumour tissue, and often the capsular tissue is
seen to be well supplied with capillaries, around which considerable cellular exudation has taken place, a circumstance which may possibly have something to do with the extension of the tumour and the growth of its capsule. In one or two instances I have met with microscopic exudations of red blood corpuscles in the substance of the tumour, evidently the result of hæmorrhage from ruptured capillaries. In examining structures, which are in process of being replaced by the lympho-sarcomatous tissue, the elements proper to the structure are seen to be separated from one another, and surrounded, by the small round-celled growth, and undergoing gradual atrophy and ultimate destruction. This is very well seen in the case of the bronchial tube, where the cartilage may be seen surrounded and broken in upon, the muscular elements separated from one another, and the submucous tissue entirely infiltrated, by the advancing and all-powerful lymphoid corpuscles. In the same way venous walls may be incorporated, and polypoid projections into the lumen of the vein formed. The tissue of the secondary nodules, which are liable to be formed in various organs in the progress of the disease, present a structure in all respects similar to that of the primary growth.

In fact, from the histological structure alone, such tumours might quite well be called round-celled sarcomata, from which indeed there is little in their microscopic appearance to distinguish them. The tumours are really round-celled sarcomata, but they are sarcomata of the lymphatic glands of the chest, and hence I prefer to call them lympho-sarcomata—a name not founded on histological structure alone. The days are now gone when it was customary to classify tumours, at least in their clinical and prognostic relations, according to the microscopic structure alone, or the alleged specific character of a cell. The whole pathology of the growth must be taken into account in classifying a tumour, and in this histology merely plays a part, though no doubt an important part. In examining a large number of sections from different parts of lympho-sarcomatous tumours, the question of endothelioma occasionally presents itself for consideration. As endotheliomata, however, are tumours which in their minute structure present a close similarity to cancer, I shall defer the discussion of such neoplasms till the consideration of cancer of the mediastinum is taken up.

With regard to the etiology of lympho-sarcomata of the mediastinum, I feel that I can say very little. The subject is a most difficult one, and as yet it is impossible to come
to any very definite conclusions on the matter. By some these tumours have been compared to and included among the specific new formations or infective tumours, thereby indicating an opinion that their primary cause is likely to be similar to that giving rise to this class of affections.* I do not think, however, that we have sufficient evidence to enable us to formulate definitely such a view as to the origin of the lympho-sarcoma. Perhaps the most convenient disease with which to compare and contrast mediastinal lympho-sarcoma, in discussing this aspect of its etiology, is tuberculosis. In the tubercular new formation we have the most characteristic specific and infective process—a typical virus disease, both in its histological and etiological aspects. In tuberculosis the presence of a particulate virus, the effect it produces on the elements of the tissue in which the poison settles, and the changes that occur in the affected areas in the course of the disease, are all perfectly and accurately known. It is not so with regard to the causation of mediastinal sarcomata, and it seems to me, from my study of such tumours, that there is little in their life-history to suggest an etiology at all comparable, at least in its ultimate details, to that of tuberculosis or any other specific tumour. In tuberculosis we have to deal with an activity in the elements of the affected tissue—a morbid activity, no doubt—caused by the stimulus exerted upon them by the particulate virus. This activity is not one confined to a particular element or a particular tissue, but takes place in all tissues that are subjected to the influence of the virus, and leads to the same result in all. In the growth of a lympho-sarcoma we have nothing at all comparable to this. We have here nothing to suggest the influence of a poisonous agent on the nutrition of the tissues in which it is present, but we have to deal with the growth (and as regards the tumour itself, it may be said, a normal growth) of a new tissue, which exerts upon neighbouring tissues no nutritional influence at all, but simply causes them to disappear. So long as a portion of the tissue invaded by the new growth remains, it presents its normal characters, can be recognised by these characters, and shows no trace of unhealthy nutritional processes going on in it. This, then, is something very different from the effect of a specific virus on a tissue—it is, in fact, the effect and growth of an absolutely independent neoplasm. From these remarks it will be seen that, in my opinion, the cause of lympho-sarcoma of the mediastinum is likely to be

precisely similar to that which gives rise to other forms of simple or malignant tumours. Many observers have worked, and are working, at this obscure but most important subject; but, until something definite results from their labours, we must be content to wait for an explanation of the starting-point of these tumours of the mediastinum, which have at some length occupied our attention. A discussion on the etiology of tumours in general would manifestly be quite out of place in an essay like this. With regard to the other aspects of the etiology of mediastinal sarcoma, as I have already in some detail expressed my views as to its relationship to Hodgkin’s disease, it is unnecessary to say anything more.

II.—Cancer of the Mediastinum.—As I have already indicated, I do not believe that primary cancer is anything like so frequently met with in the mediastinum as sarcoma, and especially as lympho-sarcoma. I hold to this belief in spite of the statistics advanced by Hare, for the reasons which I have already urged. Cancer is a disease which can only originate, except in very rare and exceptional circumstances indeed, in connection with epithelial tissues, and more particularly in those epithelial tissues which are specially prone to injury or irritation, such as those covering the lip, the pylorus, the os uteri, &c. For this reason the most likely place for a primary carcinoma to develop within the chest is the posterior mediastinum, where we have the epithelial structures of the trachea, bronchi and oesophagus, to afford a starting-point for the disease. To say with Hare that “undoubtedly the lymph glands at the base of the neck, or those which accompany the trachea and bronchi, are frequent seats for its beginning” is, in my opinion, undoubtedly erroneous; and I imagine that few, who accept the teachings of modern pathological anatomy, will accept the following statements as to the place of origin of mediastinal carcinoma:—“The lymph tissues at the root of the lungs, the pericardium and sub-pericardial connective tissue, the periosteum of the sternum, the fat and connective tissue of the mediastinum: and, last of all, the adventitia of the blood-vessels may give rise to the growth.” * A sentence like this simply amounts to saying that cancer may originate in any of the numerous tissues which go to make up the entire organism, and that it follows no special type of tissue-structure, epithelial or other.

ENDOTHELIOMA.

It must be accepted, however, as a fact that occasionally tumours, having all the characters, macroscopic and microscopic, of typical cancer, seem to develop in connection with tissues which are not of the epithelial type. Such tumours have been described as occurring in the pleura and peritoneum, although they are admittedly rare, and to this class of neoplasm the term *endothelioma* has been applied. I think, too, that those tumours which have been described as *alveolar sarcoma* might also be placed in the same class. In these cases the histological structure of the growth is indistinguishable from that of cancer, and there would be little difficulty in calling the tumour cancer, were it not for the fact that it had originated in a non-epithelial tissue—*e.g.*, the pleura or peritoneum. In the course of my own practice I have not met with a case that could be regarded as coming under the category of the rare tumours just referred to, but in 1888 I saw Dr. Joseph Coats perform a *post-mortem* examination of a case of primary cancer of the pleura, which has since been fully recorded by that gentleman.* Such tumours of the pleura have been generally looked upon as originating from the endothelium of the lymphatic vessels of the part, but Dr. Coats regarded the tumours in his case as having arisen from the surface epithelium or endothelium, rather than from the lymphatics in the substance of the membrane. As one would naturally expect, from the character of the pleural membrane, primary cancerous tumours of this structure are likely to be multiple, and to be of moderate rather than of very great size. In the face of such facts, too, the possibility of cancer primarily originating in other than the epithelial tissues of the mediastinal space must also be admitted, although this must be an occurrence of the rarest kind. In the course of my microscopic examination of the cases of mediastinal lympho-sarcoma preserved in the museum of the Glasgow Royal Infirmary, I came across one case which might possibly have been classed as endothelioma, or perhaps more accurately as alveolar sarcoma, or *sarcoma carcinomatosa* (Virchow).† In this tumour the alveolar arrangement of the connective tissue stroma of the growth was very perfect, and presented a very striking resemblance to the alveolar stroma of carcinoma. The cells, however, which were contained in the alveoli were not characteristic.

† Glasgow Royal Infirmary Museum, Series X, 230, 231.
epithelial cells, being smaller, and following more closely the connective tissue type. For this reason, and also because the macroscopic characters and the relationships of the growth to the neighbouring structures were precisely those observed in other cases of lympho-sarcoma, I preferred to class the tumour under this heading. Another reason which made me keep this tumour among the sarcomatous formations was that in some parts the structure was undoubtedly sarcomatous—of such a nature that the question of any cancerous element could not for a moment be considered. While at some parts the minute structure very closely resembled carcinoma, at others abundant small oval and spindle-shaped sarcomatous cells, without a trace of stroma, were characteristically present. This was the only case in which the question as between cancer and sarcoma came up for serious consideration; but occasionally in examining other cases a tendency to endotheliomatous structure may be observed, although not in such a way as, in my opinion, to cause any difficulty in classifying the growth. In concluding these remarks on the subject of endothelial tumours, I think the following sentence, contained in Dr. Coats' record of the case of primary cancer of the pleura, should be quoted, from the bearing it has upon the etiology of such neoplasms, although I do not know that I am prepared to admit the suggestion at least in the case of mediastinal growths. He says:—"There seems no good reason for separating this form from the proper cancers. In structure there is a complete correspondence. It may even be that, as Balfour asserts, the pleura and peritoneum may be derived from the primordial body cavity, and so may be hypoblastic in origin." If the hint as to the primordial origin of pleural and peritoneal serous membranes contained in this sentence be at all accurate, then the exception, which endotheliomatous tumours seem to present to the rule that all cancers originate in connection with epithelial tissues, may be more apparent than real. Granting, however, that the pleura and peritoneum are in no sense to be regarded as of hypoblastic origin, then endotheliomatous tumours, such as those at present referred to, might be taken as affording proof of Cohnheim's theory of the origin of neoplasms—viz., that tumours originate from a piece of tissue left over in the process of development, and retaining all its embryonic powers of growth. Endothelial growths are also met with in the region of the umbilicus, and I have seen two or three specimens of this kind exhibited

* Loc. cit., p. 22.
at the Glasgow Pathological and Clinical Society, where the question as to whether they were cancerous or sarcomatous was vigorously discussed. An interesting case of the kind has been placed on record by Mr. D. N. Knox, in which it was probable that the cells filling the alveoli of the tumour originated from the peritoneal endothelium.* I have thus discussed at some length the question of endothelioma of the mediastinum, in order to show that, while strongly of opinion that cancerous tumours of this region, in the great majority of cases, originate in epithelial tissues, I am still aware of the difficulties which apparently cancerous tumours, not so originating, raise. I think it not at all improbable that very often the appearance of a cancerous tumour in the mediastinum may be caused by a sarcoma forming a stroma for itself out of the loose connective tissue amongst which it has frequently to grow.

Having thus explained my reasons for believing that primary cancerous tumours of the mediastinum are most likely to take origin in the posterior portion of this region, either from the epithelial tissues of the respiratory passages or the oesophagus, I shall in the next place relate a case in which the tumour commenced in the right bronchus, after which I shall give an account of one or two cases of oesophageal cancer that have recently come under my observation.

CASE 8. Primary Cancer of the Mediastinum originating in the Tissue of the Right Bronchus, with Secondary Subcutaneous Tumours, presenting the usual Physical Signs and Symptoms of Phthisis Pulmonalis.—Robert D., aged 24, a vanman, was a patient in the Glasgow Royal Infirmary under the care of Dr. Samson Gemmell, and the following summary of the clinical history was sent to me at the time of the post-mortem examination, which I performed upon the 10th February, 1880. The symptoms from which the patient suffered, and the physical signs in his chest, led to a diagnosis of phthisis pulmonalis. He was admitted labouring under a cough and spit of about nine weeks' duration, and loss of flesh and weakness of four weeks' duration. Expectoration was profuse, night sweating very marked, and diarrhoea troublesome. A tumour the size of a small orange was situated on the front of the right shoulder, and another about the same size was found in the abdominal wall. Percussion over the

* Glasgow Medical Journal (January to June, 1885), vol. xxiii, pp. 136 and 308.
right apex in front was quite dull, the respiratory murmur was tubular, and there were crepitant râles. The left lung seemed to be normal. Posteriorly, percussion was dull all over the right lung; the respiratory murmur was tubular at the apex, and there were muco-crepitant râles at the base. There had been no hemoptysis till 15th January, and then it was only slight. The sputum was nummular, the urine was normal, and the temperature was markedly hectic.

The report of the post-mortem examination was in the following terms:—

External Appearances.—There is a marked deformity of the chest-wall. In the right lumbar region of the abdominal wall is a firm rounded tumour; and a similar smaller, but harder, rounded mass, about the size of a small orange, is situated on the front of the right shoulder.

Chest.—The anterior margin of the right lung is firmly adherent to the sternum. On opening the pericardium one or two moderately recent adhesions are found between the surface of the right ventricle and its parietal layer. The heart is somewhat dilated, and all its chambers are filled with clot; the muscular tissue is somewhat pale and rather soft, but otherwise the organ presents nothing abnormal.

The right lung is firmly adherent over its whole surface, diaphragmatic as well as costal. It is solid from apex to base, the consolidation for the most part presenting somewhat the characters of grey hepatisation, with here and there distinct nodules presenting features somewhat similar to those of caseous or catarrhal pneumonia. Surrounding the right bronchus, where it runs into the lung, is a hard, pearly white mass, which encroaches upon the pulmonary tissue of the root of the lung. Where this mass involves the lung its tissue presents a caseous appearance, and was at first regarded as caseous bronchial glands. In the anterior aspect of the upper lobe a large ragged cavity is discovered, into which projects at one point the white tissue already described as involving the root of the lung. The apex of this lung is capped by a greatly thickened and somewhat œdematous pleura.

The left lung is somewhat œdematous in its lower lobe; its upper lobe is much shrivelled and contracted by old fibroid change; and at the extreme apex is an old cavity about the size of a hazel-nut, lined with a well defined membrane, and nearly full of pultaceous material of a greenish colour.

On removing the tumour from the shoulder and abdominal wall, the naked eye characters are found to be essentially similar to those of the mass of pearly white tissue at the root
of the right lung. The primary and secondary tumours from this case have been preserved in the museum of the Glasgow Royal Infirmary.*

Abdomen.—The kidneys are somewhat pale, but otherwise present nothing special. The capsule is perhaps slightly adherent in both organs. The liver shows the lobules with undue distinctness, and this is probably due to slight fatty or hyperaemic change. The spleen presents nothing unusual. The intestines are examined, but no ulcers are found. The mesenteric glands are not enlarged. The stomach and pancreas present healthy appearances.

On microscopic examination of sections of the primary tumour in this case, it is at once seen that the growth is a typical cancer, the tissue being composed of masses of epithelial cells embedded in a characteristic alveolar stroma. On examining a large number of sections in order to settle more definitely the precise nature and origin of the cancerous growth, it soon becomes apparent that the neoplasm has originated in connection with the acinated bronchial mucous glands. The appearances observed in some of the sections leave no doubt whatever on this point, because in them the irregular alveolar epithelial tissue of the tumour can at places be seen to be in direct continuity with a more or less normal-looking bronchial glandular tissue, as if the section had been taken just at the point where the normal cells were beginning to break bounds. Precisely the same relationship of normal epidermis to tumour elements is often seen in cases of epithelioma of the lip. This relationship of the definitely cancerous tissue to tissue more or less normal in character was often very striking, and led one to think that some hypertrophy, or at least nutritive activity, of the normal gland structure had taken place before it had finally broken away altogether into independent cancerous development. That the cancerous growth had nothing whatever to do with the bronchial epithelium was abundantly evident in many of the sections, where the whole thickness of the bronchial wall could be carefully studied. The columnar superficial epithelium, the basement membrane, the sub-mucosa, and the muscular layers could all be made out with ease; and it was evident that the tumour formation had no relationship whatever to them. Beyond the evidences of considerable bronchial catarrh, shown by the proliferation of the surface epithelium, the thickening of the basement membrane, and a considerable infiltration of leucocytes in the sub-mucosa, these structures

* Glasgow Royal Infirmary Museum, Series X, 172 A and 248 A.
of the bronchial wall presented tolerably normal characters. Here and there the tumour tissue encroached upon the muscular and mucous layers of the bronchus, apparently even penetrating it at a few points; but, on the whole, these layers were little affected, the growth of the tumour seeming rather to have expended itself in an outward direction towards the peribronchial tissues. The primary tumour in this case, then, might be called a glandular cancer of the bronchial wall.

Microscopic examination of the subcutaneous tumours shows that they possess a typically cancerous structure, being composed of large processes of well formed nucleated epithelial cells. The processes, which have a distinctly epitheliomatous character, vary greatly in size and shape, and are separated from one another by a well formed stroma, containing numerous spindle-shaped nuclei. The secondary tumours are, as regards their minute structure, perfect reproductions of the fully formed tissue of the primary growth—that is to say, the tissue of the secondary tumours has followed the type of the structure of the primary tumour at the point where that structure has diverged most widely from the normal structure from which it started. Some parts of the primary tumour are almost identical in structure with that of the secondary growth; but those parts of the primary growth, which follow most closely the type of the normal bronchial gland, have no corresponding structure in the secondary tumours. Both in the primary and the secondary tumours, but especially in the secondary, numerous laminated capsules are present. In one of the sections examined a bronchial lymphatic gland was found to have been included. It showed signs of irritative proliferation of its elements, but careful examination failed to detect any cancer elements in its tissue.

The case just recorded must be regarded as a good example of a simple primary cancer of the posterior mediastinum, originating in connection with the root of the right lung; and although, in the light of the completed record, the whole relationships of the different parts of the case are easily appreciated and understood, it must also be admitted that, both during life and at the time of the post-mortem, the features, upon which one had to depend for a diagnosis, were obscure and misleading. During life the symptoms and signs were regarded as those of phthisis pulmonalis, nor was there anything in the general condition of the patient that was not perfectly in keeping with such a view. No doubt the sub-
cutaneous tumours, if their significance could possibly have been interpreted aright during life, might have led to an accurate opinion; but, in face of the fact that even at the time of the post-mortem I took a wrong view of the relationship of the subcutaneous tumours to the lesion within the chest, it would seem to be almost impossible that the true interpretation of such tumours could have been arrived at, except on the ground of comparison with a precisely similar case having already occurred in the experience of the physician. Hence the importance of the present record in view of future diagnosis. What tended still further to complicate the diagnosis in the present case was the fact that along with the cancerous disease there was also quite characteristic phthisical disease, of the left lung at least. It was evident, however, that the tubercular element was quiescent, and that the lesions in the left apex were in process of healing. Had it not been for the cancer the patient might have thrown off the phthisis.

It is also worthy of remark that the cancerous disease had excited a very intense inflammatory action in the pulmonary parenchyma, a point of interest in connection with the well known tendency of malignant tumours of the chest to excite pleurisy and pericarditis, already adverted to in these pages at some length. It would seem that the growth of a primary cancer at the root of the lung can set up a wide-spread grey hepatisation, as actually occurred in the case just recorded. Cancers of the posterior mediastinum, and particularly those originating in connection with the oesophagus, are not unfrequently associated with the development of gangrenous cavities in the lungs. This is a condition which may arise partly from involvement of the pulmonary plexuses of nerves in the malignant mass, and partly from the cancerous growth involving the bronchial tube, and so, by insufflation or otherwise, setting up necrotic processes in the pulmonary tissue.

I have said that even at the time of the post-mortem examination I misinterpreted the significance of the subcutaneous tumours. I mean that at first I looked upon the superficial tumours as primary and sarcomatous, and upon the mediastinal lesion as secondary; and my original report of the case was entered in these terms. When the specimens came to be minutely examined, and when microscopic investigation had been undertaken, it became at once plain that such an opinion was erroneous. When the examination of the case was completed it became clear that the lesion in the mediastinum was primary, that on the surface of the body
secondary. No doubt there were features in the case which were in my experience unusual, and which rendered it more easy for me to fall into the error I did. I was not prepared to find secondary cancerous tumours, such as those in the present case proved on examination to be, so completely isolated and alone—i.e., apart from secondary tumours elsewhere. When general metastasis of cancer takes place it is generally multiple—numerous, sometimes very numerous, secondary formations being developed. In this case it was not so; and, except the two tumours that have been described, no others were found. It would seem, however, that this limited secondary extension is perhaps not so uncommon in connection with primary cancer of the lung as I at first supposed. Dr. Coats in his book refers to a case in which a very peculiar secondary extension occurred to the bones and the brain.*

A much more frequent starting-point for primary cancer of the posterior mediastinum is the epithelium of the oesophagus; but cancerous disease of the gullet is a lesion so easily diagnosed as a rule, and gives rise so constantly to dysphagia, more or less severe, that we have come to regard the affection more from the point of view of the difficulty of swallowing than from its anatomical location in the posterior mediastinum. In order, however, to give completeness to this part of the subject, I propose to relate two cases of malignant stricture of the gullet that have recently come under my notice, one of which happens to be of very unusual interest. The first of these occurred in the Throat Ward of the Glasgow Royal Infirmary, under the care of my colleague, Dr. David Newman, with whom I was associated in bringing the case under the notice of the Pathological section of the Glasgow Medico-Chirurgical Society in December, 1890. I shall here quote Dr. Newman's account of the clinical history, and give my own report of the post-mortem examination.

CASE 9. Epithelioma of the Oesophagus at the Level of the Bifurcation of the Trachea—Ulceration and Rupture into the Aorta—Death from Hæmorrhage into the Stomach and Duodenum.—"G. A., âet. 57, was admitted into the Glasgow Royal Infirmary on the 25th March, 1890, complaining of difficulty in swallowing, which, he said, commenced at the beginning of December, 1889.

"The first difficulty he experienced was in swallowing

solid food, and this gradually increased until the middle of February in the present year, when he had to give up taking solids, and since that time his diet has been composed entirely of liquid food. During the act of swallowing he feels as if the difficulty in deglutition was caused by constriction at the level of the cricoid cartilage, but once the bolus has passed that point it occasions him no trouble, nor has he ever suffered from vomiting, cough, alteration in the voice, or pain. The pupils are equal, and the radial pulses are synchronous and equal in force, although somewhat weaker than normal. On passing a bougie (No. 16), a complete obstruction is met with, 13 inches from the teeth, so that the stricture of the oesophagus may be said to be situated between the level of the suprasternal notch and that of the bifurcation of the trachea. The largest size of bougie which passed through the stricture was a No. 6. On enquiring into the history of the case, no evidence could be found to show that the patient at any time suffered from syphilis, or sustained any traumatic injury to the oesophagus. On palpating the neck, nothing abnormal could be discovered in the line of the gullet nor in the lymphatic glands. The larynx and trachea, as far as could be seen, were strictly healthy, but on the least exertion the patient suffered from well-marked dyspnœa.

"Physical examination of the chest shows the cardiac sounds to be pure, but feeble, and very irregular in rhythm; but there is no evidence of valvular disease. I did not examine the condition of the lungs critically, but posteriorly, in the interscapular space and to the left side of the spine, on a level with the fourth dorsal vertebra, and, extending upwards and downward from that point, there could be detected a distinct localised dulness, occupying an area of about three or four square inches. Associated with this dulness to the left side, and about the same level as the obstruction in the oesophagus, there was evidence that air was not entering the left lung so freely as the right.

"The patient was sent to Dr. Jas. Wallace Anderson, who kindly furnished me with the following report:—'The upper left front of the thorax is slightly retracted, and there is a corresponding diminution of expansion, there also being a rather increased resonance on percussion over the same area. The respiratory murmur over this area is less full and free than on the right side, at some points being hardly audible, at others of a whiffing, wavy character, but always faint.' . . . . 'Posteriorly there is a mere suspicion of
dulness in the upper left interscapular region. The respiratory murmur is distinctly fainter on the left side at the level of the third, fourth, and fifth dorsal vertebrae, and this diminution is continued one or two vertebrae lower on that side. The respiratory murmur over the left lung generally, though quite audible, is fainter than on the right side. There is no alteration in the vocal resonance, and no râles are heard anywhere. Cardiac phenomena and circulation generally are all perfectly natural.'

"At this time (1st April) I was quite satisfied that the case was one of cancer of the oesophagus, but as there was no demand for surgical interference I transferred the patient to Dr. Wallace Anderson's care. During his residence in Dr. Anderson's ward he was kept at rest in bed, and as a result of treatment the symptoms became less pronounced, and the patient desired to be dismissed, and to return to his ordinary employment. Between the 1st of April and the 24th of May great improvement took place in his power of swallowing, and he gained in weight, so that when he was dismissed he was able to swallow not only fluids with freedom, but, with a little care, solid food as well. This improvement, with freedom from pain in swallowing, and the absence of vomiting, emaciation, or anemia led me to doubt the accuracy of my first diagnosis, and consider whether or not the dysphagia and impaired respiration on the left side might not be due to the presence of an aneurism or solid tumour at the bifurcation of the trachea. A large-sized bougie now passed with ease. During the summer months the patient enjoyed moderately good health, and was able to swallow well both fluid and semi-fluid food; but in the autumn he again began to suffer from dysphagia, and he stated that since he was dismissed from the Infirmary he suffered greatly from breathlessness.

"Patient was readmitted into my ward on the 7th October. On passing a bougie (No. 12) it was found to be impossible to get it passed 13 inches from the teeth. At this time I went over the case very carefully again, and found the patient to be very much in the same condition as in April, except perhaps he suffered more from dyspnoea, and I made a note in the journal to the effect that "although there are no positive signs of aneurism, the situation of the obstruction, the dyspnoea, the impaired respiration on the left side, the area of dulness posteriorly, and the history of the case, raise the gravest suspicion of an aneurism at the bifurcation of the trachea." On the 18th October the patient spat up a
small quantity of dark blood, and for the first time complained of pain in the chest. On the 28th he again suffered from a deep-seated gnawing pain in praecordial region, and when I saw him in the morning he was looking very ill. At one o'clock on the following morning the patient raised himself in bed suddenly, because of some distress referred to the chest. Immediately he sank back on the pillow and became blanched, his pulse at that time being small and thready, and a few minutes afterwards almost imperceptible, while he continued to breathe after the pulse had ceased.* The breathing was very peculiar in character, being of a sighing nature. Between each respiration an interval of about half-a-minute occurred, which gradually increased until the breathing ceased altogether. This form of respiration lasted for about eight minutes."

I performed a post-mortem examination on the day after his death, of which the following is the report:—

**External Appearances.**—A well nourished body, but extremely pale. The pupils are medium; the abdomen slightly distended; subcutaneous fat considerable, but somewhat soft and œdematous.

**Chest.**—The pericardium contains about 3 oz. of slightly blood-stained serum. The heart is very soft and flabby, and its external fat is much increased on the surface of the right ventricle. The aortic and pulmonary curtains are competent. There is slight atheroma a little above the free margins of the semilunar curtains, but the orifices of the coronary arteries are patent. The muscular tissue is very soft, but on the whole normal-looking. On cutting into the septum slight yellowishness of the fibres is observed. The lungs, trachea, and gullet are removed together. The left lung is pretty generally, and moderately firmly, adherent, the pleura in this situation being of cartilaginous hardness, and perhaps even slightly calcareous in parts. This very firm adhesion on the left side extends upwards as far as the fifth or sixth dorsal vertebrae, but does not extend round towards the front. After the thoracic viscera have been removed, a probe is passed into the gullet from above, and its further progress downwards is completely arrested at the level of the bifurcation of the trachea. On passing the probe from the gastric end of the gullet, it passes through the entire length of the tube without any difficulty. The trachea is then opened along its posterior wall almost to the bifurcation, but nothing

* The mode of death was observed and described by Dr. J. G. Gray, the Resident Assistant, who kept careful notes of the case.
abnormal is seen in it. The thoracic aorta is then laid open by cutting with the scissors from below upwards. Its internal coat presents tolerably healthy characters; but about an inch below the arch, and towards its posterior border, a circular opening with thin and somewhat ragged edges is found; this opening leads into a ragged cavity. The gullet is next laid open, and at the level of the obstruction just mentioned a large ragged ulcerated cavity containing débris of blood clot and broken-down tissue is found in its wall. The upper margin of this excavation is raised and rather sharp, and presents the typical characters of the margin of a malignant ulcer. The cavity had evidently eaten its way into the aorta, and produced the aperture in that vessel described above. It should also be noted that the wall of the aorta, in the neighbourhood of the aperture, which is about the size of a threepenny-piece, is somewhat thinned.

The liver is very pale, the margins of the lobules being specially so, as in the case of fatty infiltration. The kidneys present healthy characters. The spleen is large and soft in consistence. The stomach is greatly distended, being filled with red blood clot, which had formed a complete mould of the interior of the viscus. The duodenum and several feet of the upper part of the small intestine are similarly distended with red blood clot.

It will readily be admitted that the peculiarly serious complication, which took place in this case, renders it well worthy of record, apart altogether from the question of its interest as an example of cancer of the posterior mediastinum. It must be a circumstance of the rarest occurrence for the thoracic aorta to be eaten through in the manner that happened in this case. The case also, as well as that previously recorded, shows the tendency that cancer has to ulcerate and break down, rather than to increase into a bulky fleshy tumour, as happens with the sarcomata. This is a circumstance connected with the comparative pathology of cancer and sarcoma within the chest, which has a very important bearing upon the differential diagnosis of mediastinal tumours.

Case 10. Epithelioma of the Oesophagus causing Ulceration and Stricture—Slight Involvement of Lymphatic Glands—Death from Exhaustion.—Henry W., aged 50, a labourer, was admitted to the Glasgow Royal Infirmary on the 20th March, 1890, under the care of Dr. A. Wood Smith, who has
supplied me with the following outline of the clinical history:—
On admission he complained of difficulty of swallowing. His
previous medical history, with the exception of an attack of
pneumonia twenty years ago, and of rheumatism ten years
ago, had been good until within the last three years. Since
then, he had been troubled with bronchitis and slight asth-
matic attacks. The family history was unimportant, and he
had never suffered from venereal disease.

The difficulty of swallowing commenced suddenly five
weeks before admission, while eating his dinner, when a piece
of meat suddenly stuck in his throat as the result of some
obstruction encountered in the act of swallowing. After a
severe struggle he managed to swallow it, and since that time
there has always been some difficulty in swallowing solid
food, but none with liquids. He referred the obstruction to a
point corresponding to about the union of the middle and
lower thirds of the sternum, and complained of pain at that
point even when he was not swallowing. Physical examina-
tion of the chest was mainly negative, except that there
seemed to be a limited area of dull percussion in the inter-
scapular region, to the right of the vertebral column. He
had a harsh cough; the pupils were normal; the eye-balls
were somewhat prominent; and the radial pulses were equal.
The bowels were costive, and there was no vomiting. The
urine was normal throughout.

On the 12th April, 1890, a number of small bougies were
passed, and a considerable obstruction was encountered about
the level of the bifurcation of the trachea. Aneurism and
spasm were excluded as causes of the obstruction; and a
diagnosis of tumour of the oesophagus was arrived at. The
difficulty of swallowing gradually became greater, and the
patient died quietly on the 23rd June, 1890.

I made a post-mortem examination on the 25th June, 1890,
and wrote the following report:—

External Appearances.—The body was emaciated, but not
markedly so, and externally presented nothing abnormal.

Chest.—The pericardium contained several drachms of clear
serous fluid. The heart weighed 10½ ounces, and was some-
what flabby, the external fat being somewhat increased in
amount. Otherwise the organ presented nothing abnormal.
With the exception of a few old pleural adhesions and some
emphysema, the lungs presented healthy characters. There
was a remarkable absence of adipose and connective tissue
around the vessels and other structures at the root of the
neck, so that they stood out as if dissected. On passing the
fingers down along the line of the aorta and oesophagus a hard nodule, about the size of a hazel-nut, was felt in the latter, about half an inch below the level of the bifurcation of the trachea. An oesophageal bougie passed from the pharynx was completely arrested at the level of the nodule, but on passing it from the gastric extremity not the slightest obstruction was encountered. A second attempt to pass the bougie from the pharynx was equally unsuccessful. On laying open the gullet at the level of the nodule, and at a distance exactly six inches below the tip of the epiglottis, a triangular-shaped ulcer was discovered in the anterior wall of the gullet, the base of the triangle being inferior, the apex pointing directly upwards. The edges of the ulcer were slightly elevated and undermined, and they had a pale white colour. The floor of the ulcer had a worm-eaten appearance. The gullet could be freely dissected from the neighbouring parts, except at the site of the ulcer where it was adherent to the posterior surface of the left bronchus; but there was no sign of the bronchial wall having been involved in the malignant growth. From the shape of the ulcer, which was that of a cone pointing upwards, it is probable that the narrowest part of the structure was at its upper extremity, and in this circumstance we have a probable explanation of the impossibility of passing the bougie from above downwards, when there was no difficulty in passing it from below upwards. On microscopic examination of a scraping from the surface of the ulcer, numerous large flat nucleated epithelial cells were discovered, showing the epithelionatous nature of the disease. A scraping from the interior of a lymphatic gland in the neighbourhood of the ulcer also showed large nucleated epithelial cells lying amongst the lymphoid corpuscles, although there was no naked eye appearance of glandular enlargement.

The other organs of the body presented healthy appearances.

(To be continued.)

A CASE OF TETANUS IN WHICH THE INFECTION WAS TRACED TO A CHRONIC ULCER.

By R. M. BUCHANAN, M.B., C.M.,
Assistant to the Pathologist, Western Infirmary; Extra-Physician to the Royal Hospital for Sick Children, Glasgow.

The case is of interest in respect of a very unusual channel of infection—viz., a chronic ulcer—and also from the fact that
circumstances gave it the aspect of acute traumatic tetanus. The symptoms began to appear within twelve hours after the patient had received a wound in one of the fingers of the left hand; nevertheless it was found by bacteriological investigation that the disease was related, not to this source, but to a chronic ulcer in the leg.

I am indebted to Dr. Thomas Forrest, House-Surgeon, for notes of the clinical history, of which the following is a résumé:—

J. M'K., aged 43, a plasterer, was admitted to the Western Infirmary shortly before midnight on the 5th of July, suffering from tetanus, which proved fatal three hours later.

About the middle of June (three weeks previous to admission) he fell from a scaffold, sustaining rather severe bruising and possibly "fracture of one or two ribs." Recovery appeared complete, and work was resumed on the 29th of June. In the forenoon of the 2nd of July he sustained a slight wound of the left middle finger—a small flap of epidermis being raised and exposing a still smaller surface of cutis vera—and in the evening complained of slight soreness of the throat and back. On the 3rd there was some stiffness as well as soreness of the back, also stiffness of the lower jaw; on the 4th, inability to swallow from fear of choking. On the 5th, after sleeping for a time under the influence of morphia, he suddenly awoke with a cry about 2 A.M., complaining of pain in the back and having slight general spasms. The latter recurred at long intervals for a time. As the day advanced, however, spasms became more and more frequent, and also more severe, so that on admission to the Infirmary, near midnight, they were occurring about every two minutes, with arching of the back and flexing of the thighs. On the 6th, at 2:30 A.M., death took place from asphyxia during a spasm.

It remains to be noted that there was on the outer side of the calf of the left leg an ulcer which had existed for 17 years, associated with a varicose condition of the veins. So far as could be ascertained, it had not received any injury recently; indeed, it was said to have been in a better condition of late.

A post-mortem examination was made thirty-two hours after death, and the report is as follows:—The body is of a powerful build and well nourished. On the postero-lateral aspect of the calf of the left leg there is an oblong oval ulcer measuring one in. long, three-eighths in. broad, and one-eighth in. deep. Its edges are abrupt and clean cut, its floor covered by a thin
Infection was Traced to a Chronic Ulcer.

compact layer of greyish purulent matter. The skin over the greater part of the leg between the knee and the ankle is indurated and blueish. A small granulating wound, about one-eighth in. in diameter and covered by a flap of epidermis, is present over the distal joint of the left middle finger. On exposing the spinal cord—the only part examined—the dura mater appears greatly distended with fluid in the lumbar and lower dorsal regions. Beyond some congestion of the vessels on its surface, the cord itself is of a normal appearance.

Microscopic examination of pus from the ulcer revealed the presence of micrococci and bacilli, but none of the latter bore the characters of the bacillus of tetanus. Sections of the ulcer also have been stained by various methods, with the view of discovering the bacillus in the layer of pus or the tissues, but without any definite result as yet.

Notwithstanding the negative results of microscopic examination, success attended experimental cultures made from the pus in the floor of the ulcer. Two tubes of ordinary gelatine were inoculated from this source, and one from the wound in the finger. These were placed in an incubator kept at a temperature of about 37° C., and were afterwards examined as opportunity offered.

After two days the finger tube, which was sealed, showed growth in the form of a fine white deposit, and this proved, when examined microscopically three days later, to be a pure culture of a streptococcus.

The leg tubes also showed luxuriant growth after forty-eight hours. No. 1, an ordinary test tube two-thirds filled, presented an increasingly clouded appearance from above downwards. (The tetanus microbe being anaerobic, grows only in the deeper part of such a tube.) Minute bubbles of gas were constantly rising from the depths of the gelatine, and collecting on the surface to form a thin layer of peculiar white froth. This evolution of gas continued till the fourth day, by which time the growth appeared simply as a woolly-looking deposit, leaving the gelatine comparatively clear. On removing the india-rubber cap from the tube at this time the musty disgusting odour given off by cultures of the bacillus of tetanus was distinctly appreciable. Under the microscope the culture was found to consist of several species of bacteria, amongst which was one in large number, having the morphological characters of the bacillus of tetanus—namely, a delicate rod bearing at one end a large oval spore. (The evolution of so much gas may be attributed in large part to the microbe...
of malignant cœdema, which was also present abundantly.) No. 2, a sealed tube (laid in a horizontal position) showed a growth in the form of a white deposit along the side of the tube, the gelatine above being clear. There was no evidence of the production of gas till the tube was opened on the fifth day, when a very brisk evolution at once commenced from the vicinity of the deposit, and continued for a short time. Under the microscope there were also several species of bacteria seen, but the bacillus of tetanus was only represented by a few spores, while that of malignant cœdema was abundant. (A comparatively pure culture of the latter was obtained from this tube.)

In the microscopic examination of these cultures cover-glass preparations were made and allowed to dry in the air. They stained well with the ordinary watery solutions of methylene-blue, fuchsin, and gentian-violet, but rather better results were obtained by solutions containing a mordant, as aniline-water-gentian-violet and carbol-methylene-blue. An exceedingly good contrast between the spore and the rod was obtained by staining the former for several hours with carbol-fuchsin, decolourising in acidulated alcohol, and staining the latter for about a minute with a weak watery solution of methylene-blue. By this method the spores were brought into great prominence, and appeared as bright red oval bodies, sometimes pointed at either end.

It may be objected that the culture in which the so-called tetanus bacillus abounded was not subjected to the crucial test of inoculation. Inoculation of a few mice would, no doubt, have served to complete the experiment, but it did not appear to be called for, since the morphological and biological characteristics exhibited by the organism cultivated served to identify it beyond doubt.

The question, "How did the virus gain entrance to, and develop in, the ulcer?" remains to be answered. I will not presume to answer this question, but would offer the following as a probable explanation:—1. That at the time of the scaffold accident, particles of dust or earth got into the ulcer, carrying with them the specific organism. 2. That these particles becoming, in course of time, covered with pus, the conditions for anœrobiosis were thus brought about, and the organism naturally began to develop. It may be mentioned, as apparently supporting this explanation, that sections of the ulcer showed a large number of dust-like particles in the layer of pus.
CURRENT TOPICS.

SCOTTISH UNIVERSITIES COMMISSION—DRAFT ORDINANCES.

—Academical and extra-mural circles are at present busy in the study and criticism of the Draft Ordinances, which have been recently issued by the Scottish Universities Commission, and our readers are likely to be specially interested in at least two of these entitled respectively:—[General, No. 8.—Regulations as to Examinations] and [Glasgow, No. 1.—Regulations for Degrees in Medicine]. The most important change effected by the first of these is the formation of a Joint Board of Examiners to conduct the Preliminary Examinations in Arts, Science, and Medicine at each of the Universities. The Joint Board is to consist of four Professors or Lecturers and eight additional Examiners, the members of the Board (three from each University holding office for one year) representing the different subjects of examination according to a scheme of rotation which has been arranged. The Preliminary Examinations are to be held twice a year—in spring and autumn—and the Joint Board, with the Principal of the University as chairman, and the Secretary of the University Court as convener, shall sit at each University in rotation in the following order:—Edinburgh, Glasgow, Aberdeen, and St. Andrews. The enactment as regards the standard of the Medical Preliminary Examination is as follows:—“The standard for the Preliminary Examination in Medicine shall correspond as nearly as may be to that of the Higher Grade Leaving Certificates of the Scotch Education Department in French and German, and to that of the Second Grade Leaving Certificates in Latin, Greek, and English; provided also that the standard of Mathematics in the Preliminary Examination in Medicine shall be the same as that of the Elementary Mathematics in the Preliminary Examination in Arts.” In these regulations we have a step in the right direction, and they will have the effect of producing uniformity as to the Preliminary Examination in Medicine. The examination papers are to be sent down by the Joint Board to the different Universities with such instructions as to the system of marking, which may be necessary to secure an adequate and uniform standard in each of the Universities.

With regard to graduation in Medicine, the following important enactment has been made:—“The Examiners for
graduation in Medicine in each University shall be the Professors in the Faculty of Medicine in that University, together with such Lecturers in the University and such additional Examiners to be appointed by the University Court as the University Court shall deem necessary; provided that the Court shall make such provisions as will ensure that every candidate shall be examined in each subject by at least two Examiners, one of whom shall not be a Professor or Lecturer in the University. The examinations shall be conducted under regulations framed by the Faculty of Medicine subject to the approval of the Senatus."

In the regulations for degrees in Medicine several important changes have been made. It is proposed that the University of Glasgow should now confer four medical degrees instead of three as formerly—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The C.M. degree has thus been abolished, and the first two of the four degrees must be taken together. The degree of Ch.M. is intended to be a University distinction in Surgery corresponding to that which has hitherto been conferred by the degree of M.D. in Medicine. So far the proposal is highly satisfactory, but we cannot help thinking that it will be long before the Public come to regard the somewhat cumbersome title of Ch.M. in the same way as they have looked upon the time-honoured distinction of M.D.

The period of medical study has been fixed in the ordinance at five years—a regulation which has been rendered necessary by the recent decision of the General Medical Council. During the first four years of the curriculum the student is to attend upon the different courses of instruction which are essential to a degree, and in the fifth or final year he shall be engaged in clinical study for at least nine months. In each of the four years he must attend two courses of instruction extending over a session of five or six months, or alternatively, one such course with two courses extending over a session of three months. Two of the five years of study must be spent in the University of Glasgow; and eight of the sixteen specified courses of study (Section VII, Sub-section 3) must be taken in the University of Glasgow, or in some other University entitled to confer the degree of M.D., or in a College affiliated with such a University recognised for the purpose by the University Court. The remainder of such departments of study may be taken in Medical Schools or under teachers recognised by the University Court. Non-matriculated students must pay a fee equal to the matriculation fee, which entitles
them to the use of the University Library, and their class fees must be the same as those of the University. Considerable powers are given to the Senatus as to the regulation of the number of meetings, which shall constitute a course of instruction, and as to the division of the course into lectures, practical demonstrations, examinations, and tutorial work.

The courses of instruction necessary for a degree in medicine, as stated in the Ordinance, are as follows:

1. Anatomy,
2. Practical Anatomy,
3. Chemistry,
4. Materia Medica (including Pharmacognosy, Pharmacoogy, and Therapeutics),
5. Physiology or Institutes of Medicine,
6. Practice of Medicine,
7. Surgery,
8. Midwifery, and the Diseases peculiar to Women and Infants. Two Courses of Midwifery, of Three Months each, provided different departments of Obstetric Medicine be taught in each of the Courses, shall be reckoned equivalent to a Six Months' Course,
9. General Pathology,
10. Practical Chemistry,
11. Physics (including the Dynamics of Solids, Fluids, and Gases, and the Rudiments of Heat, Light, and Electricity),
12. Botany,
13. Zoology,
14. Practical Physiology,
15. Practical Pathology,

With regard to Clinical Medicine and Surgery the student must attend courses extending over not less than nine months. 'These courses may be conducted by Professors of the University, or by Lecturers appointed for the purpose by the University Court, or by the Ordinary Physicians [or Surgeons] of a General Hospital defined and recognised as hereinbefore provided, and shall consist of regular instruction at the bedside, along with at least two Clinical Lectures a week during six of the nine months.'

A course of instruction in Mental Diseases has now been rendered necessary, as well as attendance during fifty hours instruction in Practical Materia Medica and Pharmacy in the University or a recognised Medical School (Section VII, Sub-section 8); or in lieu of this, two years compounding and dispensing with a practitioner or qualified chemist and druggist. Sub-section 9 provides for six months' Dispensary Practice, for Clinical Clerking and Dressing, and for such
instruction, as may be determined, in Fevers, Diseases of Children, and Ophthalmology. The student must also put in three months' attendance at a Lying-in Hospital, and attend personally twelve cases of labour under the superintendence of a registered medical practitioner connected with such an Institution; and he must obtain a certificate of proficiency in Vaccination.

With regard to the enactments regulating the professional examination for the degrees of Bachelor of Medicine and Bachelor of Surgery, we think it right to quote in full the following sections of the Ordinance:—

"X. Each candidate shall be examined, both in writing and viva voce, in the following divisions—viz., First, in Botany, Zoology, Physics, and Chemistry (including Practical Chemistry); Second, in Pharmacognosy and Pharmacy; Third, in Anatomy and Physiology; Fourth, in Materia Medica, including Pharmacology and Therapeutics, Pathology, and Medical Jurisprudence and Public Health; Fifth, in Surgery, Practice of Medicine, Midwifery, and Clinical Medicine, and Clinical Surgery; and the examinations shall, as far as each subject admits, be conducted practically.

"XI. Candidates who profess themselves ready to submit to an examination in the subjects comprised in the first division—viz., Botany, Zoology, Physics, and Chemistry (including Practical Chemistry), may be admitted to examination in all or any two of these subjects at any examination held after they have attended a full course in each of the subjects professed: Provided always that candidates who have passed in one or more of the subjects of Botany, Zoology, Physics, and Chemistry (including Practical Chemistry), in the examinations of the University for Degrees in Science or in Arts, shall be exempt from re-examination in such subject or subjects for Degrees in Medicine and Surgery.

"XII. Candidates who have passed their examination in the first division may be admitted to examination in Pharmacognosy and Pharmacy after having complied with the regulations contained in Section VII, Sub-section 8 hereof.

"XIII. Candidates who have passed their examinations in the subjects comprised in the first and second divisions may be admitted to examination in the third division at the end of the third winter session.

"XIV. Candidates who have passed their examinations in the subjects comprised in the first, second, and third divisions may be admitted to examinations in the fourth division at the end of the fourth winter session, and to examination in the
fifth or final division when they have completed the fifth year of study."

The regulations for obtaining the Degree of M.D., or the new Degree of Ch.M., remain much the same as before, with this alteration—that, in addition to the presentation of a thesis, the candidate is required to pass an examination in Clinical Medicine (or Surgery, as the case may be), at any period of examination subsequent to one year after he has received the Degrees of M.B. and Ch.B. It is also enacted that the candidate may proceed to the higher degrees, after having obtained the lower, if he has been engaged in hospital or laboratory work, or in the military or naval services for one year; if, however, he has simply been engaged in practice, two years must be so employed.

The fee for the degrees of M.B. and Ch.B. shall be twenty-two guineas. The fee for M.D. shall be five guineas, exclusive of any stamp duty which may be exigible. The fee for Ch.M. shall be five guineas.

We have thus endeavoured to give a rough general sketch of the main provisions of the Draft Ordinances in so far as they affect medical education and examination. On the whole we think that the new regulations are a distinct improvement upon the old régime, in so far as they admit the necessity now felt for practical instruction rather than for mere lecturing, and also inasmuch as they recognise the desire, now very generally expressed, for a much wider and more equable distribution of teaching power as regards what are commonly called the practical (clinical) subjects. It seems to us that the tendency of reform in medical teaching has largely lain in the two directions which we have just indicated. The use of the phrase, "Courses of Instruction," in the Ordinances admits the necessity of the first of the two desiderata; and we are of opinion that the terms of Section VII, Sub-sections 5 and 6, referring to Clinical Surgery and Clinical Medicine, recognise, in some measure at least, the desirability of the second. These courses may be conducted by Professors of the University or Lecturers appointed for the purpose by the University Court, or by the ordinary surgeons or physicians of a general hospital. The principle is here recognised, that for efficient clinical teaching a large number of teachers and a large amount of clinical material are necessary. In our view, the larger the number of Clinical Lecturers the University Court appoints, the more efficient will the clinical instruction of the students be; and we hope that the Court will see its way to exercise the powers conferred upon it in a liberal and generous spirit.
Why should not all the Clinical Lecturers, recognised by the University Court in Glasgow, be "Lecturers appointed for the purpose?"

We observe, also, with approbation, that the science of Pathology as a subject in the curriculum has received more adequate recognition than has recently been the case in our University scheme, and that there is now every probability of the teaching of this important subject in Glasgow being placed on a level with that which rules in the other Scottish Universities.

We are of opinion, however, that a little too much is being made of the subject of Materia Medica. In addition to the statement in the list of curriculum courses, it has been found necessary to introduce a special Sub-section (VII, 8) of great length on the subject. If a principal part of a medical man's work were the compounding, and buying and selling of drugs (which we hold it is not), then we could understand the elaboration and detail, which have been expended over this matter. By all means teach Therapeutics as much and as long as possible; but in presence of the fact that the work of a medical man is not that of a chemist and druggist, we think that the lengthy requirements in this subject of study might with great advantage and profit be very considerably curtailed.

We have difficulty, also, in understanding why fifty hours' instruction in a class of Practical Materia Medica and Pharmacy in the University of Glasgow should be regarded as equivalent to two years' apprenticeship with a member of the Pharmaceutical Society of Great Britain. We certainly think that this Sub-section should be altered.

We think that the Ordinances might also be improved by the introduction of certain definite regulations as to the kind and quality of the evidence to be produced by the candidate of his having attended in the out-patient room of, and acted as a clinical clerk and dresser in the medical and surgical wards of, the hospital. A mere ticket of attendance may mean anything or nothing; and manifestly a student who has gone through the curriculum in clinical classes numbering over a hundred members, taught in wards capable of accommodating forty or fifty patients, can have had comparatively little clerking or dressing. This is also a matter which might with advantage be considered by the Commissioners.

The Chair of Medicine in Aberdeen.—Among the candidates for the vacant chair of the Practice of Medicine in the University of Aberdeen is Dr. George S. Middleton
of this city. Dr. Middleton is a graduate in Arts, with honours, of the University of Aberdeen, and he holds his medical degrees from Glasgow, all of which he obtained with the highest honours. As a practical physician he occupies a very high place, and, as a medical teacher in Glasgow during the last eleven years, he has shown conspicuous ability and success. We cordially wish Dr. Middleton success in his candidature, and we feel sure that, if appointed, he will shed new lustre upon the fame of the Medical School of Aberdeen.

THE TRISMUS OR TETANUS NEONATORUM OF ST. KILDA.—
The recent visit of the natives of this lonely isle to our city has again aroused the periodic interest which all sections of our community feel in the customs and trials of the islanders. During the past year the natives of St. Kilda have had the benefit of the services of one of the nurses (Nurse Chrisnhall) of the Glasgow Sick Poor and Private Nursing Association. She arrived in the island in August of last year, and as showing how completely cut off the island is from all ordinary communication with the mainland, we may mention that a letter, posted to her from Glasgow about a month after she left, reached her in June 1891—i. e., in about eight or nine months after being despatched. During the year that has elapsed since her arrival in St. Kilda, four births have taken place in the island, and three of the children died within a week of the peculiar form of lockjaw, endemic in the island. The natives calculate that only about one out of every four or five children born survives, the vast majority succumbing to this terrible malady. Nurse Chrisnhall informed us of one mother who had borne ten children, all of whom succumbed, within a week of birth, from this disease. The trismus generally sets in when the infant is about five or six days old, and coincides in its commencement with the separation of the umbilical cord. At birth the children look plump and healthy, and, so far as can be seen, no abnormality is present at the umbilicus either before or after the separation of the cord. The illness begins with a low whining cry, and usually lasts from about 20 to 27 hours in all. During this time the child is seized by a series of opisthotonic convulsions, in which the fists are clenched, the jaws tightly closed, and the spine curved; the fits recur every quarter of an hour, until death from exhaustion takes place. There is a common belief among the islanders that those children who are able to vomit during the paroxysms of the disease very often recover;
hence the first anxious inquiry on the part of a native visitor to a sick infant is, “Has it vomited”? So much is Nurse Chrisnall impressed with the importance of this belief on the part of the islanders, that she has been consulting various medical men as to whether it might not be a right thing to try the effect of ipecacuanha wine during the paroxysms. The natives, as a rule, are not robust; the men obtain a precarious living by capturing sea birds, and the women are engaged in weaving a coarse kind of netted cloth; their houses are small and dirty, the vitiated atmosphere being rendered more intolerable still by the fulner oil which they burn in their lamps. We understand that there are about 18 families, numbering about 80 or 90 souls. Is it not time that the Government took steps for establishing this small community on the mainland, and leaving the island to the sea birds?

**Glasgow Police (Amendment) Act, 1890.** — We have received copies of the Bye-laws which have recently been made by the Glasgow Police Commissioners, acting under the Glasgow Police Acts, 1866 to 1890, and which have received the approval of Lord Lothian, Her Majesty’s Secretary for Scotland. The first of these sets of Bye-laws regulates “the cleansing of common stairs, sinks, lobbies, passages, and water-closets, by the tenants in rotation.” Any of our readers who have had experience of the closes of the densely populated districts of our great city, will freely admit the urgent necessity for the stringent enforcement of the bye-laws now issued; and, in our opinion, if the rules are carefully carried out by the tenants, a very distinct improvement in the sanitary condition of these localities would soon be apparent. A few years ago we visited some of the tenements in the High Street along with Dr. J. B. Russell, and the state of matters we observed with regard to the common stairs, sinks, and water-closets in these properties was sometimes appalling. What we then saw has made us fully alive to the necessity of such a rule as the following:—“No night soil, ashes, vegetables, or refuse of any kind shall be emptied or discharged into any sink, nor in any stair, close, passage, cellar, or recess, within any building.” We sincerely hope that the general medical profession and the citizens will heartily co-operate with the sanitary officers in giving effect to these regulations. We are not aware whether any bye-laws have been issued to regulate the duties of the landlords in respect of such common stairs and passages, but it seems to us that the landlord should be bound by law to white-wash all such places at
least once or twice every year. A little attention of this kind on the part of the owners of the more squalid properties of the city would go a long way in encouraging the tenants to obey the law as it affects them.

The second set of Bye-laws is for the regulation of cemeteries, and contains enactments as to the proper fencing and draining of burial grounds, the registration of graves, the depth of the graves, and the proper covering in of the coffins. Such rules are also of the very highest sanitary importance, although they do not possess the same general interest as the former.

The Albert Metropolitan University.—The Lords of the Privy Council have given judgment *in re* the petition in favour of creating a new teaching university in London, with power to confer degrees, under the name of the Albert, or the Albert Metropolitan University. The judgment, which was delivered by Lord Selborne, was practically a finding for the petitioners. The full details of the deliverance will be found in the metropolitan weekly medical press. We are, of course, quite unable to discuss the merits of the position at present taken up by the Royal Colleges and the Medical Schools in London; but, in view of the finding of the Privy Council, these bodies seem to be placed in a dilemma. To us, in Scotland, it would seem unreasonable that the Royal Colleges should obtain the entire control of the Medical Faculty of the New University, and we are of opinion that the proposal of the Privy Council to grant the Colleges six and the Medical Schools five seats on the Council of the New University is eminently fair. In the event of the Royal Colleges declining the six seats offered to them, it is proposed to give ten seats to the Medical Schools, but if the *British Medical Journal* of 18th July last is to be believed, the Schools have decided to throw in their lot with the Colleges, who, as was stated by Sir Arthur Wilson, Q.C., would decline to accept the position offered to them. This is a position which we cannot understand, and which, therefore, we will not attempt to discuss.

A point of greater interest to us is the effect which the New University is likely to have upon medical teaching in Scotland. Large numbers of English students receive their medical training and degrees in Scotland, and there can be little doubt that, if a good teaching university, at which degrees could be obtained on the same footing as those granted by the Scottish Universities, were established in London, a serious diminution in the numbers of men who seek their professional education North of the Tweed would
inevitably result. If the citizens of London are able to effect this, no one, and certainly no one in Scotland, can find any fault with them, and that this was the feeling of the Privy Council was demonstrated by their declaration that the Edinburgh University and the Scottish Medical Corporations had no _locus standi_ in the matter in the present stage of the proceedings. It is not easy to estimate the effect that the new foundation is likely to have upon the numbers of students seeking the qualifications of the Scottish Corporation, but, if a regulation to the effect that a "qualification entitling to registration under the Medical Acts must be obtained before a degree in medicine can be conferred on a candidate by the New University is to stand in the charter," the numbers seeking Scottish degrees and qualifications are not likely to be seriously affected, at least for some time to come. We are very far from believing, however, that it is the qualification alone which attracts English students to Scotland. The moderate cost at which a medical training can be obtained, and the excellence of the teaching, especially in the more purely scientific portions of the curriculum, are elements which cannot be neglected in judging of the success and attractiveness of our Schools; personally, we have no objection to the foundation of a teaching university in London, which, by stimulating a healthy competition and rivalry, would, we think, contribute still further to the success of medical teaching in the North.

**British Institute of Preventive Medicine.**—Dr. John Lindsay Steven, who attended the deputation to the President of the Board of Trade, has received the following letter from the Honorary Secretary of the Institute:

> "19 Iddesleigh Mansions,
> Westminster, S.W., 22nd July, 1891.
>
> "Dear Sir,—I have great pleasure in informing you that in consequence of the deputation which waited upon Sir Michael Hicks-Beach on 5th June, the Board of Trade have registered the British Institute of Preventive Medicine as a Limited Liability Company with the omission of the word 'Limited.'
>
> "I am instructed by our Chairman to express to you the best thanks of the Executive Committee for the share you took in bringing about this satisfactory result, by your support on the occasion of the deputation.—I remain, yours faithfully,
>
> "M. Armand Ruffer, Hon. Sec.
>
> "J. L. Steven, Esq., M.D."
Obituary.

The Emperor of Germany in England.—"The State Banquet at Windsor was admirably served, and the menu had wisely been reduced to reasonable proportions. The Emperor appeared most to enjoy the Bisque d’Ecrevisses aux Quenelles, the haunch of venison, the roast beef, and the Charlotte Russe aux Fraises. His Majesty drank Rhine Wine at dinner and Apollinaris Water, and afterwards he took a bumper of the Queen’s famous Madeira, finishing up with a glass of Tokay, like his grandfather, the Prince Consort, who always concluded his dinner with Tokay, of which her Majesty possesses a unique cellar."—(The World, 15th July, 1891).

Obituary.

Fordyce Barker, M.D., LL.D.

We have received from New York the following biographical sketch of the late Dr. Fordyce Barker, who was one of the honoured guests of the British Medical Association in Glasgow in 1888, and whose personal character endeared him to many friends here and elsewhere, while the University of Glasgow selected him among the numerous foreign guests for the honorary distinction of LL.D.:—

Fordyce Barker, M.D., LL.D., was born at Wilton, Maine, 2nd May, 1818. His father, John Barker, M.D., was much respected, and his mother charmed by her beauty and graces. He graduated at Bowdoin College, Brunswick, Maine, in 1837, in a class that gave other noted men to the services and reputation of their country. He graduated at the Bowdoin Medical School in 1841, after following the hospitals in Boston, Professor Henry J. Bowditch being his preceptor. Having a tendency to pulmonary affections, he advised him to use much care in the selection of his future home. Finding that Norwich, Connecticut, met this requisition, he located there in the summer of 1841. His talent was soon recognised; and, from being the youngest, he rivalled the oldest physicians in the place. He married on 14th September, 1843, at Harrisburg, Pennsylvania, Miss Elizabeth Lee Dwight of Springfield, Massachusetts, and continued his practice at Norwich.

Dr. Bowditch had expressed a wish that he should go to Paris and study for a French degree. In 1844 the way opened
for its accomplishment. Accordingly, on 1st October, 1844, he set sail with his young wife, from the port of New York, in the good ship *St. Nicholas*, of 900 tons burden, commanded by Captain Fall, and bound for Havre, France. His first quarters in Paris were the Hôtel de Hollande, Rue de la Paix. During the winter of 1844-45 he followed the hospitals from the early morning hours, and attended lectures, passing most of his evenings in study, in preparation for the next day. These studies were only interrupted by a severe attack of varioloid early in the season. A married medical student was an amusing and surprising personage to his confrères. He passed June and July in travel, intending to remain in Paris until October; but the severe illness of a loved relative obliged his return in August. His diploma was afterwards sent to him. Among his friends of this date—friendships ending only with their lives—were Baron Dubois, Chomel, Trouseau, Sir Joseph Oliffe, and others.

Returning to Norwich, he resumed practice there in September, 1845, with brilliant success, and was soon known throughout the State. He was elected Professor of Midwifery in Bowdoin Medical School, and lectured there in the spring of 1846 at 27 years of age. But he filled the chair only one year, finding the interruption to his practice disadvantageous.

In May, 1848, he made the annual address as President before the Connecticut Medical Society, which was much noticed.

In 1848 or 1849 he was visited by Professor Chandler F. Gilman, of the College of Physicians and Surgeons, who, with Professor Willard Parker, wished his removal to New York.

Subsequent events led to his locating in that city in March, 1850, where his remaining life-work was accomplished. He was one of the incorporators of the New York Medical College. Later, he served thirty-five years on the Medical Board of Bellevue Hospital, and the Hon. William M. Evarts is the only survivor of the Board of Governors who appointed him. This, and his membership in the Faculty of Bellevue Hospital Medical College, ended only with his life.

His professional record has been known and read of all men, and a list of some of his writings is appended.

He was also the recipient of many honours. In 1878 he was elected President of the New York Academy of Medicine, and held the position until 1884—three terms. On 20th June, 1878, Dr. Fordyce Barker received the honorary degree of LL.D. from Columbia College, New York, at its commencement, by President Barnard for the trustees. On 17th April,
1884, the honorary degree of LL.D. was again conferred upon him by the University of Edinburgh, at its tercentenary celebration, by the Principal. In June, 1887, he received the same honour from his Alma Mater, Bowdoin, College of Brunswick, Maine, where the honorary degree of LL.D. was conferred, at the fiftieth anniversary of the Class of 1837, by President Hyde. On Friday, 10th August, 1888, the degree of LL.D., honoris causa, was conferred upon him by the University of Glasgow, in the Bute Hall, at the meeting of the British Medical Association in that city, he being capped by the Very Rev. Principal Caird, Vice-Chancellor of the University. A fifth Honorary Doctorate was offered by the University of Bologna, Italy, at its octocentenary celebration, but he could not attend.

His judicial mind and general culture made him much sought after in cases of legal difficulty; and, during the celebrated Beecher trial, several lawyers' conferences were held in his library at 85 Madison Avenue. It is unnecessary to add that his views were in Mr. Beecher's favour. When the horror of the murder of President Garfield on 18th June, 1881, was absorbing the attention of the country, he was asked to testify in the Guiteau case. This he positively refused to do. Subsequently, on receipt of a personal request from the President of the United States, he consented to give testimony as an expert; but never visited Guiteau. It was said that his calmly-delivered opinion had much influence with the jury, and upon the charge of the attorney-general. He was often retained by leading lawyers.

His medical friends in the Old World were many. Among them may be named Professor Sir James Y. Simpson and his nephew, the present Professor Simpson, of Edinburgh; Professor Gairdner, of the University of Glasgow; Sir Charles Locock, Sir Henry Thompson, Sir Spencer Wells, Sir James Paget, Sir William Gull, Drs. Priestley, Ord, Barnes, and Matthews Duncan, of London; Drs. Ball, Apostoli, and Herbert, of Paris; Professor Virchow, of Berlin; Dr. Tamburini, of Milan, Italy; Dr. Grant Bey, of Cairo, Egypt, and many others.

In 1881 he was a Vice-President of the International Medical Congress at its London meeting.

He was also a scholar in general literature, and his society was much sought. Above all, he carried his Christianity into his daily life. Its painless close, at the end of his long, useful, and honourable career, was one of the blessings awarded him from above, because of his frequent and
tender ministries to others in their hours of suffering. It closed here (24 East Thirty-eighth Street, New York City) on 30th May, 1891. His wife and only son survive him.

The following is a list of some of Dr. Fordyce Barker's writings:


REVIEW.


Among the numerous treatises which have recently appeared on public health, that by Mr. Wynter Blyth, the medical officer of health for St. Marylebone, and the editor of Public Health, the recognised organ of the Society of Medical Officers of Health for England, must occupy a prominent place.

Mr. Blyth, in the preface, says that "he has interwoven knowledge, compiled from various sources, with his personal official experience in both urban and rural districts. In the plan of the work and in its treatment, he may, perhaps, claim some originality; at all events, it is intended to convey the
author's idea of the subjects of special knowledge necessary for those engaged in either an administrative or subordinate capacity in the Public Health Service to be acquainted with."

The various subjects are discussed under twelve sections, as follows:—Statistics; Air, Ventilation, Warming; Meteorology; Water Supply; Drains, Sewers, Sewage Disposal; Nuisances; Disinfection, Disinfectants; Zymotic (micro-parasitic) Diseases; Isolation Hospitals; Food, Diet; The Duties of Sanitary Officers; Inspection of Food.

The sections on vital statistics; air, including ventilation and warming, are very full, and information on these subjects, is brought up to the latest date.

Regarding mechanical, as compared with natural ventilation, our author says:—"Mechanical ventilation is the only kind of ventilation which can be relied on for large public buildings, such as churches, schools, assembly rooms, theatres, and the like. In schools badly ventilated on the natural system, the micro-organisms increase, up to a certain point, with increase of wall and floor space, whereas in mechanically ventilated schools, where the air is quickly renewed, the micro-organisms decrease with increase of cubic space. The cost per head to naturally ventilate a school, built to accommodate 1,000 children, as well as to heat, may be put at 2½d. per head. The mechanical system will cost 7½d., the difference being thus £19, 15s. per annum. The figures refer to Dundee, hence the cost will be greater in towns where coal is dearer, and less where coal is cheaper than in Dundee. But, in any case, £20 or £25 per year per 1,000 children extra should be considered well spent if it conduces to greater purity of air. Carnelly investigated several systems both of heating and ventilating schools, and recommends a fan or fans driven by a gas engine; also, that the fresh air should be blown in, not sucked out; that incoming fresh air should be filtered through coarse jute cloth placed diagonally across the large inlet flue, or across the air chamber; that there should be but one main inlet air shaft, freely open at the top, and not fitted with Louvre boards; and, lastly, that the fresh air inlet shafts, in the various rooms ventilated on the mechanical principle, should be much wider and shallower than is usually the case, so as to distribute the air in a thin stream." Probably the best mode of securing a reasonable purity of atmosphere in schools would be to increase the floor space, though it were at the expense of height of ceiling; to insist on greater attention to cleanliness of person and clothing among the scholars, and to dismiss the children for a short period after one hour's No. 2. L Vol. XXXVI.
attendance at classes, so as to admit of the class-room being thoroughly ventilated by opening the windows and doors.

The various methods for the estimation of carbonic acid in the air are described, and our author says:—"The simplest process of all, and one which might be used without the smallest knowledge of chemistry, is the phenol-phthalein method. Phenol-phthalein gives to alkaline solutions an intense crimson colour; but is very sensitive to CO₂, and this property can be taken advantage of to make approximate determinations of carbonic acid in the air." The quantitative estimation of carbonic acid in the air could be made by any person of ordinary intelligence in a minute or two without the slightest difficulty. This mode of examination would be of great value to sanitary inspectors who have to do with the inspection of ticketed houses and common lodging-houses.

Section IV is devoted to the consideration of Water Supply, Sources of Water Supply, the Water Supply of the Metropolis, the Scientific Examination of Water.

This section, which ought to deal with the water supply of the entire community, is the most imperfect and incomplete of all; so much so, indeed, that sharp criticism is unavoidable. Regarding the sources of water supply, our author says:—"In a few cases a water supply is obtained by distilling sea water—such as, for instance, in the small towns in some parts of Peru, where rain never falls, and where there are no other sources of supply; but, leaving this quite exceptional instance, the sources of supply, for the main part, fall under the three following heads:—(1) Rivers; (2) Lakes; and (3) Wells." This subject is discussed and disposed of within the narrow limit of two pages, and no reference whatever is made to the utilisation of rain water. Our author, from his official experience, in rural districts especially, must be aware of the fact that a supply of pure water from rivers, wells, or lakes, is impossible; and that the water supply, as a general rule, is either contaminated, or liable to contamination of the most dangerous description. The annals of cholera and of enteric fever clearly establish this fact; and it may be safely asserted that were reasonable attention paid to the utilisation of rain water in localities where a pure gravitation water supply is impossible or impracticable, cholera could never become epidemic, and enteric fever would soon be stamped out.

It is also well known that, in periods of long drought, a water famine frequently prevails in rural districts, more especially in mining localities; and in illustration of this, we may mention that, no later than the month of May last, the
Chairman of the County Council of Lanarkshire is reported to have stated that he did not know whether, on his return to Mauldslie Castle that evening, there would be enough water to make his tea. The roofs of Mauldslie Castle, connected with a storage tank, adapted with filtering apparatus, would have secured for him an ample supply of the purest water, all the year round, and at less cost than were he supplied with gravitation water from Loch Katrine. The same may be said regarding every row of small houses, every cottage, every farm, every villa, every mansion, with slated roofs, in our rural districts where the atmosphere is pure, yet our author totally ignores the fact.

On the general principles of a town water supply, it is stated that "the usual material for service pipes is lead. It is, therefore, of much importance in initiating a water supply to first ascertain whether the water will act on lead." Are we to infer from this that water which will act on lead should not be used as a public water supply? Hard water, so-called, is not suitable for a public water supply, and all soft water acts, in a greater or less degree, on lead; but the dangers from this action may be easily reduced to a minimum. Were we in Glasgow to act upon the suggestions made, we would require to abandon our Loch Katrine water supply, and look out for a source which never has been, and never will be, discovered. Is lead an absolute necessity for service pipes? and, if it be so, is it absolutely impossible so to manipulate lead by some internal coating as to render it a safe conduit for water?

It may be stated, generally, that the articles on water supply, drains, sewers, and sewage disposal, the most important subjects with which the medical officer of health has to do, are very incomplete. One chapter is devoted to the water supply of the Metropolis, and another to the sewerage of the Metropolis; but we fail to perceive the use of these detailed accounts in a Manual of Public Health unless it be to condemn emphatically both systems.

The chapters treating of nuisances, offensive trades, and disinfection are very complete, and he gives verbatim the bye-laws of the London County Council regarding each of them; but, even in these chapters, our author is guilty of numerous sins of omission. He gives a condensed and valuable summary of trade nuisances as investigated by Dr. Ballard of the Local Government Board; but we can find nothing more than a passing reference to the black smoke nuisance, and the means which might be adopted for its mitigation or prevention, though we
have sought for it carefully. In the index we are referred to p. 247 for information regarding "Smoke as a nuisance;" but all the information afforded is contained in the following lines: —"In all these cases [of black smoke] it will be absolutely necessary, if legal action be contemplated, to enforce an order of the sanitary authority, to prove by expert evidence that the fireplace or furnace is not of the best construction, or that known appliances have not been made use of to consume the smoke or to prevent its emanation." Smoke is the insanitary curse of city life, of small town life, and, in many cases, of rural life in districts where public works are situated. Smoke renders the atmosphere impure directly and indirectly; and it also interferes with the ventilation of dwelling houses, as windows cannot be opened without the certainty of the furniture being covered with soot. Mr. Blyth could, with great advantage to his readers, have left out his chapters on the metropolitan water supply and sewage disposal, and devoted the space to the utilisation of rain as a water supply, and to the mitigation or prevention of the smoke nuisance.

In Section VIII, our author discusses with great fulness the zymotic (micro-parasitic) diseases, and special prominence is given to tuberculosis. Referring to the diseased meat prosecution in Glasgow, he says:—"The question cannot be said to be entirely at rest, but the evidence certainly goes so far as to show that this drastic course (the condemnation of the entire carcass) is the safest, and that such meat does in fact generally contain a few of the bacilli or their spores; and that, when eaten in a half-cooked state by young children who inherit some weakness of tissue resistance, or are at the time in a state of imperfect health, may and does produce a certain amount of tubercular infection."

Notwithstanding the defects noted, Dr. Wynter Blyth's *Manual of Public Health* is a very valuable contribution to sanitary science, and should have a place in the library of all medical officers of health and county sanitary inspectors.

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The second edition of *The Workhouse and its Medical Officer* has been entirely rewritten, the object of our author being to be of some service to those of his professional brethren who
may be appointed medical officers of workhouses or poorhouses, and to assist them in performing their numerous and very arduous duties with something approaching to efficiency. The subjects treated are:—Appointment and Tenure of Office, Salary, Provision of Medicines, &c., by Guardians, Duties, Attendance at the Workhouse, Attendance on the Sick, Resident House-Surgeon, The Receiving Wards, Probationary Wards, Nursing, Dietaries, The Examination and Certifying of Lunatics, Detention of Lunatics in Workhouses, Quarterly Returns of Lunatics in Workhouses, Vaccination, Operations, Post-mortem Examinations, Detention of Venereal Cases, Management of the Lying-in Ward, Itch Cases, Medical Relief Book, Prescription and Diet Card, The Register, Weekly Report Book, Medical Officer’s House Book, Annual Report, Pharmacopœia, Relations of Master and Medical Officer, Divided Authority in Workhouses.

Every page of the short treatise before us impresses one with the fact that it has been written by one thoroughly conversant with his subject, and deeply interested in it. While it is specially adapted for the use of medical officers of English workhouses, it will also be of service to medical officers of Scotch poorhouses, although the English workhouse and the Scotch poorhouse differ in many important respects. The abuses of the English system are very forcibly depicted, and remedies suggested. He contends for a gradual rise of salary in proportion to the increase of inmates, and for compulsory superannuation, on resignation, according to period of service. He says:—“Some years ago, the medical officer of the Barnsley Workhouse applied for an increase to his salary, which was refused by the guardians, the application being considered ‘inopportune.’ There were 150 sick; the medical officer had to attend daily, and his salary was £70. The barber of the same workhouse was paid £32 a year for attending twice a week to shave and hair-cut the inmates.” He very emphatically condemns the practice, which prevails in some places, of the medical officer providing the medicine required; and, in illustration, states that, during the first year of his practice, he had a district, and that, exclusive of extras, his salary was £40, and his drug bill £39.

Regarding nursing, he says;—“In all workhouses of any size there are a large number of sick, and these patients should always be tended by nurses who have had some training. Pauper nurses are altogether a snare and a delusion, and should never be employed except as helps to a responsible nurse. It is important that nurses, as far as
their work is concerned, should be entirely under the direction of the medical officer and the superintendent nurse."

The chapter on Diet and Dietaries contains many valuable suggestions; and, regarding economy, he says:—"If my experience is worth anything, I would say there is a shocking waste of food in workhouses. As a pauper can at any time claim to have his food weighed, the master, for his own protection, will see that he is supplied with the quantity due to him. The result of this is that, if a pauper does not eat his allowance, part of it is wasted. Take bread, for instance; the pauper gets his proper quantity, but if he cannot eat it, he will take care to pull it about so that it cannot be used for anyone else, and it goes to the pigs. There ought to be some way of remedying this."

In the concluding chapter on the Relations of Master and Medical Officer, our author speaks forcibly, and evidently from well-remembered experience:—"Blessed is the medical officer who has at his workhouse a master who is straightforward, truthful, and loyal, and who is content to do his duty without interfering with the duties of others. The average master’s view of the relative position and duties of medical officer and master is, as a rule, unsatisfactory. If there is a good master, things go on pleasantly enough; but, if otherwise, the medical officer is subject to frequent vexation and anxiety. There must be divided authority in workhouses. Whilst the master is the official who is responsible for the general management and good order of the house, it should ever be borne in mind that the medical officer is the supreme responsible officer in all matters connected with the sick. The truest loyalty should exist between master and medical officer, and then miserable squabbles and questions of divided authority will have no existence; and a rightly understood imperium in imperio will be the recognised correct state of matters in a workhouse."

In conclusion, we heartily commend this short treatise to all those interested in the subject—medical officers, masters, guardians, and managers—the subject treated of being of importance, and of great public interest.


At the Otological Section of the Annual Meeting of the British Medical Association, held in Birmingham last year,
Dr. Jones read a paper on the Etiology of Tinnitus Aurium. The paper was so lengthy that its delivery was hurried, and from the mass of details it contained it was found impossible to discuss it. Later, it was published in full in the British Medical Journal, and it appears now as the first portion of the book under notice, the remainder being taken up with the consideration of the diagnosis and treatment of tinnitus and the probable prognosis in such cases. In this work we have an attempt at classifying cases of tinnitus aurium by a systematic differentiation of the causes. Such is a necessary preliminary to anything approaching scientific treatment. Whether our knowledge is advanced by this publication or not is questionable, as most of the facts here given are already known to aurists, and there is nothing of a particularly novel character amongst the forms of treatment recommended. It may act as an incentive to more careful enquiry into the cause of this condition, and thus be productive of good. It is clearly written, and as the author himself is a sufferer from tinnitus, his observations regarding causation are of special interest.


This work, first published fifteen years ago, is well known to surgeons, and especially to those dealing with injuries and diseases of the nose, as it was perhaps the first, and for many years, the only work devoted to this special branch of surgery.

During the years which have elapsed since the appearance of the first edition, intra-nasal surgery has made great strides, and the works dealing exclusively with this specialty are now numerous and ever on the increase. This second edition is brought well up to date, which, considering the revolution in the department of treatment, consequent on the introduction of cocaine, necessitated the re-writing of a great part of the book. Special sections on Post-nasal Catarrh, on Hyper-trophic Rhinitis, on Adenoid Vegetation in the Naso-pharynx, and on the Relation between Nasal and Aural Diseases have been added, thus adding to the completeness of the volume, besides representing the present state of our knowledge in this department.

It is replete with accurate information, and has numerous
well chosen illustrative cases from the practice of the author
and others, which give point to the conditions under con-
sideration.

A Manual of Diseases of the Nose and Throat, including the
Nose, Naso-pharynx, Pharynx, and Larynx. By P. S.
Hutchinson, M.R.C.S., Assistant Surgeon to the Hospital

Handbooks published as introductory guides to the study of
particular departments in medicine and surgery are more
frequently written and issued with a view of introducing the
author (usually compiler) as a specialist to the notice of the
profession at large. This manual, the A B C of diseases of
the nose and throat, may supply a long felt want. But in
recent times, works on general surgery, thanks to the colla-
boration in authorship now largely taken advantage of in
medical works, contain all the information here given; and,
as it is contained in a work which all practitioners possess, it
is to be preferred in that form to a volume like the one under
consideration. This book was intended for those “who are
taking up the post-graduate study of this special branch of
medicine.” If it is necessary that the post-graduate carry the
volume in his pocket, this, from its size, is all that could be
desired, but it is to be hoped that no graduate will rest
satisfied with the information contained in this manual.

Notes on the Examination of the Sputum, Vomit, Fæces, and
Urine. By Sidney Coupland, M.D., F.R.C.P. London:
H. K. Lewis. 1891.

This is a very handy little manual for the use of senior
students and clinical clerks in the medical wards. The work
lays no claim to any originality, either in subject matter or
in the form in which it is presented, but all the same it will
prove very useful. To the junior student the book would be
apt to be confusing; but after he has got up his elements he
will find it very helpful in his work. The subject matter is
arranged in the form in which many medical tutors prepare
notes for use in class demonstrations; and in looking through
its pages we were very strongly reminded of the plan we
used to adopt in arranging our own demonstrations on the
subjects dealt with. Dr. Coupland has written a very useful
little book.
ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

NERVOUS DISEASES AND INSANITY.

By Dr. R. S. STEWART.

A Case of Hysteria Simulating the Symptom of Weber.
By Charcot (Archives de Neurologie, May, 1891).—This is the case of a young woman of 18, who presented herself at the Salpêtrière suffering from right hemiplegia and left ptosis, a combination of symptoms which would point to an organic lesion of the lower and inner part of the cerebral peduncle, and which has not hitherto been observed in hysteria. The onset of the hemiplegia, four years previous to the time of observation, was gradual and without appreciable cause, and it was succeeded one year afterward by exquisite hyperesthesia localised in the right side of the body, and especially in the neighbourhood of the joints. At the end of a few days these arthralgias improved, and gave place to hemianesthesia and complete right hemiplegia, which confined the patient to bed for ten months. The paralysis gradually and spontaneously disappeared in the course of a year. The ptosis had developed gradually without any known cause two years previous to the onset of the paralysis, and had persisted without any notable modification. Notwithstanding the apparent gravity of the co-existence of ocular symptoms of one side, with motor troubles of the opposite limbs, M. Charcot expresses his conviction that the condition is one of hysteria, and predicts a complete cure.

The dropping of the lid of the affected eye is held to be due not to paralysis, but to spasm, even though some of the usual symptoms of this latter condition were absent, such as vibration of the lid and resistance on attempts being made to open it, pronounced wrinkling from contracture and spontaneous tremors increased by voluntary attempts to open the eye. The signs present in this case indicative of spasm were a relative lowering of the eyebrow of the affected side, not disappearing on wrinkling the brow, and accentuated during attempts to open the eye widely, more pronounced wrinkling of the brow on the healthy side, the presence above the dropped lid and towards its nasal end of two or three vertical corrugations, one of which very distinctly limits a small rounded depression. The result of these various contractions is to give to the physionomy a sad and disappointed air.

Use and Abuse of Hyoscine.—By Weatherley (Journal of Mental Science, July, 1891).—In a paper read at the last quarterly meeting of the Medico-Psychological Association, this writer expresses the strong conviction that this drug is most deserving of a permanent place among the recently introduced hypnotics. Its use, however, requires watchful care in cases of weak heart or general feeble circulation, and in these conditions he recommends its combination with aromatic spirit of ammonia. Mental excitement, especially motor, if not hysterical, is greatly controlled by it, but it often fails in the excitement of tabes. Its effect on temper and irritability is usually very marked. In small or moderate doses it induces a condition closely resembling sleep, but in larger doses (½ gr.) it often produces deep sleep. Its proper use, in the writer's opinion, is as a mental alternative in cases characterised by a quarrelsome, resentful, abusive, arrogant, and domineering disposition. In hysterical cases with hallucinations, it is very unsuitable, but in delirium tremens, disseminated sclerosis, and chronic alcoholism, its use has been attended with success. Given
Abstracts from Current Medical Literature.

hypodermically, it will act surely and rapidly in subduing delirious and maniacal excitement; but its indiscriminate use as a powerful and sudden hypnotic is, the writer thinks, an abuse.

In the discussion which followed, Percy Smith remarked that hyoscine in his experience, unlike hyoscynamine, was unattended with serious effects. Savage described the case of a female patient who was extremely maniacal, and in whom a single dose of \( \frac{1}{16} \) gr. induced a sleep from which she never roused. He recommends it in cases of **factic circulaire** and recurrent mania. In Law Wade's experience, its effect is purely temporary, and he deprecates entirely the hypodermic use of the drug.

**Some Unusual Cases of General Paralysis.** By Fox (Journal of Mental Science, July, 1891).—Four cases of this disease presenting peculiarities are here described. The first was characterised by well-marked remission and disappearance of nearly all the typical features of the disease; the second, by the rapid appearance of pathognomonic paralytic symptoms, both physical and mental, directly after an injury to the head; the third, by the superintervention of the disease upon tabes dorsalis, which had existed for some time previously; and the fourth, by the occurrence of melancholic delusions and the rapid development of bedsores.

As regards treatment, the writer remarks that in active mania opiates fail, and prolonged warm baths, free purgation and digitalis in large doses are to be recommended. He has utterly failed to find anything like a specific, and he is doubtful that benefit is to be obtained from physostigma. Tonics—such as iron, arsenic, and quinine—are beneficial, and for epileptiform seizures there is no remedy equal to the combination of chloral and bromide. In cases in which there has been preceding syphilis, the use of mercury and iodide has been unattended with benefit.

The concluding remarks are, that the occurrence of considerable periods of remission, and the prolongation of the disease, albeit exceptional, to 20 or 30 years, should indicate the possibility of cure in early cases of general paralysis; that paralytic symptoms may follow immediately on a blow, suggesting cause and effect; that the most desperate physical condition need not necessarily prove fatal; that tabes dorsalis predisposes to general paralysis; that it may be impossible to recognise in the early stage the melancholic type of the disease; that this variety is characterised by a tendency to gangrene, and runs a rapid course; and that it is uncertain what conditions predispose to or determine its occurrence.

**Post-Eclamptic Mania.** By Alexander (Journal of Mental Science, July, 1891).—A primipara, aged 17, during the last three months of pregnancy had complained of headaches, pains in the loins, vomiting, and oedema of hands, feet, and face. Convulsions set in after the confinement, and she was admitted to the Edinburgh Maternity Hospital three and a half hours afterwards in a comatose state. The urine was found to be albuminous and to contain casts and blood. Bleeding, active purgation, vapour bath, cupping over the kidneys, chloral by the rectum, chloroform during the fits, and pilocarpine were ordered, and she had in all eight fits after admission. Deep coma succeeded the eclampsia, and this was in turn replaced by furious mania, which disappeared on the succeeding day. Recovery followed after a short period of drowsiness and stupidity. Causes predisposing to the maniacal outburst were to be found in the childish and emotional disposition of the patient and the existence of distinct neurotic heredity.

**Accumulation of Cocoa-nut Fibre in the Stomach: Death from Intestinal Obstruction.** By R. S. Stewart, M.D., D.P.H.Camb. (Journal of Mental Science, July, 1891).—I. A. H., aged 12, was admitted into the Glamorgan County Asylum on 6th November, 1888. When 7 months old he had convulsions, and these recurred till he was two years of age, and then disappeared. At the age of 7 he had one other fit. He is said to have been
able to speak when two years old, but not since then. Ultimately he became so troublesome and defective in his habits as to be unmanageable at home, and he was removed to the asylum.

His mental condition was one of idiocy, with much restlessness. He was noisy and dirty, and was much given to picking up rubbish and pulling doormats to pieces.

Until the commencement of the fatal illness, which occurred on 4th September, 1889, his bodily condition was uniformly good, and there was no hint whatever of any disturbance of the digestive system. He took food well, and was not at any time troubled with sickness, vomiting, or constipation. On the last mentioned date he became listless and apathetic, lost his appetite, and began to be sick. Next day he vomited the little milk he took, and appeared to be in some pain, as he now and then put his hand over his abdomen as if suffering there. On that day there was one natural motion. There was no apparent enlargement of the abdomen, and little tenderness on manipulation, but a hard inelastic tumour could be detected in the epigastrium over the site of the stomach. One dose of 5 grs. of grey powder was administered, but was shortly after rejected, and an enema brought away only a small piece of feaces. The vomiting and complete inaction of the bowels continued, the temperature rose to 100° F., and death occurred on 11th September, seven days from the onset of the illness.

On post-mortem examination, made twenty-three hours after death, the brain was found to be much hypertrophied, its weight being 57 oz., or 11 oz. over the average; the heart was normal, and the lungs and solid organs of the abdomen presented nothing noteworthy beyond slight congestion. A small quantity of brownish serum was present in the pelvic portion of the peritoneal sac, but nowhere was there any fibrinous exudation. About the junction of the lower and middle third of the small intestine an obstructive mass could be felt, and the stomach was occupied by a firm unyielding mass. The peritoneal lining of the small gut above the seat of obstruction was inflamed. The stomach on removal weighed 25 1/4 oz., and, when emptied, 7 oz. Its contents, weighing 18 1/2 oz., consisted of three separate solid masses, each about the size and shape of the closed fist, and several smaller masses wedged in between the larger. These were composed almost entirely of cocoa-nut fibre, with a few strands of dried grass, soaked in a pea-soup like and only slightly stercoraceous fluid. On section of two of the pieces no lamination could be observed; the fibres assumed a dense felted arrangement. The gastric mucous membrane was only slightly congested; and in the neighbourhood of the pylorus, where the muscular coat was much hypertrophied, it was strikingly rugose. The obstruction in the ileum was found to be a mass of similar composition to those described. It assumed a banana-like shape, and the sharp ends of the loose fibres were projected downwards and outwards into the wall of the gut in a manner that seriously prevented its downward passage. The intestine above the obstruction contained slightly feculent fluid, but not in any great amount, and the mucous membrane presented a swollen and inflamed appearance. Below the obstruction the intestine was empty, with the exception of a small mass of feaces in the caput cecum coli. The Peyer's patches, below the obstruction as well as above it, presented distinct alteration from the normal. Above they were much congested, and below they had a swollen and roughened appearance.

The total weight of the fibre masses after drying was only 4 1/2 oz.

Collections of indigestible substances are occasionally found in the stomach of cattle, horses, and goats; and here, as a rule, they form round a nucleus, and present a greater or less degree of lamination. Youatt, in a book on the diseases of cattle, published in 1834, records instances in which the nucleus took the form of such varied articles as scissors, a handkerchief, an old shoe, the lash and part of the handle of a whip, a waistcoat, a buckskin glove, a shell, and pieces of straw, stone or iron (verily il ne faut point disputer des goûts). Sometimes, as in the case here recorded, there is no distinct central nucleus, and these masses are usually composed of hair irregularly matted.
together. Occasionally the concretion contains a large quantity of mineral matter, and forms a calculus capable of taking on a high polish, and sometimes these, forming as they do in the intestine of the horse, give rise to fatal obstruction.

Thoresz in his work on intestinal obstruction, classifies foreign bodies occurring in the stomach and intestines into (1) rounded or regularly shaped bodies capable of passing readily, (2) sharp pointed bodies, and (3) indigestible materials of small size which are apt to accumulate and form large masses, such as husks of oats, vegetable fibres, grape skins, hair, wool, and yarn, the latter swallowed by habit by dressmakers and others, or intentionally by lunatics and hysterical persons. The case here recorded would belong to the third class, and it further affords an illustration of a remark which he makes to the effect that these bodies may remain for years in the stomach or intestine without causing any mischief, but that when so lodged they may almost at any time induce changes leading to a fatal result. From inquiries made subsequently to the patient's death it appears that, even before his admission, he had been addicted to eating, among other things, cocoa-nut fibre, and that during the first twelve months of his residence in the asylum he had picked two doormats to pieces, but subsequently to that he entirely gave up the habit. There is every reason, therefore, to believe that the masses found in the stomach had been present for some considerable time, and that there was on the part of the stomach an entire toleration of their presence. The practically unaltered condition of the gastric mucous membrane found on post-mortem examination would point in the same direction, and the fatal result is to be attributed not to the presence of these masses in the stomach, but to the extrusion—an accident liable to occur at any moment—of the small mass into the intestine and consequent obstruction.

Many of the reported cases have occurred in lunatics and hysterical persons. In one case recorded by Dr. Quain, and cited in Treve's work, the obstrucive mass of cocoa-nut fibre weighed 4 lb. Another is described by Dr. M'Dowall (Journal of Mental Science, January, 1882), where the colon contained a mass composed of pieces of wood, wire, stocking, ticking, and leaves. Dr. Campbell records (Journal of Mental Science, July, 1896), an instance where the stomach contained a mass of matted hair, pieces of blanket, and a hank of twine, one end of which had become unwound and extended into the intestine for 2 feet, and in the case of an idiot patient of the Earlswood Asylum, described by Dr. Cobbold in the same journal (April, 1886), death resulted from persistent vomiting induced by the presence in the stomach of a collection of human hair, cocoa-nut fibre, horse hair, and leaves, weighing 24 lb. Habershon (Diseases of the Abdomen, third edition, p. 253), cites the case of a sailor who had repeatedly swallowed clasp knives. The stomach contained several knives and parts of others; one was found fixed transversely in the rectum, and one blade had perforated the colon. In Walsh's book, The Horse, an account is given of a young lady who died in consequence of the accumulation in her stomach of hair which she had swallowed. Since writing the above an instance has been related to me where several recently hatched chicks died in consequence of the accumulation in the gizzard of the fibres from moss litter which they had picked up from the floor of their coop.

PATHOLOGY AND BACTERIOLOGY.

By R. M. BUCHANAN, M.B., C.M.

The Origin of Pus Corpuscles and their role in Inflamed Tissues.—(Médecine Moderne, vol. ii, 7th May, 1891).—M. Ranvier read a paper on the above subject before the Académie des Sciences, in which he declared that diapedesis alone was not sufficient to account for the rapid production of the great quantity of pus corpuscles found, for example, in cases
of purulent infection. He found that, in twenty-four hours after irritation of the peritoneum with a solution of nitrate of silver (3 per 1,000), the clasmocytes had given place to lymphatic cells, and that at certain points the intermediary stages were seen—the clasmocytes reverting to their embryonic form, and becoming transformed into leucocytes which multiplied by simple fission. He held that the function of pus corpuscles was the elimination of cells destroyed by the irritation, so cleansing the wound and preparing a clean surface for the reparative processes.

This statement was founded on the results of injecting an irritant solution (nitrate of silver, $\frac{1}{4}$ per cent) into the peritoneal cavity of the rat. The rat, killed twenty-four hours after injection, contained in its peritoneal cavity a quantity of sero-purulent fluid, the pus cells of which contained various forms of cellular débris, fat, red cells, fatty granules, albuminates of silver, and fragments of cells. If the rat lived three days nothing was found in the peritoneal cavity.—A. N. M'G.

On the Physiology of Asphyxia. (George Johnson, M.D., F.R.S. (Lancet, 4th and 11th April, 1891).—In this paper the author adduces additional experimental evidence in support of the theory which he first published twenty-two years ago—namely, "that the arrest of the circulation in the final stage of asphyxia (apnoea) is caused by the contraction of the muscular-walled pulmonary arterioles." The following facts were elicited by the experiments, which were all performed on animals under the influence of anaesthetics. 1. When the chest of an animal is opened immediately after death caused by ligature on the trachea, the right cavities of the heart are found enormously distended, while the left are comparatively empty. 2. When the heart of an animal is exposed during the progress of asphyxia, the right cavities are seen to become distended; while the left cavities, which had been previously gorged, are found to be collapsed and comparatively empty. 3. In the last stage of asphyxia there is a continuous increase of pressure in the pulmonary artery, while the systemic arterial pressure is falling. 4. Under the influence of agents which are known to paralyse the arterioles—e.g., nitrite of amyl, atropine, and curare, the deprivation of air is unattended by distension of the right cavities of the heart, or other evidence of obstructed pulmonary circulation; the life of the animal is prolonged for several minutes, and death ultimately results from the toxic action of venous blood upon the cardiac and nervous tissues.

Uterine Angioma: an Undescribed Form of Uterine Polypus. By R. B. Wild, M.D., B.Sc. (Med. Chron., April, 1891).—Amongst a number of uterine polypi examined by Dr. Wild in the last few years, two were found having the characters typical of angioma of the cavernous type. The chief works on "Diseases of Women" contain no mention of this form of polypus as occurring in the uterus. Dr. Wild's contribution is valuable in this respect; but he is desirous of bringing this form of polypus more prominently forward because of the anatomical basis which it provides for what is the most salient and puzzling feature in the clinical history of many similar cases—namely, the enormous loss of blood in comparison with the size of the growth. The belief is expressed that, if the polypi removed from the uterus were more frequently examined microscopically, it would be found that many of those causing severe and prolonged haemorrhage are of the angiomatous type. In both cases recorded haemorrhage was the chief clinical feature, and in both the polypi were essentially of the same microscopic structure. They showed large thin-walled vessels, and still larger vascular spaces, also extravasations of blood in the scanty fibrous tissue forming the walls of the spaces, and masses of blood pigment from haemorrhages of older date. The superficial portion, consisting of more condensed fibrous tissue, presented no surface epithelium. In it, between the vessels, were one or two alveoli lined by columnar epithelium, evidently mucous glands; while isolated groups of similar cells were also present in
different parts of the section, being probably the remains of similar alveoli. Some of the more superficial vessels contained organising thrombi.

[Virchow has described a case of small angiomata of the uterus (Wilks and Moxon), and Coats mentions that mucous polypi may become angiomatos.] A Simplification and Shortening of Biedert's Method for Finding Tubercular Bacilli in the Sputum by means of Stenbeck's Centrifuge. Dr. König (Berlin Klin. Woch., 20th July, 1891), has applied the centrifuge to the examination of the sputum, with the result that a considerable number of tubercular bacilli were found in a case where the ordinary method had failed to reveal them. The sputum was diluted with a solution of caustic soda, and on the application of centrifugal force for five minutes, a somewhat compact sediment was separated, which gave the above result on examination. By Biedert's method the sputum so diluted has to stand for two to three days to allow of the precipitation of the bacilli. (Professor Litten has explained the application of Stenbeck's centrifuge to purposes of clinical medicine in the Deut. Med. Woch., No. 23.)

Polymastism, with Special Reference to Mammæ Erraticæ and the Development of Neoplasms from Supernumerary Mammary Structures.—By W. Roger Williams (Journal of Anatomy and Physiology, vol. xxv, January, 1891).—"This comprehensive paper will prove of considerable interest to students of comparative human, or morbid anatomy. The human breasts may be regarded as greatly enlarged and modified cutaneous sebaceous glands, developed from the columnar cells of the epidermis by a process of continuously progressive ingrowing gemmation with differentiation. Each mamma is the homologue of but a single sebaceous gland. The nipples do not develop until the glandular elements have been formed, and may even never arise, as is normally the case in the lowest mammalian animals, the monotremata."

"While human beings usually possess but a single pair of mammary glands, most mammals have several pairs, and in the insectivorous order there may be as many as eleven and seldom fewer than seven. There is a certain relation between their number and the number of young brought forth at a birth. The lowest mamalian, representing the primitive type, have mammae, which, as a rule, are exclusively inguinal; in the highest class they are almost always pectoral; those with abdominal mammae occupy an intermediate position. In man any diminution in number is very exceptional, but not uncommonly they are increased, and then appear in certain definite positions which almost invariably correspond with those occupied normally by the glands of polymastic animals. The writer attempts to show how such abnormalities may be explained by 'reversion.' He considers the ideal human polymastic ataurus had at least seven pairs of mammae on the ventral aspect of the trunk; the present pair only having survived. Of the lost pairs three were situated above and external to present normal pair, and three below and internal."

"Thus the mammae are considered as being originally segmental organs. Cases in confirmation of this view are cited. It is very rare for mammary structures to be found on any other part of the body. Of 166 cases only four examples of mammae erraticæ were found. Cases are quoted. The author believes 'there is no evidence whatever that such structures can arise just anywhere, as 'sports' from ordinary sebaceous follicles,' and attempts to show that so-called true mammae erraticæ are 'due to reversion to ancestral arrangements much more ancient than those reproduced in ordinary cases of polymastia.'"

"Supernumerary mammary structures appear to be more frequent in males than females. They rarely attain to the structural and functional completeness of normal glands. More than three-fourths of all cases of supernumerary mammae are situated just below and internal to the normal mammae. Abdominal mammae are very rare, but cases are quoted. Supernumerary mammae
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situated above the normal glands are also seldom met with, but when they do occur are always external to the normal ones.

"Mammary malformations occur in probably all races of men, and have been observed in animals. Supernumerary mammae are often hereditary. Being usually small and rudimentary they hardly attract the notice even of those who bear them, and their true character may be readily overlooked. Hairs, which never occur on normal nipples, may develop on supernumerary ones, and hence they may be taken for moles or nevi.

"The subject of supernumerary axillary mammae is discussed in a special section, and a number of cases quoted.

"Supernumerary mammary structures are of special interest to the pathologist, in being, in not a few instances, the seat of new growths. Of 50 cases of fibro-adenoma consecutively under observation, 7 (14 per cent) originated in supernumerary mammary structures, and of 132 cases of cancer of the mammary region in women, also consecutively observed, 13 (9.8 per cent) appeared to have commenced in the same way. Abstracts of these cases are given.

"The interest and value of the paper is in great part due to the extensive references to the literature of the subject and to the brief notes of numerous cases." —(T. N. Kelynack, Med. Chron., April, 1891.)

DISEASES OF THE EAR.

By Dr. WALKER DOWNIE.

Operation for the Relief of Deafness, Noises in the Head and Ears and Vertigo, due to Chronic Catarrh of the Drum of the Ear. By Samuel Sexton, M.D.—There are details given here of seven cases of sclerosis of the middle ear where, for the relief of the accompanying deafness, noises in the head and ears, and vertigo, he performed the operation of removal of the membrana tympani. The difficulties and the disappointments met with in the treatment of this condition, and the hopelessness of any attempts to arrest the progress of this particular sclerosis in the majority of cases are well known to aurists. The operation of removing the membrana tympani with one or more ossicles is performed with the object of permitting the sound-waves—the obstructing membrane being removed—to impinge directly on the round windows and on the base of the stapes. By doing so, hearing in many cases is improved. He does the operation under the influence of an anesthetic, dissects out the membrana tympani, carefully removing the malleus in all cases, along with the incus in some, and carefully avoiding the chorda tympani. The operation is followed by suppuration, and frequently by the formation of granulation tissue, which tends to close the opening thus made, and these granulations, in many cases, require to be removed time after time to ensure a sufficient space for entrance of sound-waves. Giddiness followed the operation in some cases, in others the noises were increased, until the patient became accustomed to the new condition of parts; usually these noises slowly subsided.

In the seven cases detailed, improvement followed the operation in all, the amount of improvement, however, varying.—(Archives of Otolagy, April, 1891.)

A Case of Foreign Body in the Tympanum. By Dr. S. Mandelstaunn, Kiev, Russia.—This is the report of a case where a portion of a cherry-stone remained fifteen months in the tympanum without causing any marked reaction in the deeper regions of the ear or in the meninges, and without exciting any reflex symptoms. There was continued and profuse suppuration from its presence with formation of granulation tissue, which was several times removed before the cause was brought into view. When removed the suppuration ceased, and the parts healed.—(Archives of Otolagy, April, 1891.)
Cases of Ear Disease Resulting in Death.—In the Centralblatt f. Chirurgie, No. 2, 1891, Schwarze makes a communication on twenty-eight cases of ear disease terminating in death. Two died of lepto-meningitis, ten of abscess of the brain, and sixteen of thrombosis of the sinuses. Of the ten cases of abscess in the brain the great majority (seven cases) were secondary to disease in the right ear, three resulted from disease in the left ear. In three cases the abscess was situated in the occipital lobe, in four cases in the cerebellum, and in one case there was abscess in both situations, and in two cases the pus was between the dura mater and the bone. In many of the cases the ear disease had extended to the mastoid process, and in several the roof of the tympanum was also in a state of necrosis. The fatal complications occurred for the most part when there was ear disease of old standing, although in three the aural trouble was of but recent date. He urges as precautionary measures early paracentesis of the membrane, and early trephining of the mastoid, with the hope of clearing out the products of inflammation thoroughly and quickly. The latter—trephining—he strongly recommends, especially when there is inflammation of the mastoid, recent or secondary, when symptoms persist; in long-standing inflammation of the mastoid, and in obstinate cases of otorrhoea, when treatment appears to be of little or no avail.

A Contribution to the Histology of Aural Polypi. By C. Klingeek of Heidelberg.—This paper is founded on the examination of fifteen aural polypi from different cases. They were the result, for the most part, of chronic middle ear suppuration, a few only appearing as a result of a primary inflammation of the external auditory meatus. The structure of the specimens consisted mainly of three kinds of tissues—viz., myxo-fibromatous, angio-fibromatous, and granulation tissue, and in most cases all these new growths existed side by side in the same tumour. The specimens are described individually, and interesting details regarding the epithelium, blood-vessels, growth and retrograde changes are added.—(Archives of Otology, April, 1891.)

Books, Pamphlets, &c., Received.

The Treatment of Typhoid Fever, especially by “Antiseptic” Remedies, by J. Burney Yeo, M.D. London: Cassell & Co. 1891.


THE PATHOLOGY OF MEDIASTINAL TUMOURS, WITH SPECIAL REFERENCE TO CLINICAL DIAGNOSIS.

By JOHN LINDSAY STEVEN, M.D.,
Assistant Physician and Pathologist, Glasgow Royal Infirmary.

(Continued from p. 127.)

Secondary cancer of the mediastinum is of quite minor importance, the chief interest naturally attaching to the primary tumour. It is, therefore, unnecessary to discuss in detail the pathology of this variety of mediastinal disease. As in the case of sarcoma, secondary cancers in the chest are perhaps more likely to develop in the interior of the lungs than in the mediastinal space. It may be noted, however, that the mediastinum may be secondarily invaded by cancerous disease in one of two ways—(1) by continuity; (2) by metastasis; and of these two modes the former is in all probability the more common. Thus, it is quite conceivable that in the later stages of a cancer of the breast, the pleural and mediastinal spaces might be invaded by processes of the tumour extending directly through the chest walls. This is a complication, however, which is largely prevented by the almost universal practice of removing the primary tumour in cases of cancer of the mamma. Pathologists also are well acquainted with the circumstance that cancerous disease of the peritoneum frequently extends into the cavity of the chest by way of the lymphatic channels of the diaphragm.
When the pleura is invaded by cancer in this method, the nodules are generally small and disseminated, and are not likely to attract any attention during life.

Metastasis, on the other hand, is more likely to cause secondary cancerous formation in the lungs than in the pleura or mediastinum, although secondary tumours originating in this manner are sometimes met with in the latter localities; and, no doubt, most surgeons will have had experience of cancerous pleurisy taking place at a longer or shorter interval after operations for the removal of mammary carcinoma.

**III. Fibroma of the Mediastinum** is an exceedingly rare disease, only seven cases having been discovered by Hare in his search through 520 cases of mediastinal disease.* I quite agree with Hare in his estimate of the extreme rarity of this form of primary mediastinal tumour—i.e., pure fibroma of the mediastinal space. It is to be remembered, however, that sometimes it must be very difficult to be perfectly certain whether one is dealing with a pure fibroma, or with a tumour possessing a somewhat mixed character, to which the terms fibro-cellular or fibro-sarcomatous might perhaps be more applicable. I have met with one case of mediastinal tumour, which I am inclined to classify as a fibroma, although in doing so I am quite aware of the difficulty that certain features in the case give rise to. In this instance, the tumour was associated with a very striking rheumatic diathesis, and it is not improbable that such an association may have an important etiological significance with reference to fibrous tissue tumours of the mediastinum. At this stage, then, it will be better to relate the case, after which its nature and etiological significance may be discussed.

The case occurred in the practice of my friend, Dr. Alex. Napier of Crosshill, who sent me the tumour for examination and report.

**Case 11. Fibroma or Fibro-cellular Tumour of the Mediastinum, with numerous Subcutaneous Nodules over the Front of the Chest, at the Root of the Neck, and in the Axillae, associated with Recurring Attacks of Acute Rheumatic Fever and Valvular Disease of the Heart.** The following is the clinical and post-mortem account by Dr. Alex. Napier:—

"The patient was seen by me only once during his life, and

*Loc. cit., p. 111.
† The specimens in this case were shown at the Glasgow Pathological and Clinical Society, on Monday, 11th November, 1889; see Glasgow Royal Infirmary Museum, Series X, 234 C."
that in a casual way. The following are the clinical notes I was able to obtain:—G. J., aged 29, formerly a gardener, latterly a church officer, had throughout his whole life been subject to genuine and acute rheumatic attacks, involving the joints, and ultimately also becoming complicated with valvular disease of the heart. His recurring attacks of rheumatism seem to have been his only ailment till the month of July, 1888, when it was noticed that the lymphatic glands in both armpits were enlarging; they were at first freely movable, but ultimately became fixed, and grew so large that the armholes of his clothes had to be cut to give him room. Towards the end of the same year (1888) numerous little lumps, apparently enlarged glands, appeared over the front of the chest, while larger swellings developed at the root of the neck, over the clavicles; his attention was first drawn to this by finding that his collars were becoming too small for him. At the same time marked enlargement of the veins at the root of the neck and over the upper part of the chest was noticeable. These glandular swellings, as a rule, were not painful.

"In the spring of the present year (1889) he had another severe attack of rheumatism, complicated this time with pleurisy, affecting apparently both sides. From this time onwards he went steadily downhill. He rapidly lost flesh, became pale and anaemic, and short of breath, the slightest exertion sufficing to bring him into difficulties, his face becoming a ghastly whitish-grey in colour, and his lips bluish. His most striking symptom was his cough; this was extremely paroxysmal, the attacks lasting sometimes for nearly an hour, resembling very severe hooping-cough, and leaving him utterly exhausted. These attacks often came on when eating, and usually ended in vomiting. The glandular swellings steadily increased in size. At the time of my visit, in January, 1889, very many enlarged glands were to be seen in front of the chest, probably somewhere between 30 and 50, some of them as large as walnuts. Over the inner ends of both clavicles, and extending up into the neck, were similar masses; and in both armpits were masses as large as one’s closed fist. At this time there was no trace of pleurisy or other lung affection. Of late the patient, in sitting, leaned very much over to the left side, and he slept in this position. The patient was persuaded to enter the Western Infirmary, but took fright, and ran away after only two days’ residence, and before any detailed note was taken of his case. He died suddenly when at stool, on 2nd September of this year, fourteen months from the time he first noticed the glands in the armpits enlarging.
"Post-mortem Examination thirty-six hours after Death. —Rigor mortis well marked. Body much emaciated, but front of chest apparently unduly prominent considering the general emaciation. Skin everywhere dull-yellowish in colour. Edema of scrotum, and penis, and left side of face; enormous edema of left arm, fore-arm, and hand. On making the skin incision in the middle line, there was found over the whole sternum and costal cartilages a thick, hard, cartilaginous plate of glandular tissue, adhering very closely to the bone, but not to the superjacent skin. In the middle line this mass was cut with some difficulty; it was about 1½ inch thick, and gradually thinned off towards the sides of the chest. Enormous glandular masses, of the same hard, almost cartilaginous consistence, were found in both axille, close under the anterior folds, and running under the pectoral muscles. Similar dense masses were seen over both clavicles, running up along the cervical vessels. No enlarged glands in the groin, or in any part of lower half of body. The sternum was raised with difficulty on account of its close attachment to the growth underneath, to which, just as to the growth on its outer surface, it was very closely adherent. A large dense mass was found filling the anterior and posterior mediastinum, and enveloping the heart, which was lodged in a cavity on the left side of the growth. The left pleural cavity was quite full of clear straw-coloured fluid, while the entire left lung was collapsed and compressed against the spine and against the tumour. The right lung was universally adherent, but still crepitant. Liver and kidneys normal. Spleen not enlarged, but apparently firmer in texture than normal. There was not a trace of enlargement of the mesenteric glands, a fact which was very striking when contrasted with the enormous enlargement of the glands within and without the upper half of the body. The mass was removed from the chest, and included trachea, large vessels, heart, left lung, and part of right lung. A portion of spleen was also removed."

Dr. Alex. Napier sent the mediastinal mass to me for detailed examination and dissection, and I shall now describe the results of my dissection.

The specimen consists of the tumour, the anterior wall of the pericardium, the heart, the arch of the aorta, the bifurcation of the trachea, about 6 inches of the gullet, the whole of the left lung, and a very thin portion of the right lung, adherent to the tumour. The growth lies in front of all these structures, is firmly adherent to the anterior
pericardial wall, and is of a dense, tough, white, fibrous-looking structure. It is somewhat quadrato in shape, measuring in vertical diameter, after hardening in spirit, about 8½ inches, and in breadth 5 inches; the average antero-posterior thickness is about 2½ inches. At the upper right hand corner, and at the lower left hand corner, are two nodulated projections from the main mass of the tumour. The upper of these, on section, is seen to be pigmented, and of a softer, more encephaloid character than the rest of the tumour tissue—conditions which rather suggest the possibility of the mass having originated in one of the bronchial lymphatic glands. Below the level of the bifurcation of the trachea the main bulk of the tumour is firmly adherent to the pericardium, but it is found that this membrane can, when considerable force is used, be stripped in its entirety from the posterior wall of the growth, showing that the tumour tissue has not incorporated the pericardial tissue. The gullet is quite behind the mass of the tumour, and is not involved in it. The trachea, however, all except its posterior wall, is encased by tumour, and the arch of the aorta channels its way right through the upper portion of the growth, being surrounded by it on all sides. The superior vena cava, and other great veins at the root of the neck, are also completely surrounded by the tissue of the growth. A dissection of the specimen has been made which displays these relationships, and it is found that all the structures at the root of the neck, though very closely applied to the tumour, can be dissected away from it—i.e., they have not been incorporated, but merely surrounded and closely embraced by the tumour. There is no trace of pericarditis, the interior of the membrane being quite smooth and shining. On slitting up the superior vena cava, what looks like an ingrowth of the tumour into its lumen is discovered. This is situated on that portion of the vessel which tunnels through the growth; the projection is a flat area with irregular rounded margins, measuring about a square inch, and elevated about one-eighth or one-twelfth of an inch above the surrounding surface. The greater part of the wall of the vena cava, even at the site of the apparent ingrowth, can, with care, be dissected from the morbid tissue. The heart, so far as can be satisfactorily made out without separating it from its relationships to the tumour, presents some thickening and contraction of the mitral curtains. The left lung is collapsed.

On microscopic examination the tumour presents appearances which, having regard to histological structure alone,
may be designated those of fibroma or fibro-sarcoma—i.e., a pretty abundant fibrous basis with very numerous round and spindle-shaped cells, these being in far greater abundance than would be the case in a hard fibroma pure and simple. The characters are not those of a lympho-sarcoma or lymphoma, and the macroscopic characters noted above are in favour of this statement as to the structure of the tumour. Numerous sections of thin-walled blood-vessels are observed in the microscopic specimens. I thought that the term "fibro-cellular" (not using the words in the strict and limited sense of Paget in speaking of the fibro-cellular tumour) indicated very well the nature of the microscopic characters.

A careful microscopic examination of sections of the wall of the vena cava superior, at the site of the apparent ingrowth, shows no trace of tumour tissue in the substance of the vein wall, and the appearances are rather those of a thickened internal coat. This examination, taken along with the fact that the vein, even at the site of the projection, could be dissected from the tumour in its entirety, negatived the idea of an ingrowth of tumour tissue. The remarkable features about the tumour were mainly these, most of which had been brought out in the course of the report:—(1) The peculiar way in which the growth had embraced without incorporating any of the normal structures and organs; (2) the exceedingly tough, dense, and fibrous structure of the tumour, almost resembling in section the appearances presented by a myoma of the uterus; (3) the strict limitation of the new growth to the anterior mediastinum and region behind the sternum, and its association, according to the post-mortem report of Dr. Napier, with a similar mass of dense fibrous-like tissue in front of the sternum, and in the neck.

It will readily be admitted that there are many obscure points in the pathology of this case; but, on a consideration of the whole phenomena, it seems justifiable to regard it as an example of a fibrous tissue tumour of the mediastinum. As was to be expected from the clinical history and the pathological details, the question of Hodgkin's disease was at once raised and discussed when the specimens were presented by Dr. Napier and myself for the consideration of the Members of the Glasgow Pathological and Clinical Society. There seems, however, to be but little reason for considering it as an example of this affection, and that it was not a typical example of Hodgkin's disease was admitted even by those most inclined to favour this opinion as to its nature. The
absence of any affection of the spleen, the fact that there was no enlargement of the glands in the groin, in the abdomen, or in any part of the lower half of the body, and the circumstance that the numerous nodules scattered over the front of the chest were not likely to be glandular from their anatomical situation, are circumstances not at all in keeping with the theory of Hodgkin's disease.

In the next place, the question of connective tissue hyperplasia has to be considered in connection with the pathology of this case. The term "malignant fibrosis" indicates very well the general nature of the case as brought out in the foregoing description, and from this point of view many of the phenomena are analogous to certain of the morbid changes observed in cases of scleroderma and allied conditions of the connective tissues. We are thus led to consider the etiological significance of the strongly marked rheumatic diathesis, which existed in this case. It is now very well known that the development of subcutaneous nodules, especially in connection with the tendons, is a common manifestation of the rheumatic state, and for one of the best clinical accounts of this condition we are indebted to Dr. W. B. Cheadle of the Great Ormond Street Hospital for Children.* Such nodules occur much more frequently in children than in adults. Dr. Cheadle has only seen two cases in adults, and a third has been recently reported by Dr. George S. Middleton of Glasgow.† The characters of the nodules are well described in the following sentences from Dr. Cheadle's Harveian lectures:—"Once I have seen them the size of almonds studded over the flexor tendons on the palms of the hands, and once in great numbers over the tendinous structures of the intercostals, on the front and sides of the thorax. There may be only one of these nodules, but more usually three or four are to be found; sometimes the number is large, as many as thirty or forty. I have counted thirty-five at one time. . . . Their duration varies from a few days to several months. The shortest time I have noted is fourteen days, but Dr. Barlow observed one to come and disappear again in three days. . . . When the nodular growths are exposed by dissection they appear as 'oval semi-transparent fibrous bodies, like boiled sago-grains.' Examined microscopically in thin section, they exhibit wavy bands of tissue, with caudate and spindle-shaped cells and abundant nuclear growth, and they are highly vascular. They consist,

* The Various Manifestations of the Rheumatic State as Exemplified in Childhood and Early Life (London, 1889), p. 68 et seq.
† The International Medical Journal, 1887.
therefore, of nuclear growth in process of development into fibrous tissue in all stages of transformation." This description of the histology of the nodules agrees very closely with that of the tumour which is at present under consideration.

In another part of his book Dr. Cheadle goes on to show that such fibrous nodules are frequently associated either with pericardial or endocardial inflammation, and that such a combination is, in his opinion, generally of the very gravest import—"almost equivalent to a sentence of death."

Drs. Thomas Barlow and Francis Warner made rheumatic subcutaneous nodules the subject of an important paper read before the Seventh International Medical Congress in London in 1881, and their paper is well worthy the careful study of all interested in this matter.* In reference to the case of mediastinal tumour at present under discussion, the following sentence from the description of one of Dr. Cheadle's cases of rheumatic pericarditis associated with subcutaneous nodules is worthy of being quoted:—"And mark what is found after death: usually the two surfaces of the pericardium glued together by a thick layer of adhesive lymph; the pericardium itself greatly thickened; the walls of the sac tough, dense, fibrous tissue, an eighth of an inch thick, perhaps; the chronic inflammatory process spreading sometimes from the external sac to the anterior mediastinum, so that these are matted together in a thick fibrous mass—'indurative mediastino-pericarditis,' as seen in the specimen from one of these cases now before you."†

I have referred to these rheumatic manifestations at some length, because I think they are of importance in the endeavour to trace out the etiology of the rather obscure case of mediastinal tumour, which has just been related. On the whole, I am inclined to regard it as a fibrous tissue tumour of rheumatic origin. Notwithstanding the fact, as pointed out in the report, that some portions of the growth looked as if it might have originated in connection with the thoracic lymphatic glands, I am still inclined to think that the starting point of the tumour, both within and without the thorax, was in the connective tissues. The very close relationship of the tumour tissue to the anterior and posterior surfaces of the sternum is in favour of this view, as is also the tolerably definite limitation of the intrathoracic mass to the anterior mediastinum. The association of the tumour, also, with

† Loc. cit., p. 84.
CASE 12. TUBERCULAR TUMOUR OF THE ANTERIOR MEDIASTINUM.

a. Tumour.
b. Heart with Right Ventricle laid open.
c', c''. Right and Left Lungs.
d. Anterior layer of Pericardium turned to the left.
chronic endocarditis of the mitral valve is in favour of this view of its etiology.

It might, of course, be urged that, if the opinion as to the rheumatic origin of this mediastinal growth be correct, then it is scarcely logical to classify it as a tumour, in the strict acceptation of the term. Notwithstanding this, however, it is difficult to see how the mass described in the foregoing report could be regarded in any other light than that of a new growth. From what has been written in connection with Case 11, the practical outcome seems to be that, in all cases of fibrous tissue tumour of the mediastinum, the probable relationship of the thoracic lesion to the rheumatic diathesis should be carefully considered in any attempt to unravel the etiology of the condition.

IV. Tubercular and other Specific New Growths of the Mediastinum.—Tubercular tumours are probably among the most frequent of the tumour formations of the mediastinum, although it is probably not often that they attain to such dimensions as to cause inconvenience from their bulk alone. They may, however, give rise to very serious results in other ways, as shall shortly be pointed out. Occasionally such tubercular formations grow to very large size, and give rise to all the classical physical signs of an intrathoracic solid tumour, as is well illustrated in the example I am about to record. The case occurred in the practice of my friend, Dr. Samuel Johnston Moore of Glasgow, and was seen by Dr. James Finlayson in consultation. I was asked to perform the post-mortem examination, and I am indebted to the kindness of Dr. Moore for the notes of the clinical history of the case.

Case 12. Tubercular Tumour of the Anterior Mediastinum, associated with Tubercular Manifestations in various Glands and with Uterine Myomata; complicated with intense Pruritus, and Swelling of Left Arm resembling Phlegmasia Dolens.—The following are Dr. Moore’s clinical notes:

"Miss —— was 39 years of age, and still menstruating regularly. When 19 she had suppuration of the cervical glands on the left side, which had left several cicatrices, and she was never in the enjoyment of robust health. Six months prior to her death she was seized with what she describes as ‘intolerable itching all over her body,’ and pains in the muscles, which were supposed to be rheumatic in nature. She was advised to go to Buxton, where she remained for some time, taking the baths and waters without advantage. She
afterwards went to London, and was under treatment there for the intolerable itching. She came under my care on the 4th October, 1889, and her condition may be described in a few words. The pruritus kept her from sleeping, and her limbs and every part of her body she could reach were severely marked by scratching. On examination, the lungs, heart, and other organs were found normal, and there was no albumen, no sugar, and no bile in the urine; the pulse was regular, and equal on both sides; and on microscopic examination of the blood there was no great excess of the white corpuscles. The temperature was normal. There was an enlarged gland about the size of a pigeon's egg in the infraclavicular space on the right side. On percussion an area of dulness was observable, of about 3½ inches in diameter, under the upper part of the sternum, and extending equally to both sides, but it did not appear in the neck. The case was so interesting and peculiar that I asked Dr. Finlayson to see her with me on 29th and 31st October. The signs of an intrathoracic tumour seemed to us both to be conclusive; and there were absolutely no signs of an aneurismal character. The left arm was at this time much swollen, somewhat resembling the character of the swelling found in the leg in phlegmasia dolens; notwithstanding the swelling, a good sphygmonographic tracing was obtained from the left radial artery, which beat as strongly as the right. This swelling lasted for several weeks, but disappeared completely about a week before her death. At the consultation special attention was directed to an examination of the lower part of the right side of the abdomen, on account of pain felt in this region, or rather down the right thigh; but no definite swelling could be felt there. The diagnosis agreed on was:—Tumour in the anterior mediastinum, probably lymphadenoma, with perhaps some similar, but smaller mass, in the abdomen.

"For treatment she had iodide of potassium and arsenic; and the pruritus was much relieved by the use of pine baths and gentle friction when in the bath.

"Before her death the emaciation became extreme, and not only had the swelling of the left arm completely disappeared, but the enlarged gland, also, below the clavicle on the right side disappeared. She died on the 9th December, 1889, having been under my care from the 4th October previous."

Post-mortem Examination.—The following is an account of the autopsy, which, at the request of the physicians in attendance, I performed on the 11th December, 1889.

External Appearances.—The body is much emaciated; the skin is of a dark tawney colour, and somewhat scurfy, but no
marks of scratching are observed; no swellings are present on any part of the surface that could be regarded as glandular enlargements.

_Chest._—On raising the sternum a large white-coloured tumour, about 4 inches in diameter, is found lying behind the manubrium sterni, and occupying the upper portion of the anterior and middle mediastinum; the tumour is slightly adherent to the sternum, so that in raising this bone two or three little cartilaginous or bony particles are left sticking to its anterior surface. The lungs are quite non-adherent, except for a very few loose bands near the middle portion of the right. All the organs of the chest are removed _en masse_, and are not further dissected at present. A dissection is made beneath the right clavicle, and lying near its outer extremity an enlarged gland, about the size of a large hazel nut, is discovered. A similar dissection is made beneath the left clavicle, but no glands and no abnormality of the subclavian vein are detected. On the left side of the neck, just above the clavicle, depressed white cicatrices in the skin are seen, but a careful search detects no glands. The trachea and larynx are removed and present no abnormality.

_Abdomen._—The spleen is normal in size and soft in consistence, and in its substance a few yellowish, slightly caseous, ill defined nodules about the size of small marbles are found. The liver presents normal characters; and the kidneys are healthy, although the right is perhaps unduly movable from the absence of fat.

A careful search is made on both sides of the pelvis and sacrum, and in front of the vertebrae for enlarged glands, but with the exception of one mass, about the size of a large marble, situated at the brim of the pelvis, and lying close to the iliac artery near its origin, nothing is discovered. On section this mass is found to be a lymphatic gland totally converted into soft chalky material.

The uterus is enlarged, and in its walls are found numerous myomatous tumours varying in size from a green pea to a walnut. From the os uteri a glairy mucus exudes, and on section a considerable amount of fluid blood escapes from the organ.

_Dissection of the Tumour._*—The specimen, as preserved for the Museum, consists of the growth, the heart and pericardium, both lungs, the bifurcation of the trachea, the thoracic oesophagus, the arch of the aorta, and the pneumogastric and phrenic nerves. The tumour lies in the upper part of

* Glasgow Royal Infirmary Museum, Series X, 234 B.
the anterior and middle mediastinum; in vertical diameter it measures about 4 inches, and in transverse about 3. It is firmly adherent to the anterior margin of the upper lobe of the right lung for a distance of 2½ inches; but on dissection it was found that it can be easily separated from all the other structures, except the innominate veins. Neither the trachea nor the oesophagus is in the least affected by the growth, and on turning these aside it is found that the arch of the aorta and the great vessels can be cleanly dissected from the posterior surface of the tumour, in which distinct grooves marking their position have been left. The right innominate vein and the superior vena cava are firmly adherent to its posterior surface, along their anterior and left aspects. The left innominate vein passes right through the substance of the tumour at a considerable depth from its sternal aspect, and a piece of coloured glass rod has been introduced, which easily enters the superior vena cava. The pericardium is not in the least affected by the tumour, there being no trace of pericarditis; the heart is highly fatty, the external adipose tissue being greatly increased in amount.

Posteriorly, the parts brought into view are the descending aorta, the oesophagus, the trachea, and both pneumogastric nerves, with the oesophageal plexus. The interior of the tumour was exposed by a longitudinal incision parallel to the plane of the anterior and posterior surfaces. The cut surface is seen to be coarsely fibrous, with here and there rounded areas of caseation. At one point, near the upper extremity of the growth, the caseous change has gone on almost to the formation of an abscess cavity—the softened tissue having a green-coloured, purulent appearance.

The naked eye characters are quite indicative of a chronic tuberculosis of the thoracic glands, an opinion which is borne out by the histological appearances revealed by microscopic examination of sections of the tumour. On microscopic examination of the spleen, rounded nodules, composed of small cells, and having the characters of tubercles grouped together, are seen. The round-celled nodules are surrounded by masses of brown coloured pigment. The gland removed from beneath the clavicle presents for the most part a fibrous structure, with here and there groups of round cells, sometimes showing a tendency to caseation. A search for the tubercle bacillus in the primary tumour was not successful; but, in the presence of the macroscopic and microscopic characters, and having regard to the manifestations of tubercular disease in other parts, there could be little doubt of the tubercular nature of
the mediastinal mass. The enlarged gland in the abdomen, which had undergone calcareous change, was in all respects similar to what is frequently seen in healed mesenteric tubercle; and the cicatrices in the neck had all the characters of those resulting from strumous disease of the cervical glands. Around the numerous areas of caseous softening in the substance of the tumour the tissue had a dense and tough fibrous character, as if the tuberculosis had induced a fibroid, as well as a caseous, process.

The chief point of interest in this case is the very severe itching to which the patient was subject for six months before her death. I have often wondered if there could be any connection between the mediastinal tumour and the intense pruritus, the severity of which seems to have been regarded as something quite unusual by the physicians in attendance. Whether there may have been nothing more than a coincidence, or whether the tumour, by involving the nervous plexuses within the chest, may have been directly the cause of the itching, I cannot pretend to say. The association of the two conditions was very peculiar, and is deserving of record. Another element in the case worthy of comment was the presence of multiple myomata of the uterus. This is a feature of some interest when it is associated with the great tendency to fibrous tissue development around the caseous nodules in the substance of the intrathoracic tumour.

Tuberculosis of the Tracheo-Bronchial Glands.

Tubercular enlargement of the tracheo-bronchial glands is an exceedingly common affection in children, and may, or may not, in the first instance, be associated with a tubercular condition of the lungs. The chief phenomena of this affection are well known, and are to be found fully discussed in all the standard textbooks on the diseases of children. As a general rule, the enlargement does not go on to such an extent as to render it easily detectable by the application of the ordinary physical methods during life, but the symptoms are well recognised, and from these a correct clinical diagnosis is frequently possible. Among the chief of the symptoms are attacks of an asthmatic nature, hoarseness of the voice, and paroxysmal cough. The asthma may be due either to pressure upon the nerves or to obstructive pressure on the trachea or main bronchial stems, and in
the last case the respiratory distress is mainly during the expiration. Dr. Eustace Smith has described a physical sign which may often lead to the diagnosis of this condition in its early stages.* When the glands are enlarged, if the child be directed to bend the head backwards so that the face looks towards the ceiling, a venous hum may be heard on the application of the stethoscope over the manubrium sterni, which disappears as the head is brought forward. This sign is developed by the enlarged glands being carried forward by the lower end of the trachea and pressing upon the left innominate vein, and it only takes place when the bifurcation of the trachea is freely movable. It is unnecessary to dwell further upon the signs and symptoms of this affection of the glands, as they are fully described in such works as those of Eustace Smith and Ashby and Wright.

It is important, however, to bear in mind the serious complications to which such affections of the bronchial glands may give rise. Pathologists are quite familiar with them in the post-mortem examination of adults, and they are frequently found to be responsible for the production both of local tubercular lesions in the lungs and of acute miliary tuberculosis. From the close relationship which the affected glands bear to the main branches of the pulmonary blood-vessels arises the fact that they frequently give rise to disseminated miliary tuberculosis by the direct entrance of the tubercular virus into the blood.† Cases are on record, and I have myself seen such, where a caseating tubercular gland has perforated the wall of one of these vessels, the morbid tissue thus projecting into the blood stream and sowing the virus broadcast.

By perforating the bronchial wall, such infective glandular tumours may produce the most intense localised tubercular processes in the lungs, the infective material being sucked into the lung by the inspiration. In the case of children, such a perforation of the main bronchi has given rise to severe and even fatal suffocative symptoms. These serious results are so well known to hospital physicians and pathologists, that it is unnecessary at present to cite cases illustrating them in detail; but I may briefly refer to a quite recent case of my own as an example.‡ The patient was admitted to the wards

‡ Pathological Reports, Glasgow Royal Infirmary, No. 341, 17th June, 1891.
of the Glasgow Royal Infirmary, suffering from the signs and symptoms of dry pleurisy in the right side. While in the ward he developed symptoms of very acute tuberculosis, and died. At the post-mortem, widely generalised acute miliary tuberculosis of a very intense kind, and a limited area of very acute caseous pneumonia at the base of the right lung, were discovered. The bronchial glands were much enlarged, and highly caseous; and scrapings from them were found to be teeming with tubercle bacilli. They were closely related and adherent to the walls of the great pulmonary vessels, and although no actual point of perforation could be discovered, there was no doubt as to this having been the cause of the acute miliary tuberculosis. On examining the bronchus going to the patch of acute catarrhal pneumonia, a small ulcer on its mucous surface was found, the floor of which was formed by the exposed tissue of one of the suppurating glands, a morbid feature which at once fully explained the local pulmonary condition. This was the second autopsy on the same morning in which a disseminated miliary tuberculosis was found to be associated with marked enlargement and tubercular caseation of the bronchial glands.

Syphilitic Formations.

I have myself had no experience of syphilitic tumours of the mediastinum, but there is no reason why this region of the body should be exempt more than any other from this form of disease. When syphilitic formations arise in the mediastinum, they are very likely to originate in connection with the bony structures of the thorax, and from these to extend into the thoracic cavity. In this connection, a specimen of gummatous disease of the manubrium sterni preserved in the Glasgow Royal Infirmary Museum is of considerable interest, as illustrating the mode in which syphilitic tumours of the mediastinum may arise.* The specimen shows very considerable enlargement of the manubrium sterni due to the syphilitic process, and the tumour of the bone has encroached for a good distance upon the space of the anterior mediastinum, as the swelling projects more from the internal than the external surface of the sternum. The patient, a labourer aged 40, also suffered from gummatous disease of the first, second, and third cervical vertebrae, which had given rise to wide-spread paralysis. There was a very

* Glasgow Royal Infirmary Museum, Series II, 59 A and 28 A.
clear clinical history of syphilis. This is the only case which I have personally met with that bears upon the subject of syphilitic mediastinal tumours.

V. Miscellaneous Tumours of the Mediastinum.—In the preceding sections have been discussed the tumours which are most frequently met with in the mediastinum. The present section, although it cannot be regarded as either a scientific or a logical sub-division of the subject, has been thought necessary in order that a brief reference might be made to those forms of mediastinal new growth which could not be included under any of the foregoing sub-divisions. Although, in the course of my own pathological experience, I have not met with any examples of intrathoracic tumours differing from those varieties already described, yet some other forms of mediastinal new growth have been recorded. Dr. Norman Dalton has recorded a case of enchondroma of the lung (right) and lymphatic glands of the mediastinum.* The patient was a man aged 44, who suffered from pain in the right side and arm. Enlargement of the glands above the right clavicle set in. The right arm became oedematous, and then thrombosis of the right external jugular vein occurred, to be followed by a similar condition in the left. The patient died comatose. At the post-mortem the mediastinal glands were found to be greatly enlarged, and closely involving the veins. In the anterior border of the upper lobe of the right lung there was a tumour the size of an apricot. On microscopic examination hyaline cartilage was found at the edge of the tumour, and developing in the walls of the air vesicles. The microscopic structure of the enlarged glands was similar to that of the external portion of the pulmonary tumour, which was found to be composed of fibro-cartilage.

Examples of teratoma have also been described as occurring in the mediastinum, and a typical case was recorded by Dr. James Gordon in 1825.† The patient was a stout young woman aged 21, who was first seen on account of the symptoms of pneumonia, and a "convulsive and suffocating" cough. In the course of a month or two a tumour developed beneath the sternal extremity of the left clavicle, which was supposed to be aneurismal on account of its pulsating strongly and regularly. The swelling slowly enlarged, and in the long run burst, nothing but a little serum escaping. This was followed by a period of good health, but some time afterwards

* Pathological Transactions, 1884, vol. xxxv, p. 82.
† Medico-Chirurgical Transactions, vol. xiii, part i.
the patient succumbed to an indefinite feverish attack. After
death the tumour was found to be pretty firmly adherent to
the sternum, and to have enveloped very closely, by means of
the connective tissue around it, the innominate artery. The
mass contained sebaceous matter, hair, teeth, and a fragment
of bone closely resembling the superior maxilla. The nature
of the growth at once became apparent.

It is also quite conceivable that primary tumours, originating
in connection with the ribs, the bodies of the vertebrae, or the
sternum, may grow in such a manner as to involve the
mediastinum, and thus give rise to many of the signs and
symptoms of primary solid growths of that region.

It has been pointed out that tubercular enlargement of the
mediastinal glands is an exceedingly frequent form of disease.
It is also within my experience that these glands may undergo
very considerable simple enlargement, so as at the time of the
*post-mortem* examination to form tumours of some size. In
cases of severe acute pericarditis, with much fibrinous and
serous exudation, it is not at all uncommon to find a marked
enlargement of the lymphatic glands in the neighbourhood of
the base of the heart. About two years ago I met with a
very striking example of mediastinal gland enlargement,
associated with severe fibrinous pericarditis, the specimen
having been preserved in the Glasgow Royal Infirmary
Museum. In this case, however, it may be doubted whether
the enlargement of the glands was altogether simple and non-
specific, for the following reasons:—The patient, an elderly
seafaring man, was under my care in Ward III of the Glasgow
Royal Infirmary, and he seemed to be at one and the same
time the subject of the malarial, the tubercular, and the
syphilitic diathesis. The ague was proved *post-mortem* by
the enlargement of, and the pigmentary changes in, the spleen;
the pericarditis looked quite simple to the naked eye, but on
histological investigation miliary tubercles were discovered in
the inflamed membrane, and, on staining with the Ziehl-Neelsen
fluid, tubercular bacilli were seen in some of the tubercles;
in the liver were nodules presenting all the characters, naked
eye and microscopic, of gummata. The glandular enlarge-
ment, therefore, in this case may not have been quite simple,
but there can be no doubt that in cases of simple pericarditis
a pure irritative swelling of the mediastinal glands does
occur.

*(To be continued.)*
EXOPHTHALMIC GOITRE: A CLINICAL STUDY.

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(Continued from p. 100.)

[The small figures in the text refer to the Bibliography at the end.]

Symptoms referable to the Heart and Circulation.—Though the condition of the heart and the blood-vessels has been so fully detailed in the case just recorded, that it seems almost unnecessary to refer to it any further, yet the following brief summary may not be out of place:—Of the primary symptoms of exophthalmic goitre the most constant, and usually the first in order of development, is increased frequency of the action of the heart, accompanied by increased pulsation in the larger blood-vessels. The least emotion or the slightest physical exertion tends to aggravate the excited condition of the heart’s action, and the palpitation, at first paroxysmal, gradually becomes more and more constant. The patient is often painfully conscious of the thumping tumultuous action of the heart, whose beating, according to Graves, can sometimes be heard at a considerable distance from the chest wall—“at least four feet.” Inspection reveals a tumultuous heaving over the cardiac area, and the apex beat has lost its punctuate character, and is diffuse and wide-spread. Unless changes due to dilatation or hypertrophy have set in, there is not usually any increase in the area of cardiac dulness. As has been already said, the sounds are loud, but as a rule auscultation reveals no murmur, except in those cases when, from general anæmia and consequent dilatation of the ventricular wall, a systolic murmur is heard following the first sound. The pulse is rapid, usually from 90 to 150, but rising under excitement even as high as 200, and frequently so small, irregular, and intermittent as to be almost uncountable. During bad paroxysms of palpitation the patient may suffer from dyspnoea, approaching cardiac asthma in its severity, and one of its characteristic signs is that the remedies usually employed against such conditions produce little or no effect in alleviating the symptoms. Although the pulse at the wrist is often remarkably feeble, the largest sized blood-vessels dilate and pulsate forcibly. This increased pulsation is always well marked in the vessels of the neck, over which a systolic murmur can almost invariably be heard; but it is probably
general all over the body, as in a few instances it has been observed that there was distinct pulsation in the retinal bloodvessels.* The veins of the neck are also sometimes dilated, and an anæmic souffle along their course can frequently be heard. Symptoms indicative of general circulatory disturbances, as evidenced by blushing, flushing, sudden perspirations, &c., &c., are nearly always present, even in those cases where the primary symptoms are not pronounced.

Symptoms referable to the Thyroid Gland.—The physical characters of an enlarged thyroid have already been described, and it will now, therefore, be unnecessary to do more than allude to one or two general points. The patient usually complains of "swelling of the neck" shortly after the disturbances of circulation have set in, but although that order in development is the rule, the goitre may appear at any time during the course of the disease. A few cases have been recorded where from first to last no trace of enlargement was ever detected in the thyroid. The tumour is very seldom so large as in cases of ordinary endemic goitre; and, as a rule, except that a choking sensation is frequently complained of, and that there is some difficulty in adjusting a collar, the patient suffers but little inconvenience. In Wilk's case, however, the left lobe of the enlarged thyroid extended down into the chest, and altered the shape of the trachea. Bristowe has recorded a case where death took place during an attack of dyspœnia brought on by the pressure of the goitre upon the trachea and the surrounding parts. In another case mentioned by the same observer the girth of the neck was 14½ inches, and the compression of the trachea by the enlarged thyroid was so obvious that it was determined to extirpate the isthmus of the gland. It was then found that "the trachea at the seat of operation was flattened from side to side, and in front formed an acute angle." As Graves pointed out, the enlargement of the thyroid varies from time to time, and is always increased when the attacks of palpitation are most violent. This of itself would tend to suggest that the goitre is, at least in part, the result of vascular turgescence; and the enlargement of the superficial veins over the tumour, together with the increased arterial pulsation, the peculiar thrill felt on palpation, and the blowing murmurs heard on auscultation, go a long way to confirm the theory.†

* As to this point see p. 185.
† Stokes relates that in the days when exophthalmic goitre was little known, "a case of this condition of the thyroid gland in a young woman was actually mistaken for aneurism, and a day appointed for performing the operation of tying the carotid artery."
After a time the gland becomes firmer in its consistency, and this change is probably brought about by an increased development of its connective-tissue elements. The enlargement of the thyroid is frequently unsymmetrical, and the right lobe is usually the larger (see Plate). Fitzgerald has advanced the theory that this frequent enlargement of the right side is due to the intimate relationship which the right vagus nerve bears to the embryonic heart, in consequence of which it has, all through life, a greater inhibitory power over cardiac action than the left has. He therefore thinks that in exophthalmic goitre the right vagus is more affected than the left. But, whatever theories may be held upon that point, the anatomical facts must not be lost sight of. In the normal condition of parts the right lobe of the thyroid is almost invariably larger than the left, and consequently any enlargement of the gland as a whole must be more marked upon the right side.

Symptoms referable to the Eyes.—Eye symptoms, with the exception of a pronounced exophthalmos, were absent in the case which has been fully detailed, but in the symptomatology of this disease they hold an important place. The prominence of the eyeballs is usually the last of the three cardinal symptoms to make its appearance, but occasionally it precedes the other two by a considerable time. It generally develops equally and simultaneously in the two eyes, although cases have been recorded in which the exophthalmos came on earlier in one eye than in the other (Reith), and Burney Yeo has recorded and figured a case in which the prominence implicated the left eye, whilst the right side of the thyroid was enlarged, and vice-versa. This crossing of the symptoms in unilateral cases is by no means common, the rule being that the enlargement of the thyroid is most marked upon the same side as the exophthalmos. Sometimes it may be altogether absent, and several writers look upon it as the least constant of the three cardinal symptoms. It varies much in degree in different cases, and in the same case from time to time. It has been noticed to increase or diminish in proportion to the severity of the palpitation, and to vary with the menstrual period. It has even been observed to disappear altogether, leaving the goitre and the heart affection as bad as before. After death the eyes are scarcely, if at all, prominent, although this is not always the case. Sometimes it is so slight in degree as to be scarcely noticeable, while in other cases the prominence is so extreme that the lids cannot be closed over the exposed sclerotic, and Trousseau mentions a case where the eyeball
was actually dislocated from its socket. Except in extreme and long continued cases, the exophthalmos may be reduced by pressing the eyes back into the orbit, but it immediately returns whenever the pressure is removed. As distinguished from exophthalmos of orbital origin, it is only rarely that there is any impairment of the mobility of the eyes, and strabismus has hardly ever been noticed; but Bristowe has recorded a case complicated by ophthalmoplegia externa, and other instances of paralysis of ocular muscles in Graves' disease are on record. Silcock found fatty degeneration of the recti and obliqui muscles in a case which he examined post-mortem. It has been affirmed that in addition to the proptosis there is an actual increase in the size of the eyeball itself; and if this be so, it is not difficult to explain the occurrence of myopia during the course of this disease. Except as a result of complications, vision is very seldom affected, and in the great majority of cases pupillary symptoms are entirely absent. The exceptional cases in which contraction, dilatation or inequality of the pupils has been noted, acquire an importance as bearing upon the pathology of the disease, because in all cases where there is undoubted evidence of irritation of the cervical sympathetic the pupils are invariably dilated.

In the face of the generally accepted opinion that in Graves' disease all abnormal pupillary phenomena are absent, and Von Graefe's statement that in nearly two hundred genuine cases of the disease he had never once seen dilatation of the pupil, it will be necessary to examine those anomalous cases with the greatest care before admitting them to be examples of exophthalmic goitre. Pain in the eyeballs is very seldom complained of, but increased lachrymation is a frequent symptom. The close connection between the fibres of the sympathetic and the fifth cranial nerve may serve as an explanation of the last symptom; and this is all the more likely, as other affections of the trigeminus have been observed. Thus, Berry mentions the existence of a certain degree of anaesthesia of the cornea, and Lang and Pringle record a case in which there was acute pain in the eyeballs, accompanied by profuse scalding lachrymation, with increased sensibility on pressure over both supra-orbital foramina, and diminution of ordinary sensibility over the distribution of the right supra-orbital nerve. These neuropathic symptoms are of great interest in connection with those cases, when, from the undue exposure of the eyeball, disturbances of its nutrition occur. In cases where the prominence is so great as to prevent
the eyelids from closing perfectly, the eye suffers from exposure, and a moderate amount of conjunctivitis is met with; but mere want of protection of the eyeball is hardly sufficient to account for the very rapid destruction of the cornea which occasionally occurs, and as a result of which the patient's vision is placed in the greatest danger. Such cases seem analogous to those of neuro-paralytic ophthalmia, which follow in paralysis of the fifth nerve, and in the rapidity of the destructive process contrast strongly with inflammatory mischief resulting simply from undue exposure—e.g., in lagophthalmos caused by paralysis of the facial nerve. Happily such severe cases are not frequently met with; but, when they do occur, the prognosis is serious, not only for the vision, but also for the life of the patient. One such case, of which I have notes, occurred in Dr. Reid's practice at the Glasgow Eye Infirmary. This patient was a girl aged 21, who was admitted to the hospital on 4th July, 1888. The early history of the case is incomplete, but for at least three years she had suffered from palpitation, enlargement of the thyroid, and exophthalmos. Very shortly after the onset of her illness she began to suffer from lachrymation and inflammation of the eyes whenever she exposed herself to the slightest cold. In April her eyes had become so bad that she had to give up work, but her medical attendant stated that corneal ulceration was observed for the first time about the end of June, when the left cornea became implicated and sloughed very rapidly. A few days afterwards the right cornea also became affected. On admission both eyeballs were so prominent that the eyelids could not be closed over them. There was considerable chemosis of the ocular conjunctiva. The left cornea was ulcerated throughout its whole extent, and there was a large prolapse of the iris. A sloughy ulcer occupied the greater portion of the right cornea, which seemed almost wholly devoid of its epithelial layer. There was no paralytic affection of the limbs, but the patient was quite unable to walk, and was very much excited. Her sister stated that she was quite worn out by the travelling, but that she had been very excitable ever since her vision had become affected. The pulse was very irregular, and beating 120 per minute. The heart was thumping in its action, with a diffuse apex beat; but no murmur could be detected. In spite of all treatment the eyes rapidly got worse, and by 13th July the lens had escaped from the left eye, and the cornea of the right had given way. The general condition was one of gradually increasing weakness. Narcotics had little or no influence in procuring sleep, so that day and night.
the patient continued restless and delirious. At times she was wildly maniacal, and it was with the greatest difficulty she could be kept in bed. Her face was much flushed, and she perspired very freely. She had a particularly bad night on 18th July, and next morning the temperature was 104° F., the respirations 26, and the pulse so rapid and irregular as to be almost uncountable. On examining the chest slight dulness on percussion was detected at the extreme right base, but none of the auscultatory signs of consolidation could be detected. The patient steadily got worse, and died somewhat suddenly in the afternoon of the same day. Unfortunately the relatives would not allow a post-mortem examination of the body to be made.

Trousseau accounted for the exophthalmos by attributing it to turgescence of the blood-vessels of the orbit, and others, in addition to this, have supposed that there is an increase or swelling of the orbital fat; but in Silcock's case, previously referred to, post-mortem examination showed "that the orbital fat was normal and not in excess." A third theory is that the exophthalmos is due to contraction of a layer of unstriped muscular fibre, which H. Müller has described, bridging over the sphen-o-maxillary fissure. This muscle is also found in the upper and lower eyelids, and although from its scanty development in man as compared with some other animals, it cannot play a very important part in the causation of the exophthalmos, yet it is generally admitted that another sign—namely, retraction of the upper eyelid, is due to the contraction of these unstriped muscular fibres of Müller. This undue retraction of the upper eyelid is usually described as Stellwag's sign, but it was certainly observed by White Cooper, who, as early as 1849, wrote in the Lancet that "the expression given to the countenance by this protrusion of the globes and the unnaturally elevated lid is very peculiar, and the aspect is that of the wildest terror." Stellwag also drew attention to the fact that associated with this undue retraction of the upper lid there is also a diminished frequency in the act of involuntary winking, and to this cause he attributed the occurrence of lachrymation, which, as we have seen, is so frequently met with in this disease. As Stellwag's sign, when present, is usually one of the earliest symptoms of exophthalmic goitre, it is of considerable value in the diagnosis of incomplete cases; and Berry has drawn special attention to the fact "that it is not met with in other forms of exophthalmos." He adds, further, that it is therefore "a point of diagnostic importance in the cases where exophthalmos is confined to one side, or not
accompanied in a marked degree by the other symptoms characteristic of Graves' disease." Retraction of the lower lid is very uncommon, but three instances of its occurrence are quoted by Hill Griffith.28

Another eye symptom of considerable interest was first described by Von Graefe.44 It consists of a disturbance in the voluntary movements of co-ordination, and may be described as a dissociation of the movement of the eyeball and eyelid, when the glance is directed upwards or downwards. This sign is probably due to a central lesion, and is certainly not a paralysis produced by the prominence of the eyeball, because in the act of closing the eyes the lids descend perfectly, and while it may be entirely absent in cases where the exophthalmos is very pronounced, it may be very well marked in other cases where the prominence of the eyeballs is hardly noticeable. Like Stellwag's sign, it often occurs very early, and Byrom Bramwell mentions a case in which both these signs were well marked, but there were no other symptoms of exophthalmic goitre present. In that case the symptoms were supposed to be due to reflex irritation from the presence of decayed teeth. Von Graefe considered this sign pathognomonic of exophthalmic goitre, but subsequent experience has by no means confirmed this, although it may occur as the only eye symptom in the course of a case of the disease, and may be present in both eyes, when the exophthalmos has only affected one of them. Jessop23 has called attention to the fact that both the Stellwag and the Von Graefe symptoms can be produced by instilling cocaine into the eye, and from this observation he concludes that they are produced by an irritation of the cervical sympathetic; but, as I shall have occasion to point out further on, a condition of spasm due to nervous irritation persisting over a long period of time is without any physiological analogy. A modified Von Graefe sign was observed in the following case:—Isabella S., aged 39, was admitted to the Glasgow Eye Infirmary on 11th January, 1890, under Dr. Reid's care. Exophthalmos was well marked in both eyes, but the right was much more prominent than the left. The thyroid gland was enlarged, but the swelling was for the most part confined to its right lobe. The patient suffered very much from palpitation, the pulse was irregular and rapid, the thumping action of the heart was visible over a large extent of the cardiac area, the sounds were loud, and a distinct V.S. murmur was audible over the mitral area. Stellwag's symptom was well marked, and Von Graefe's sign was present, but modified in so far that, although the upper lid seemed at first to
follow the downward glance, yet when the gaze was directed further downwards it lagged behind, and after a few seconds was spasmodically retracted so as to leave a large surface of the sclerotic exposed. The pupils responded both to stimulus of light, and in the act of convergence they were somewhat dilated, but as the patient was highly myopic not much importance could be attached to the significance of this symptom. Ophthalmoscopic examination revealed some atrophic patches in the choroid, but there was no undue tortuosity nor pulsation of the retinal blood-vessels. The patient was very emotional and inclined to be melancholic. She stated that her symptoms had been coming on gradually for several months past, but she could assign no cause for the appearance of the disease. There was no disturbance in menstruation.

Ophthalmoscopic examination usually yields negative results in exophthalmic goitre. The pulsation in the retinal arteries first described by Otto Becker as occurring in six out of seven cases examined is not nearly so frequent, according to other observers, although we might reasonably expect to find in the retina some indication of that strong pulsation which, under the influence of the excited action of the heart, is almost constantly present in the blood-vessels of the head and neck. Hill Griffith examined specially for this sign in thirty-two cases of exophthalmic goitre, and did not find it in a single case. Pulsation in the retinal veins is frequently seen, but as this phenomenon is met with frequently in so many different conditions of the fundus, no diagnostic value can be attached to it. I have, in only one case of exophthalmic goitre, seen slight oedema of the optic disc, and that was in a gentleman rather over 60 years of age. He consulted me on account of an attack of conjunctivitis in his left eye, but a well marked exophthalmos at once attracted attention, and on making enquiry the following facts were elicited:—More than a year before he was under medical treatment for very distressing palpitation, accompanied by dropsical swelling of the extremities. He was confined to bed for several weeks, but at the end of that time he had recovered sufficiently to admit of his resuming his business duties. Shortly afterwards, however, without any assignable cause, it was observed that both eyeballs were becoming very prominent. The exophthalmos had varied in degree, having been much worse than it was at the time of my examination. There was no increase in the palpitation at the time of the onset of the eye symptoms, nor has there ever been any return
of the dropsical swelling. Both eyeballs were markedly prominent, but the exophthalmos was rather more pronounced on the left side than it was on the right. There was increased lachrymation in both eyes, and a subacute conjunctivitis in the left. The eyeballs were perfectly covered and protected when the eyelids were closed. The Stellwag and Von Graefe symptoms were both absent. By means of gentle pressure the exophthalmos could be reduced, but it immediately returned whenever the pressure was removed. This operation was attended by slight pain. Vision was absolutely normal. Ophthalmoscopic examination revealed slight oedema of both the optic discs, with increased tortuosity and pulsation of the retinal veins, and increase in the size and number of the smaller blood-vessels on the surface of the disc. There was a glistening white patch at the upper and outer aspect of the right fundus, but there was no evidence of any inflammatory exudation along the course of the blood-vessels or in the neighbourhood of the optic disc. There was no enlargement of the thyroid. Tremor was well marked. The pulse was small and irregular, and beating considerably over the 100 per minute. The urine was pale in colour, of specific gravity 1012, but contained no albumen on the one occasion on which I had an opportunity of examining it.

_Tremor._—Charcot was the first to direct attention to this symptom, which, on account of its frequency, he regarded as one of the cardinal features of the disease. It was carefully investigated by Marie, who described it as "a perpetual vibration," and said that, "standing or seated, all the body seemed to be in a continual tremor." Wolfenden says of it that, while in paralysis agitans one can see the tremors at a glance, in exophthalmic goitre it may be necessary to take hold of the patient's hand before the fine vibrations characteristic of the trembling movements can be noticed. In so far as this tremor does not affect the individual digits (Charcot), it differs from the trembling movements which are present in other diseases—e.g., alcoholic tremor, &c. It is always aggravated by muscular fatigue, or under conditions of mental excitement. Thus, West tells of a patient who, worn out with nursing her sick children, was seized with trembling so severe that "she could hardly stand;" and Trouseau relates a case in which the patient became so excited that she was unable, on account of trembling, to sign her daughter's marriage contract. This symptom acquires its

* Mr. Victor Horsley has observed that fine tremors occur in monkeys after the extirpation of the thyroid gland.
chief importance from the fact that it is an early manifestation of the disease, and is therefore helpful in the diagnosis of "incomplete" cases. It may be the initial symptom, as in an interesting case related by Mobius, where a woman, after painful moral emotions, suffered from tremor of the left hand resembling paralysis agitans, and soon afterwards all the symptoms of exophthalmic goitre developed. In some cases this tremor amounts to spasmodic movements; at other times the spasm may be so persistent as to resemble tetany; and Mackenzie speaks of painful cramps as a frequent complication. Muscular weakness, "a tendency of the legs to give way at the knees," hemiplegia, paraplegia, contracture of the paralysed limb, and altered cutaneous sensibility have all been observed in aggravated cases.

Symptoms referable to the Skin.—A pigmentation of the skin, in many respects resembling the Addisonian bronzing, is a not unfrequent accompaniment of exophthalmic goitre. Begbie and Trousseau both observed this symptom, and Dr. David Drummond drew special attention to it in a series of six cases which he published in 1887. This pigmentation may consist of a diffuse yellowish discolouration of the skin generally, or it may be distributed in patches, which, when they occur upon the face, are most commonly seen in the eyelids, and on the skin round about the orbits. Vitiligo, urticaria, and a greasy condition of the skin have also been seen in cases of exophthalmic goitre; and in this connection may also be mentioned local congestions of the skin, tache cérébrale, premature greyness of the hair and baldness, the loss of the eyebrows and eyelashes, oedema of the legs and of the eyelids, and atrophy of the mammas, which have all been noted by different observers as accompaniments of Graves' disease.

Diminution of the Electrical Resistance.—When the body of a presumably healthy individual is placed in the circuit derived from a constant current battery, its electrical resistance has been estimated to range from four thousand to five thousand ohms, but in exophthalmic goitre, as M. Vigouroux was the first to point out, the resistance which the skin offers to the passage of the current is remarkably diminished. Why this should be so is not very clear, unless it be that on account of the dilatation of the capillaries due to vaso-motor disturbances the skin becomes saturated with fluid, and thus the resistance of the non-conducting epidermis is reduced to a minimum.*

* In reference to this point, Dr. H. W. D. Cardew writes in the Lancet of 28th February, 1891:—"Most patients suffering from Graves' disease
Wolfenden states that there is "no disease in which the body resistance is diminished as it is in Graves' disease," and in two of the cases examined by this observer the skin resistance was reduced as low as two hundred and three-hundred ohms respectively. Although it is not pathognomonic of exophthalmic goitre, this symptom acquires a practical importance because, as Charcot says, it is "at once objective and measurable," and is therefore on that account an important sign to rely upon in the diagnosis of obscure cases. Byrom Bramwell mentions that he has observed a notable diminution of the resistance of the skin to the passage of electric currents in some cases of chronic alcoholic excess.

*Sympathetic Disturbances.*—A rise in temperature, probably the result of nervous disturbances, and quite independent of any inflammatory complications, is frequently met with in sufferers from exophthalmic goitre. But apart from actual pyrexia, as indicated by thermometric observation, the patients frequently complain of sensations of burning heat, attended by flushings and profuse perspirations. Angel Money records a case where a copious acid sweat confined to the central parts of the face broke out during attacks of palpitation—pulse 200. Uncontrollable diarrhoea is another of the sympathetic disturbances frequently observed. It differs from ordinary diarrhoea in so far that it comes on suddenly in paroxysms, and does not appear to be in any way related to digestive derangements in the stomach or bowels, as the tongue may remain clean and the appetite be unaffected. It is not amenable to treatment by the ordinary remedies, and passes off as suddenly as it came on. It has been supposed by some that it is analogous to the gastric crisis in locomotor ataxia, but it differs from these in the fact that the attacks are as a rule perfectly painless. The motions are profuse and watery—a kind of "intestinal sweating" it has been called. Byrom Bramwell mentions one case in which the motions were of a "pink colour." When the diarrhoea is persistent and accompanied by rise of temperature, intestinal mischief must be thought of, as tubercular complications are not uncommon in patients suffering from exophthalmic goitre, see p. 24. In any case the long continuance or the repeated occurrence of attacks of diarrhoea has a most injurious effect upon the patient's perspire more or less profusely, and as evaporation does not take place at a rate equal to that of secretion, the stratum corneum is covered with sensible perspiration, and its intercellular interstices and the orifices piercing it are filled with saline solution, which forms an excellent conducting medium between the internal fluid of the body and the electrodes placed on it."
nutrition, and added to the anaemia, which is a nearly constant feature of the disease, may precipitate a fatal result with great rapidity. Vomiting not related to the taking of food, and following any emotional excitement, is a not unfrequent symptom. The appetite varies in different cases, and is often capricious. Pulmonary symptoms characterised by irritating cough and profuse expectoration may also, in the absence of any more definite lung complication, be regarded as the result of vasomotor paralysis, and comparable with the profuse perspirations and the paroxysmal diarrhoea (Bramwell). Polyuria, glycosuria, and diabetes have also been observed in association with Graves' disease, and may be mentioned under this heading, because, from the fact that they vary with the condition generally, and disappear in many cases altogether when the general condition is ameliorated, they seem to be due to some mysterious alteration in function rather than to any organic disease.

Warburton Begbie first drew attention to the occurrence of transient albuminuria in patients suffering from exophthalmic goitre, and the association is now recognised as tolerably frequent. The albumen may be present in large amount, but it is unassociated with tube casts or other evidence of renal degeneration, and in Begbie's cases it was only present in urine passed shortly after a meal—i.e., the albuminuria was limited to the period of digestion. This form of albuminuria is intermittent, and usually lessens as the other symptoms improve.

Nervous Affections.—Headache, neuralgia, insomnia, somnambulism, and vertigo are frequently mentioned as accompanying symptoms in cases of exophthalmic goitre, and the association with epilepsy, chorea, and insanity has already been mentioned. It is unusual to find symptoms indicative of chronic organic disease of the nervous system (Gowers), but in five cases (Wolfenden) progressive muscular atrophy occurred, and Charcot has described an incomplete form of paraplegia characterised by a sudden failure of the legs owing to the knee-joints giving way. It is interesting to note that a similar giving way of the legs at the knee-joints has been observed in myxœdema.*

Psychical Symptoms.—A change in the manner and character of all patients is almost invariably met with. They are nervous, restless, excitable, easily put about, irritable,

* An interesting contrast between the symptoms of myxœdema and exophthalmic goitre has been worked out by Dr. Byrom Bramwell (Atlas of Clinical Medicine, p. 26).
and of uncertain temper. They are usually called wilful and hysterical, and as they are often capricious and difficult to get along with, they may be gravely misunderstood by their relatives and friends. In many cases the memory is impaired, and the patient, becoming low-spirited and emotional, feels quite unfit for work. There is mental depression and even melancholy. The feelings are easily excited, and there may be a maniacal tendency. These symptoms may culminate in actual insanity, which may take the form of mania, melancholia, or general paralysis of the insane (Savage, \(^54\) Johnstone \(^55\)). Of these three conditions the first is by far the most frequent, and, as in the case recorded at p. 182, an attack of acute mania may precede or even be the cause of death.

**Hæmorrhages.**—In one of the cases recorded by Warburton Begbie, repeated attacks of epistaxis were present at the onset of the disease, and Stokes mentions the case of a man in whom long continued bleeding from hæmorrhoids seemed to have a causal relation to the disease. Trousseau has drawn attention to the occurrence of various internal hæmorrhages; and it is interesting to note that epistaxis, slight hæmoptysis, and a typical purpuric rash were present towards the end of L. M'M.'s case, and also that at the post-mortem examination the pericardium contained fluid blood, and that numerous hæmorrhagic blotches were found both in the pericardium and in the endocardium.

**General Health.**—In some cases the general health of the patient is not much affected, but emaciation is always a striking feature in severe cases, and Mackenzie states that "it is generally a sign that the disease is active." Anæmia or chlorosis is an almost constant accompaniment, and disorders of the menstrual function are met with nearly as often. Enlargement of the lymphatic glands, somewhat resembling lymphadenoma, may occur during the course of the disease. It is not easy to understand in what relation enlargement of the lymphatic, the tracheal, and bronchial glands, or of the spleen, bears to the primary disease, but in a fatal case of Gowers', in which glandular enlargements were present, the patient's sister suffered from lymphadenoma.

**Pathology.**

While any of the various theories which have been advanced with regard to the origin of this mysterious disease may suffice to explain individual symptoms, none seems sufficient to account satisfactorily for the entire complex
presented by it. Its frequent and almost constant association with anaemia suggested to the elder Begbie and others a causal relation, but obviously the symptom complex of exophthalmic goitre and simple anaemia is in no necessary relation. Besides, as Sattler\(^{56}\) points out, the disease shows itself occasionally in persons who are up to the time of its appearance in the full bloom of health, and develops fully, it may be, in the course of a few days. Illustrations of this sudden and rapid development have already been referred to. Stokes looked upon the disease as a neurosis of the heart, and “perhaps also of the cervical vessels themselves,” and Graves himself also spoke of it as a neurosis.

The enlarged thyroid obviously, in many cases, causes pressure upon the cervical sympathetic, and Koeben,\(^{57}\) a pupil of Romberg, was the first to seek in this pressure upon vessels and nerves an explanation of the whole complex of the symptoms of the disease. But it is to be noted that the series of symptoms is not always the same in order, and this theory of mechanical pressure could only hold good if the thyroid enlargement invariably preceded the other symptoms in order of development. Moreover, even granting such a sequence clinically, the pathological nexus is by no means clear, because in localities where goitre is endemic it is exceedingly rare to find patients who also exhibit cardiac and eye symptoms, and it is also well known that cases of true exophthalmic goitre frequently occur when the symptoms referable to the heart and eyes precede by a long time the swelling of the thyroid—this last, indeed, in some cases being absent throughout the whole course of the case. Charcot, while disclaiming Koeben’s theory, inclined to the sympathetic system for an explanation without, however, advancing any definite theories of his own except that he believed it to be of psychical origin. Aran,\(^{58}\) on the basis of Claude Bernard’s\(^{59}\) experiments, referred the exophthalmos to an irritation of the cervical sympathetic resulting in spasm of the musculus orbitalis of Müller; but a theory of irritation can at best explain one set of symptoms only, the others, if dependent upon any affection of the sympathetic at all, being necessarily due to a condition of paralysis. The increased frequency of heart action indicates irritation of the sympathetic, but the dilatation of the vessels and the goitre indicate paralysis. Moreover, while the protrusion of the eyeballs can be theoretically accounted for by spasm of Müller’s muscle, it must be remembered that this muscle is of very little account in man, and that the symptom can be equally well explained by a condition of vascular turgescence due to vaso-motor
paralysis. The existence of irritation on the one hand, and of paralysis on the other, suggests that there are two sets of fibres in the sympathetic, and that these are simultaneously affected by a causal lesion, just as in cases of peripheral neuritis—e.g., alcoholic, where pain and extreme sensitiveness to touch are associated with paralysis of the muscles. Benedikt has tried to explain all the symptoms by assuming that there is a condition of active irritation of dilator fibres which run in the sympathetic, while Friedreich, on the other hand, believes that in every case these same fibres are paralysed. There is no physiological analogy, however, to warrant the assumption that a condition of irritation of certain parts of sympathetic nerve fibres can persist for months and even years.

Pupillary symptoms indicative of disturbance of the sympathetic system are seldom present in well marked cases of exophthalmic goitre, but vaso-thermic phenomena, as *tache cérébrale*, inclination to blushing, transitory local reddening of the skin, erythema, urticaria, &c., along with subjective sensations of heat and cold, and even, in some instances, actual rise of temperature, are well known and tolerably constant symptoms. An explanation of this apparent anomaly has been sought in the experiments of Claude Bernard, who has shown that the oculo-pupillary and vaso-thermic centres are situated at different levels in the cord. Section of the two first spinal nerves produces oculo-pupillary symptoms, while section of the ascending cord of the thoracic sympathetic between the second and fourth ribs gives rise to dilatation of blood-vessels and elevation of temperature upon the side operated upon. Bernard also demonstrated that the vaso-thermic symptoms could be called forth separately and independently of the oculo-pupillary, and *vice-versa*. Geigel first advanced the idea that the point of origin of the lesion in exophthalmic goitre was to be sought not in the sympathetic in the neck, but at those centres described by Bernard. He assumed that the oculo-pupillary centre was in a state of irritation at the same time that the vaso-thermic was paralysed; but, as Eulenburg observes, this does not solve the problem, "but only transfers it from the peripheral trunk of the sympathetic to the sympathetic centres in the medulla spinalis cervical;" and it is no easier to understand how a common lesion can act so differently upon two centres so closely related to each other, and that these "opposite conditions should prevail for years together," than it is to explain "their co-existence in different fibres of the cervical sympathetic itself." The association of exophthalmic goitre with symptoms pointing to a
disturbance of the central nervous system—e.g., polyuria, albuminuria, glycosuria, &c., have directed attention to the medulla as the possible centre of origin of the disease; and moreover, Filehne’s experiments have shown, in one case at least, that destruction of the upper fourth of the restiform bodies can induce palpitation, goitre, and exophthalmos. In his operations, however, he implicated the vagus, and so paralysed its inhibiting action upon the heart. To a circumscribed and apparently not deeply reaching lesion of the vagus centre, by means of which its controlling influence over the heart’s action is limited or suspended, Sattler attributes the palpitation and the cardiac irregularity, and an extension of the disturbance to other vaso-motor centres gives rise to the goitre and the exophthalmos. The Von Graefe and Stellwag symptoms he relates to a lesion of the centre of co-ordination—namely, that centre from which the reflexes issue to connect the retina and the sensitive nerves of the conjunctiva and cornea with the motor apparatus of the eyelids.

Pathological anatomy fails to afford much evidence in support of any of the above theories, for which, in some cases (as in those collected by Eulenburg and Guttmann) changes, consisting chiefly in an overgrowth of the fibrous capsules and increase of connective-tissue elements at the expense of the proper nervous structure, associated with pigmentary changes, have been found in the cervical ganglia; there are other cases, equally carefully investigated, in which the ganglia were found perfectly healthy. In a recent case Hale White found hæmorrhages in the medulla in the neighbourhood of the nuclei of the sixth nerve, but a very limited pathological experience will be sufficient to show that hæmorrhages, apparently identical with those described by White, are not unfrequently found in the same part of the medulla in cases which at no time during life exhibited any of the symptoms of exophthalmic goitre. We cannot, therefore, in White’s case, attribute to the hæmorrhages any causal relation to the disease, unless it be, as he himself suggests, that they were the result of structural changes in the nerve tissue of the medulla, too delicate to be detected by our present methods of investigation. Bristowe has recorded four fatal cases in which a post-mortem examination was obtained, but in none of them was any lesion of the medulla, pons, or sympathetic nerves discoverable after careful microscopic examination. A careful study of the clinical history of exophthalmic goitre in the light of Bernard’s and Filehne’s experiments, together with the negative evidence of patho-
logical anatomy, tends to support a theory of the central origin of the disease; but it is probable, as Gowers suggests, that "the morbid state is one of function, and of that finer nutrition that baffles, and will baffle, our means of investigation."

**Course and Duration.**

Hulke\textsuperscript{28} says that Graves' disease "is the most definite and striking example which we can find of a severe and protracted malady, which, despite its severity and persistence, has yet a natural tendency to recover." Bristowe does not think that it is usually dangerous to life, while Gowers places the proportion of recoveries at about a quarter, and states that "in fully developed cases the prognosis is grave." Wilks\textsuperscript{28} regards "exophthalmic goitre as a curable disease," and West\textsuperscript{28} states that inasmuch as it is "rarely seen in the post-mortem room, and is also rarely of itself fatal, and yet on account of its rarity would hardly escape observation, and as it is most uncommon in old people, the conclusion is forced upon us that the symptoms must subside and the affection disappear." Reliable statistics, however, are wanting to confirm or refute these opinions, and this dearth of statistical evidence is not astonishing when one remembers how difficult it is to find opportunities of watching cases of exophthalmic goitre throughout their whole course. Many cases seen at the commencement of the illness cannot be traced afterwards, and so their subsequent history is lost. Moreover, the natural tendency of the disease, in many instances at least, is to remissions and intermissions; and the latter are sometimes so complete that the patient may be said to suffer from several separate attacks. Gowers knew a patient who had "three such attacks at intervals of several years." Charcot believed that pregnancy had a distinctly beneficial influence in procuring a remission of the symptoms, and in many instances a complete recovery from the disease. It has also been noted that in women exacerbations are closely related to the menstrual period.

As a rule the disease is slow and insidious in its onset, and runs a chronic course lasting over several years; but, as Trousseau pointed out, there is another class of cases which run a very acute course, and terminate rapidly either in recovery or in death. Moore relates the case of a girl who, after reading a letter informing her of the death of her brother, was suddenly seized with all the symptoms of exophthalmic goitre, which, however, passed off completely at the
end of two days. That is probably the shortest case on record; and, as far as I know, there is no case which has proved fatal within six weeks of the onset of the symptoms. Many cases which begin with very acute symptoms gradually subside into a chronic stage, and it is very rare, indeed, for death to occur before the end of the first year. It sometimes happens that one or other of the cardinal symptoms may disappear, and the others remain much as before—thus, for example, cases are known in which the exophthalmos was wanting while the tachycardia and the goitre persisted. When the eye symptoms, and those referable to the thyroid gland are strongly developed, the pulse rate very rapid, the tremor well marked, and emaciation actively progressing, the prognosis is necessarily unfavourable, but even in the most unpromising cases, if the patient can be properly cared for, good therapeutic results may be obtained. The following case, which I first saw three years ago, is a good example:—The patient was a machinist, about 24 years of age, who, nine months before I first saw her, began, as a result of domestic troubles, somewhat suddenly to develop all the characteristic symptoms of exophthalmic goitre. Her eyes were very prominent, and could only with difficulty be covered by the closed eyelids, but both the Stellwag and Von Graefe symptoms were absent. The thyroid gland was much enlarged, with the swelling most pronounced on the right side. The palpitation was very distressing, and the pulse so rapid and irregular that it could not be accurately counted, but as far as could be made out there was no organic heart affection. When she came into my consulting room she was literally trembling all over, and was so nervously excited that she could scarcely tell me about her symptoms. She had been steadily losing flesh, and expressed herself as feeling very ill. The menstrual function was in abeyance. This patient was carefully treated by my friend, Dr. Couper, for more than a year by means of rest, nourishing food, and general blood tonics, and when I had an opportunity of seeing her again at the beginning of June, 1891, her condition was as follows:—The exophthalmos, though distinctly noticeable, had become very much less, the swelling of the thyroid was much reduced in size, and felt firmer on palpation, and the right lobe was still the larger. The pulse was steady and regular, and beating below 100 per minute. The tremor had practically disappeared, and there had been a considerable gain in weight. There was still nervousness and a tendency to excitement, but the patient was now able to be regularly at her employment, and stated that her own
feeling was that she was quite well. She still suffered from amenorrhoea.

In many cases of exophthalmic goitre death takes place as a result of some intercurrent disease, and in a few instances has occurred without warning. Hale White states that death took place suddenly in two out of seven fatal cases, which he had an opportunity of examining, and other cases are mentioned by Mackenzie. The exact cause of death in the latter instances could not be determined on post-mortem examination. In the more chronic cases some heart affection, a cerebral haemorrhage, or some form of tuberculosis are the pathological lesions which have been most frequently found.

**TREATMENT.**

In a disease of which the pathology is so obscure, and the etiology so closely related to psychical and emotional disturbances, it is not surprising that in many instances the therapeutic results are disappointing. As a general rule, the more uncertain the action of medicinal agents in any given disease the greater is the number of remedies recommended; and so in exophthalmic goitre a mere catalogue of all the drugs, the employment of which has been advocated by some and condemned by others, would occupy a very considerable space. Such a list would, however, serve no useful purpose. Medicines which seem to be distinctly useful in one case prove signal failures in another, although the two cases are, to all appearance, similar. The older writers who believed that a condition of blood-poverty was the starting point of the disease strongly advocated the use of iron and blood tonics generally, while others, amongst whom must be included Trouseau and Von Graefe, affirm that iron not only does no good, but in some cases does positive harm by increasing the palpitation and accelerating the pulse rate. Von Graefe, however, adds that, after the rate of the pulse falls below 100, iron does good. Other authorities have specially recommended tonics and drugs which lower the pulse, but, as has already been mentioned, the ordinary medicinal agents employed for this purpose have very little control over the palpitations symptomatic of exophthalmic goitre. Of all drug treatment in this disease probably that from which the best results are most frequently obtained is the use of belladonna and its alkaloid atropine; but ergot, the bromides, and the iodides, in spite of all that has been written in their favour, rarely fail to give most disappointing results.
In 1865 Benedikt first treated the disease by the application of electricity to the cervical sympathetic. He stated that while the current was passing the pulse became slower and that both the swelling of the thyroid and the protrusion of the eyeballs became markedly less. Although in L. M'M.'s case the galvanism certainly seemed to be productive of good, and a slight fall in the pulse rate could usually be observed (4 beats in 123), yet it was difficult to be certain that any diminution took place either in the size of the thyroid or in the prominence of the eyeballs. Treatment by electricity may be carried on in either of two ways. First, according to the method of Eulenburg and Guttman, who apply one electrode to the region of the sympathetic in the neck, and the other to the nape; or, second, according to the method of MM. Vigouroux and Charcot, who, in addition to applying the current to the neck, advise the application of the Faradic current to the eyelids, the goitre, and the cardiac region. Hydropathic treatment is advised by the French physicians, and although this method would certainly not suit every case, yet in some instances it might prove a valuable aid to other forms of treatment.

In the therapeutic management of exophthalmic goitre every individual case will demand the most careful consideration, but in all instances the first thing to be done is to remove the patient from the surroundings in which the disease has originated, so as to secure the greatest amount of physical and mental rest, with cheerful companions and in congenial surroundings. If the patient be very weak or nervous it will be necessary to advise absolute rest in bed for as long a time as is thought necessary, and to try, by means of nourishing, but not too stimulating, food, to promote nutrition. Only after this change of environment can any special form of treatment be expected to prove beneficial. In all cases it is well to give galvanism a trial, but in addition, belladonna in fairly large doses, with or without small doses of the tincture of digitalis, may be prescribed. If nervous excitability be very great, and sleeplessness a prominent symptom, narcotics are clearly indicated and ought not to be withheld. After improvement begins to set in, convalescence may be hastened by the administration of such tonics as quinine, strychnine, arsenic, or iron, as well as by change of air, especially to the seaside or to the mountains. In very many cases treatment conducted on lines similar to the above will be attended by good results, but in all cases the progress is necessarily slow, and the results are usually
in proportion to the care and patience with which the treat-
ment has been carried out.

In any case complications may arise which will demand
special treatment, and in some extreme cases even surgical
interference. In considering the treatment of those complica-
tions which are most frequently met with, it will be con-
venient to arrange them under the following heads:—

1. Complications relating to the Heart and Circulation.—
Cases in which the heart has become organically affected
either from the long continuance and violence of the palpita-
tion, or from other causes, are not included under this heading.
These must be treated according to rules laid down for the
management of organic disease of the heart, but apart from
organic disease, the patient's life may be endangered from
recurrent attacks of violent palpitation. Under such circum-
stances Trousseau recommended venesection, but the anæmic
and debilitated condition of the great majority of the patients
would, unless in very extreme cases where death seemed
imminent, contra-indicate such a procedure. Under such
circumstances the application of sinapisms or an ice-bag to
the praecordial region, and the free administration of ether
along with digitalis or strophanthus, the inhalation of nitrate
of amyl, and above all the use of morphine and atropine
hypodermically will, as a rule, tend to equalise the circula-
tion and regulate the nerve force; and so to cut short the
attack.

2. Complications relating to the Thyroid Gland.—It is well
known that in endemic goitre the patient's life may be
endangered from the pressure of the greatly enlarged gland
upon the trachea, or the vessels and nerves of the neck. Such
an accident, however, rarely occurs in exophthalmic goitre,
but cases have been recorded when tracheotomy, extirpation
of the isthmus of the thyroid, and even of a considerable
mass of the gland itself have had to be resorted to in order to
save the patient from suffocation.

3. Complications relating to the Eyes.—After those com-
paratively rare complications in which the patient's life is
placed in danger, the next most serious are those relating to
the eyes. Whenever any inflammation of the conjunctiva
occurs it ought to be carefully treated, and on the first
appearance of corneal ulceration the patient ought to be
confined to bed, and antiseptic treatment carried out energeti-
cally, in order, if possible, to prevent the ulcer from extending and perforating, and so causing destruction of the eyeball as an organ of vision. Unless the exophthalmos be excessive, no particular treatment is required for it; but, when the cornea and conjunctiva are becoming dry from exposure, something ought to be done to protect them from further injury. The application of some simple emollient, such as vaseline or lanoline, to the eyelids, with the use of a compress and bandage, is usually sufficient. At times, when the exophthalmos is specially marked—e.g., during violent attacks of palpitation—the application of an ice-compress often gives great relief by diminishing the burning heat and the feeling of distension within the eyeballs. In some cases, however, the prominence of the eyeballs is so great that it is necessary to perform tarsorrhaphy for the partial closure of the lids at the outer angle. Great protection is thus afforded to the eyeball; and the operation, by narrowing the palpebral fissure, does much to remove the deformity produced by the wild, staring expression of the eyes.

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THE TREATMENT OF DIPHTHERIA BY THE INJECTION OF THE ERYSIPELAS ALBUMOSE.

BY GILBERT A. BANNATYNE, M.B., C.M.,
Being his Thesis for the Degree of M.D. in the University of Glasgow.

I. Introductory Considerations.

I have for some time been vainly trying to think of some treatment of diphtheria that would give a medical man some hope of combating successfully that dreadful scourge. All methods so far have been more or less failures, but I give the following short account of the more common forms of treatment, based on Bristowe,* before describing the treatment that I would suggest should in future be carried out. In Bristowe it is recommended as a general principle that as much nourishment as possible is to be given, combined with tonic medicines. Food in a fluid form is best, and as medicine our chief standby is the tincture of the perchloride of iron. There is no reason, however, why other preparations of iron should not be used, with or without quinine. Chlorate of potash and hydrochloric acid are also recommended. Bretonneau, and afterwards Trousseau, strongly advocated the use of strong hydrochloric acid to the mucous membrane. Others, again, prefer a strong solution of nitrate of silver, or of bicarbonate of soda, or pure tincture of the perchloride of iron or creasote. Some use the following to wash out or gargle the throat—viz., chlorate of potash, thymol, chlorinated lime, carbolic acid, permanganate of potash, salicylic acid, &c. Small lumps of ice have been in many cases of use. I do not here require to refer to the local treatment of the nares or larynx, my endeavour being solely to give an outline of the more common methods of treating the disease. Emetics are said to do good in cases where asphyxia is imminent, the most useful emetics for that purpose being ipecacuanha or sulphate of copper. As a last resort we fall back on tracheotomy. This becomes necessary as soon as the symptoms of asphyxiation become marked. The mortality where it has been had recourse to is, however, very great. In my own experience 80 per cent of those operated on have died, whereas of those who were not operated on only 35 per cent died. That the disease is caused by bacilli and their products is now, I think, clearly admitted by all. The most important discoveries with

* Theory and Practice of Medicine, sixth edition, p. 218.
regard to its etiology being made by Loeffler,* and confirmed more recently by Klein.†

Taking for granted that the cause of the disease is a bacillus, the production of immunity naturally comes to be the next and most important question. This has always been looked on as not only quite possible, but quite probable, and a large number of experiments have been made with this object in view. So far, none of them have proved successful, however. Loeffler,* by his careful study of this disease, has certainly helped us greatly in the investigation, but he, like the rest, never succeeded in producing immunity, either in animal or man.

Roux and Yersin,‡ from pure cultivation of the bacilli, succeeded in isolating a soluble poison by which they were able to produce the symptoms of diphtheria varying in intensity according to the quantity of the poison injected. By boiling the poison for about the space of ten minutes they destroyed its virulence, and it therefore appeared to them to be more of the nature of a ferment than of a ptomaine.

Brieger and Frankel§ have since tried their hands at producing immunity, but they have likewise failed. They consider that the product they isolated is not a ferment, but rather of the nature of a tox-albumin (albumose), but their method would also extract any ferment present. To show that it was not a ferment they treated it at 55° C. for six hours in the presence of hydrochloric acid. I think, however, that that hardly proves their case.

From the foregoing it will be seen that numerous experimentors have tried without success to produce immunity, and I think we may safely say that so far the right means for doing so has not yet been found.

The symptoms of diphtheria, apart from the purely local symptoms, all point to the presence of some soluble animal poison circulating in the blood. What this poison is has not yet been definitely determined, but the experiments of Roux and Yerseine, and of Brieger and Frankel, all point to its probable nature. Death from diphtheria may either be caused by asphyxia, in which case the local symptoms are the more prominent, or by syncope or by asthenia, in either of which case the constitutional symptoms are the more marked. As

† Proceedings of the Royal Society, 22nd May, 1890, p. 71.
‡ Annales de l’Institute Pasteur, Nos. 11 and 12, 1888.
would be expected, where the poison is of the nature of an animal poison or product, the nervous symptoms are common and severe. The temperature is seldom high, but the heart's action is usually much interfered with, death often resulting from its failure. The nervous symptoms usually appear late on in the disease, thus pointing all the more strongly to the cause. Dilatation of the ventricles of the heart might be explained on the theory of some poisonous material acting directly on the arteries and on the cardiac muscle. An interesting explanation might also be given of the irregularity of the pulse, its action being slow in some cases and rapid in others, other conditions being apparently the same—the first case being due to irritation of the vagus, and the second to paralysis, both conditions being caused by the poison circulating in the blood of the brain. In several cases of cancerous stricture of the œsophagus, a very slow pulse has been noted owing to the direct irritation of the vagus in its course. And if thus easily in its course, how much more easily at its centre, by a poison in the blood. The presence of the animal poison is easily accounted for, as the bacilli are present in enormous numbers in the false membrane and outer layers of the mucous membrane. Their products will therefore be very readily absorbed by the congested blood-vessels and lymphatic. The presence of the bacilli in the mucous membrane of the larynx may account for the common occurrence of paralysis of that organ, as they will not only act locally, but also centrally, by their products. If further proof be needed that the disease, at least its more dangerous symptoms, is caused by a soluble animal poison, the fact that the bacilli are never found in any part of the body beyond the local lesion will, I think, be sufficient. No bacilli, for example, have ever been found in the kidney, even although that organ is most seriously affected, and showing distinct pathological signs of disease. This holds true also in the case of all the animals hitherto experimented on except in the case of the cow. Klein (loc. cit.) found in the cow that the bacilli passed into the blood, and thus into the milk.

It is a well known fact that bacteria alone will not cause the symptoms of a so-called parasitic disease, beyond the mere local symptoms, whereas the products will. Although necessary to the production of the disease, they are not the most important element in it, and the presence of any bacteria in a disease can only suggest an inquiry into the antecedent factors which have combined to bring about the disease or morbid condition favourable to the development of the bacteria. It is
quite certain that molecular death must precede all evidence of existing bacteria. Although the matter on which they thrive is found wherever dead organic matter exists, they are not able to settle in a perfectly healthy body, but are only able to develop when the physico-chemical constitution of the tissues is altered so as to correspond to their requirements. The old belief that bacteria acts injuriously by blocking up the capillaries has now been abandoned, and some new theory must be advanced to explain their action. From all that we so far know, I think that the theory of the chemical products producing the chief symptoms is the correct one. The following examples may be taken as proofs of the above statement:—

I. It has been concluded that a fluid which can retain its specific property after being filtered, boiled, evaporated to dryness, and the residue digested in cold and then in boiling alcohol, and then redissolved and again filtered, cannot owe its toxic property to any living organism.*

II. The experiments of Onimus,* who dialysed the blood, proves that the poison is not dialysable. In most cases he was able to produce symptoms of the disease before dialysis, and not afterwards, the toxic element remaining in the non-dialysable part. (This is noticed also when albuminoses form the poisonous product).

III. Burt † found that compressed oxygen destroyed all living organisms; but that the blood from a case of anthrax so treated was still virulent, proving that the cause was not a living organism.

IV. It has been shown by MM. Jaillert and Laplat † that anthrax is not a parasitic disease: that bacteria are not a cause, and the fewer bacteria present in the blood the more virulent is it. It has also been found that blood not containing any bacteria will propagate the disease.

(Three ideas have been advanced with regard to the causation of the symptoms in anthrax, viz.:—
1. That the bacilli block up the vessels and cause an embolism to form,
2. That they produce a ferment capable of decomposing the tissues,
3. And that they give rise to one or more definite poisons.
All these theories may be correct, but the last seems to be the most probable).

* Aitken, Science and Practice of Medicine, seventh edition, p. 376.
† Comptes Rendus, lxxxiv, p. 1,130, May, 1877; also Lewis's Memorial Volume.
V. Hoffa, from a pure cultivation of the anthrax bacillus, has isolated a ptomaine which, when injected subcutaneously, produced symptoms of anthrax.

VI. Pasteur* showed that the anthrax bacillus does not act by producing a ferment, for, by filtering the blood through porous cylinders, he obtained an inert fluid. He also found that the blood from an infected animal, when sterilised and injected into other animals, appeared to produce immunity.

He further found that, by subjecting the bacilli to abnormally high temperatures, or to small doses of certain poisonous substances, they lose their pathogenic properties, while their morphological and biological characters remain otherwise unaltered.

VII. Dr Sydney Martin† has succeeded in getting a proto- and a deutero-albumose from the bacilli of anthrax, and he also at the same time isolated a ptomaine. With all these he has been able to produce the symptoms of the disease.

VIII. The latest, and by far the most important discovery has, however, been made by Dr. Hankin,‡ who has isolated an albumose in the same manner as Dr. Martin. He has, however, gone further, and has succeeded in producing immunity by excessively small doses of the albumose. This discovery opens the way, I hope, to the production of immunity in many other diseases.

IX. Brieger§ has isolated four separate ptomaines from among the products of tetanus, viz.:

1. Tetanine.—This substance produces tetanus in mice when injected in small doses subcutaneously.

2. Another, not named, also causes tetanus along with a free flow of saliva and tears.

3. Tetanatoxine.—This substance first produces tremor, then paralysis, and lastly violent convulsions.

4. Spasmotoxine.—This causes severe convulsions, both tonic and clonic.

It is probable that the poison formed by the bacilli in tetanus is chiefly located either in the cord or brain, and that it does not enter into the general circulation. The flesh of animals killed by tetanus has been proved not to be poisonous.

* De l'Attenuation des Virus et de leur retour à la Virulence (Comptes Rendus, tome xci, 1881).
† Proceedings of the Royal Society, 22nd May, 1890; vol. xlviii, No. 292.
‡ British Medical Journal, p. 66, 12th July, 1890.
§ Weitere Untersuchungen über Ptomaine.
X. As mentioned before, Brieger and Frankel have isolated what they call a toxalbumin from diphtheria, tetanus, cholera, and typhoid fever cultivations.

XI. Roux and Yersin, as was also mentioned before, have isolated a soluble poison from diphtheritic cultures.

XII. The virus of rabies is still unknown, although the virus has been artificially attenuated by Pasteur,* and he has thus succeeded in producing immunity. He thinks the virus is a soluble chemical substance formed by an unknown microbe.

XIII. Professor A. Babés† has informed Dr. Hankin that he has just isolated an albumose from the central nervous system of animals dead of rabies.

XIV. Since the above was written, Dr. E. A. v. Schwenitz‡ has given some preliminary notes of a study of the products of hog cholera. He also isolated a salt which he says is cadaverine, and also a primary amine which he has not yet identified. He has also obtained an albumose which gives rise to well marked symptoms. He has been able to produce immunity by means of certain chemical compounds which, however, he does not reveal.

XV. Selander§ also gives his results with regard to hog cholera. Death, he says, is due to poisoning, as when virulent filtered blood is injected into the veins of a healthy animal, the animal dies rapidly, with symptoms of paralysis, which occur in a definite and regular order. The poison, when the animal recovers, is excreted by the kidneys. The poison is not destroyed at 58° C., but it loses its power at 100° C., and retains only part of it at 60° C. He states that it is not an alkaloid, but a toxic albumen, which has a cumulative action. He was fairly successful in some experiments he made to produce immunity, but not entirely so.

From the above facts it is argued that the cause of death is poisoning by these products, and that the bacteria are not merely the means of spreading infection, but are also actually the makers of it. On such principles rests the protective inoculation by chemical substances. By introducing, little by little, these chemical substances, produced by pathogenic bacteria, into the bodies of animals in such a way as to avoid speedy poisoning, but so as gradually to accustom the animal

† British Medical Journal, p. 67, 12th July, 1890.
‡ Medical News, 6th September, 1890.
§ Annales de l'Institute Pasteur, p. 545, No. 9, tome iv, 25th September, 1890.
to its presence; it becomes refractory not only to toxic doses, which would at first have caused death, but also to the microorganisms themselves. And now the immunity, which hitherto we could only produce by introducing a living virus into the body, is effected by introducing a chemical substance, and these inoculable substances being those that we have observed caused the poisoning. The question now comes to be, has the animal become refractory in consequence of the presence of these substances in its tissues thus preventing the growth of the bacteria? Upon this point we know that, as the products of growth accumulate in certain tube cultivations of bacteria, so do its powers of growth lessen, until finally they cease entirely. We must, however, be careful to avoid, as yet, forming an opinion as to what happens in the human body. If we take a little blood from a sheep rendered immune to anthrax, and inoculate it with anthrax bacilli, they will grow; thus showing that the blood contains no substance capable of destroying the life of the bacilli.

Bouchard * on this point says that after eliminating one by one the different possibilities as to how the chemical action of a few cubic centimeters of injection acts, he finally considers that the products of a microbe act by diminishing the power of the cells to act as phagocytes. A microbe is then apparently pathogenic if it can produce a poison capable of paralysing the leucocytes. If the leucocytes have acquired tolerance against this paralysing agent, the animal has acquired immunity against the microbe.

The two products that I have here mentioned as being produced by bacteria are alkaloids or ptomaines, and poisonous proteids or albumoses.

The present state of our knowledge with regard to these substances is still very elementary, but the following few facts may be of interest:—

The ptomaines or animal alkaloids were first discovered by Panum in dead animal tissues produced by putrefactive decomposition. Since then a large number of discoveries have been made with regard to them by a number of workers, but more especially by Brieger. He has studied them very closely, and has done more than any one else to forward our knowledge of them. They have been found to resemble very closely the known vegetable alkaloids.

Dr. Lauder Brunton † writes of them “as products of albuminous decomposition, whether their albuminous precursor

† Pharmacology and Therapeutics, third edition, p. 100.
be contained in the cells of plants and altered during the process of growth, or whether the albuminous substances undergo decomposition outside or inside the animal body, or by processes of digestion as by unorganised ferments."

They are crystalisable bodies, consisting of nitrogenous bases. They have been discovered in nearly all bacterial cultivations, but so far no one has successfully induced immunity by their means. When injected into the bodies of animals they give rise to the well known symptoms of alkaloid poisoning.

Albumoses or poisonous proteids. Little is known about this class of product, but the little that is known shows that they are of a very powerful class in their action. Hankin mentions "that the only cases of tolerance which resemble the tolerance implied in disease immunity are those of tolerance against albumoses." Immunity against a disease produced by a micro-organism suggests the fact that immunity against the disease is also immunity against an albumose. That immunity can be produced by this class of product has already been proved by Hankin, and taking everything into consideration, I think we must look to this class for our means of treating and of producing immunity against the so-called parasitic diseases.

The poisonous proteids give all the reaction of the proteids found during digestion.

II. THE TREATMENT OF DIPHTHERIA.

I will now turn more particularly to the treatment and producing of immunity against diphtheria. Considering the failures of so many in the treatment of this disease, I was much pleased to see a report in the Lancet† of some cases successfully treated by Dr. Babchinski of Kieff, by the inoculation of the erysipelas virus. Dr. Babchinski‡ had his attention first drawn to this mode of treatment by his son, who was suffering from gangrenous diphtheria that had extended to the nares. The irritation caused by this made the lad scratch himself until he produced ulceration. This was followed by erysipelas, and the boy at once appeared to improve, and was shortly out of danger and well. Following this up, he began inoculating patients suffering from diphtheria with the erysipelas virus, and he was rewarded

* British Medical Journal, p. 65, 12th July, 1890.
† Lancet, p. 922, vol. i, 1890.
‡ Internationale Klinische Rundschau, May, 1890.
with most satisfactory results. He injected the virus into the patient's submaxillary region.

After thinking the above over, I came to the conclusion that I had at last got a clue to the treatment of diphtheria. As holding out still more hope that I might prove to be right was the fact that erysipelas has been used for ages as a curative agent in various affections, but more especially of malignant disease of the external surfaces. It seems first to have been employed in the seventeenth century, and amongst other early observers was Hebra. He expressed great faith in its use for tumours. Ricord and Després* appear to have used it largely in the treatment of phagedenic chancres. Busch† also employed it in malignant new formations of the lymphatic glands. Fehleisen,‡ who was the first to isolate successfully the micrococcus, records seven cases in which he treated, with more or less success for the time being, malignant disease. He also mentions the following as examples of what it was supposed to do good to—viz., mental diseases, neuralgia, typhus, acute rheumatism, chronic joint affections, syphilis, keloid, epithelioma, carcinoma, and enlargement of the lymphatics.

In the cases treated by Fehleisen, he injected pure cultivations of the micrococcus, and in every case he succeeded in producing erysipelas. The period of incubation varied from 16 to 60 hours. In no case did any evil result to the patient from the induction of the disease. He also found that after the patients had once suffered from the disease that they were immune from a further attack for a short period. This immunity does not appear to be lasting like that of many other infectious diseases—in fact, it would appear as if repeated attacks of erysipelas actually predisposed patients after a certain time to other attacks. This is supported by observations made in a large general hospital, where the larger proportion of idiopathic attacks were either second, or even third or fourth attacks. Although the inoculation with the erysipelas virus may be effective in treating diphtheria, it is open to many objections, and it has occurred to me that it would be much better, if possible, to do so by the products of the erysipelas micrococcus. In that case you would only inject a known quantity, and could thus regulate its strength.

† W. Busch, Berlin Klin. Wochenschrift, 1866.
‡ Loc. cit. supra.
and result. You, would not only run less danger than must always be present in injecting living organisms into the human system, but would also avoid in all probability any chance of setting up local mischief. I may here mention the fact mentioned by Bouchard,* that many observers have succeeded in protecting an animal against a microbe by inoculating it with another. More than half a dozen different species protect against anthrax, and if against anthrax, why not against diphtheria?

I shall now give some details of my experiments carried out with the production of immunity or treatment of diphtheria, being the end always kept in view.

In the following experiments the Klebs-Loeffler No. 2 bacillus† was entirely used. It was obtained from a small piece of diphtheritic membrane embedded in blood serum. From among the numerous bacterial growths resulting, No. 2 bacillus was isolated, and proved to be the diphtheritic bacillus by control inoculations of guinea-pigs. The colonies growing on the nutrient jelly were round or oval in shape, dark-brown or greyish-yellow in colour, according to their situation. On closer examination they were seen to be coarsely granular, and had irregular outlines. When injected into guinea-pigs, a whitish or hemorrhagic exudation occurred at the spot of inoculation, rapidly followed by subcutaneous oedema and death. After death, large quantities of bacilli were found in the local lesion, and were readily isolated and cultivated in nutrient jelly. In no case were any bacilli found in the internal organs, although these were greatly congested. The principal organs affected were the lungs, intestines, and kidneys.

The bacilli, when examined under the microscope, were found to be immobile. Their length corresponded closely to that of a tubercle bacillus, but they were thicker. They may vary very considerably in length. The best stain to use is methylene blue.

The erysipelas micrococi were obtained by embedding a small piece of skin taken from a case of erysipelas in man. It was placed in a gelatine medium while in a fluid state. In about 24 to 36 hours, when the tube was kept at 20° C., small colonies appeared near the piece of skin. By subsequent inoculation of other tubes a pure cultivation was got. The organisms were found to grow in chains, and were easily stained by Gram's method. On coagulated blood serum it

* Action des Produits Secrétés par les Microbes Pathogène.
† Mitth. aus dem K. Gesundheitsamt, Band ii.
grows very well, at the temperature of the body, as a white layer, easily removed from the surface. When inoculated on rabbits very characteristic results were got. The site of the inoculation, as recommended by Fehleisen,* was the ear. After 36 to 48 hours, a sharply defined reddening appeared, and spread from the seat of inoculation, especially along the blood-vessels, to the root of the ear and neck. The disease, after the space of a day or two, waned, and finally disappeared. I also obtained similar results in the case of guinea-pigs, except that perhaps the course of the disease was not quite so well seen.

In the first series of experiments I inoculated the microorganisms of both diseases simultaneously, and in only one case did death ensue. In all, ten guinea-pigs were so treated.

Series I.—Animal, guinea-pig. (Both micro-organisms injected together.)

No. 1.—At the point of inoculation, after about 36 hours, the subcutaneous tissues were seen to have become edematous, and a small tumour occurred with the formation of a false membrane. Shortly after, the surrounding skin was seen to be much reddened, and this appearance gradually extended in all directions. At the same time severe constitutional disturbances were noticed. The temperature rose 1° to 2° C., the animal was restless, it constantly moved about, and did not sleep. It refused all food, but drank readily; the respiration was hurried. In about 36 hours more the severity of the disease had passed, and the animal gradually recovered its normal appearance, with only slight sloughing of the tissues at the seat of inoculation.

Nos. 2, 3, 4, and 5 all followed a more or less similar course, and all ultimately came round.

No. 6.—For some reason which I could not explain, this case ended fatally. From the appearances at the seat of inoculation, it seemed as if the erysipelas virus had not taken effect, and on making cultivations from the tissues only the diphtheritic bacillus was got.

Nos. 7, 8, and 9 ran a course similar to No. 1.

No. 10.—In this case the amount of erysipelas virus was in much greater proportion than the diphtheritic, and the disease ran a much milder course than in any of the other cases.

No. 11.—Control for diphtheritic virus.

No. 12.—For erysipelas.

From this series it will be seen that Dr. Babelienski's view

* Fehleisen, loc. cit.
is upheld, and it becomes clear that the virus of erysipelas can prevent a fatal termination in diphtheria. Whether immunity can be produced by these means has yet to be worked out. I now began my search for the chemical products, by means of which I hoped to effect as much as the virus itself did without many of the latter's evil effects. I first, then, tried to isolate a ptomaine from pure cultivations of the erysipelas micrococci.

The method employed was as follows:—The cultivation was first turned out of the tube into a porcelain capsule, which was gently heated, until it was evaporated to dryness, and remained as a brownish deposit at the bottom of the capsule. I then extracted, with successive small quantities of alcohol, to remove various insoluble salts, and I then removed the sulphates, phosphates, &c., by precipitating with an alcoholic solution of the neutral acetate of lead. After filtration, the remaining alcoholic solution was then precipitated with a warm alcoholic solution of mercuric chloride. By these means most of the organic bases present were thrown down in the form of insoluble mercuric compounds. Some, however, as a rule, always remained in solution. Both precipitate and filtrate were kept and treated separately. They were freed from the mercury by heating, at the same time driving off the alcohol. The remaining solution could now be tested with liquor potassae to show the absence of any mercury. It is now rendered strongly alkaline by the addition of a 10 per cent solution of caustic soda, and then treated with either benzoyl chloride, gold chloride, or platinum chloride. By these means I succeeded in isolating a compound from the pure cultivations that answered in all respects to the characters of a ptomaine. To obtain the alkaloid pure, I treated the double benzoyl compound with alcohol, in which it was freely soluble. It was insoluble in water, and crystallised out of alcohol in long fine needles arranged in feathery bunches. Its melting point was found to be between 170° and 173° C. It gave reactions with potassio-mercuric-iodide, phospho-molybdic acid, and phospho-tungstic acid.

When injected into rabbits it gave rise to general uneasiness, a rise in temperature, refusal of food, vomiting, purging, salivation, dyspnœa, paralysis, and death, according to the quantity injected.

I was not in any case able to produce immunity by it from erysipelas, and it appeared also to be useless in the treatment of diphtheria.

I now turned my attention to the poisonous proteids, and
my search for an albumose was conducted as follows:—The cultures of the erysipelas micrococcus were made in a 0·1 per cent solution of Liebég's extract of meat, to which some fibrin was added. The Liebég's extract was sterilised by heating for several consecutive days in a steam steriliser for two or three hours daily. The fibrin was added after this, and the whole resterilised by repeatedly heating to the boiling point for a short time on each occasion. After inoculating with the micrococci from a pure cultivation, the tube is kept at the ordinary temperature for ten days or so. The liquid is then filtered and the albumose extracted. At first I employed NaCl as the reagent for extracting the albumose, but I finally got better results with (NH₄)₂ SO₄. After filtering, the cultivation fluid is rendered acid with acetic acid, and saturated with (NH₄)₂ SO₄. A bulky white precipitate formed, which was filtered off, and the salt separated by dialysis. The best means to prevent putrefaction at this stage is to carry on the process over running water at a temperature of 48° C. After dialysing for 24 to 48 hours, the albumose will be found in solution with a considerable quantity of water, which has passed through the parchment. The next thing to do is to concentrate the solution by evaporating it "in vacuo" over sulphuric acid. When evaporated to a sufficiently small amount, it is poured into absolute alcohol, washed in the same reagent and dried. I now had a substance that gave all the reactions of the albumoses formed in peptic digestion. When injected into animals, it was found to produce local subcutaneous œdema, with some sluggishness, leading to prolonged stupor, coma, and death, according to the dose. At the same time there was, especially at first, great increase in the temperature, the pulse became full and bounding, and the respiration much hurried. This was followed by a slowing of the pulse, and loss of body heat as the comatose condition supervened. A fatal dose in guinea-pigs was found to be about 0·014 gram per 1 gram body weight of the animal. To free the solution of albumose from any ferments that might be present, the solution was mixed with a quantity of lime water and a solution of phosphoric acid added. By this means a gelatinous precipitate formed of calcium phosphate. The precipitate being filtered off, a clear solution of the albumose remained—any ferment present being carried off with the precipitate. (The above method is almost identical with, and was founded on, that of Hankin.*)

Now, having obtained an albumose, I carried out some

* Hankin, British Medical Journal, p. 66, 12th July, 1890.
experiments to see if it were possible to produce immunity against erysipelas. I was only able to do so on five rabbits, however, and my results cannot therefore be in any way conclusive.

**Series II.** — *Animal, rabbit.* (Dose of albumose varied from $\frac{1}{1000}$ to $\frac{1}{5000}$.) The injections were made in the animal's ear after having first shaved and then thoroughly cleansed and disinfected the surrounding skin. The syringe used was one of Koch's, which was sterilised between each injection.

No. 1. — In this case the albumose was injected along with the micrococci.

No. 2. — Here it was injected 24 hours before.

No. 3. — Here 48 hours before; and in

No. 4. — 72 hours before.

No. 5 was a control animal for the micrococci.

In Nos. 1 to 4 perfect immunity was obtained with the above doses given once. In No. 5 a typical case of erysipelas developed.

**Series III.** — *Animal, guinea-pig.* (Diphtheritic virus injected 24 hours after the erysipelas albumose.) The injections were made in the animal's side or neck after having taken every precaution against outside infection.

No. 1. — Control animal for the diphtheritic virus—died.

Nos. 2 and 3. — Dose of albumose $\frac{1}{500}$ of the body weight of the animal. In both these cases there were local signs of an irritating substance having been injected, but no signs nor symptoms to show that it was caused by the virus of diphtheria. About 3 hours after the injection of the albumose slight rise in temperature occurred, with a small swelling at the point of injection. This, in about 12 hours, had reached the size of a half walnut, and the temperature had risen 2$^\circ$ C. The temperature and swelling now gradually fell, until it was nearly normal in about 24 hours. Now the diphtheritic virus was injected, and almost immediately the swelling became greatly increased, and the temperature rose until it reached 3$^\circ$ C. above normal. The animal appeared to be in considerable pain, and was very uneasy. This state continued for about 12 hours, when it gradually subsided, leaving the animal weak and much prostrated.

Nos. 4 and 5 were equally protected from the diphtheritic virus, the symptoms following a similar course to that just described.
SERIES IV.—Animal, guinea-pig. (Albumose injected 7 days before virus.) In this series the dose at first was \( \frac{1}{4000} \), repeated when all signs of reaction had ceased. This was usually on the second day.

No. 1.—Control—died.

No. 2 was immune. After all local action following the injection of the albumose had disappeared, the animal appeared to be quite well until the second dose was given. This was followed by a second and shorter reaction. On injecting the diphtheritic virus, there was, within 6 hours, slight local heat and swelling with a rise of 1° C. of temperature, but it never went beyond this, and had none of the violent effects produced in the first series of experiments.

No. 3.—Only one dose given in this case. Animal contracted slight amount of diphtheria, but recovered well.

No. 4.—Dose repeated twice in this case. Animal quite immune beyond slight local symptoms.

No. 5.—Slight local signs. Two doses of albumose given.

SERIES V.—Animal, guinea-pig. (Albumose injected 24 hours after virus.)

No. 1.—Twenty-four hours after the injection of the diphtheritic virus considerable local swelling was noticed, as well as slight general symptoms. In this case \( \frac{1}{4000} \) of albumose was given. This was followed almost at once by severe reaction. There was great increase in temperature and local swelling. These in about 24 hours had subsided somewhat, so another dose of \( \frac{1}{4000} \) was given, and by this time the animal had apparently got over the worst of the disease. It finally recovered, but not for nearly a week.

No. 3.—The dose in the first instance was \( \frac{1}{4000} \), and the reaction was very severe, but it stopped all diphtheritic action, and, although another dose of \( \frac{1}{3000} \) was given, it was not required.

No. 4.—Dose increased to \( \frac{1}{1000} \). In this case a large slough formed at the point of inoculation.

No. 5.—Dose \( \frac{1}{300} \). In both these two cases the reaction was most severe, and the animals appeared as if they would succumb, but they both rallied, and certainly all traces of the diphtheria disappeared rapidly.

SERIES VI.—Animal, guinea-pig. (Albumose injected 48 hours after virus.)

No. 1.—Control—died.

Nos. 2 and 3.—In these cases the diphtheritic virus had
time to have full effect on the animals before the albumose was injected. In both cases they were nearly moribund, and on the albumose being injected a severe reaction occurred, and it was only by stimulation and injections of ether that the animal was kept in life until the reaction subsided. Then the diphtheritic action was found to have been checked, and the false membrane, which had occurred at the seat of injection, was found to have become loosened, and was easily detached, and the surface underneath was looking more healthy. The animals were weak, but the temperature had fallen nearly 2° C. to normal. They also showed some desire to take some food. The second dose was given in about 24 hours, and was found to have little or no effect.

No. 4.—Shortly after the first dose of \(\gamma_{\frac{1}{100}}\) was given, the animal died apparently from diphtheria.

No. 5.—Animal was very ill before the injection, so that this was increased to \(\gamma_{\frac{1}{10}}\). Next morning, after a very severe reaction, animal was better, and got another dose of \(\gamma_{\frac{1}{20}}\). It steadily improved, and when on the third morning \(\gamma_{\frac{1}{10}}\) was injected there was no reaction. In this series of cases the animals were all very ill before the albumose was injected, and in all the reactions were severe and prolonged.

The conclusions I drew from the above experiments were—
"Firstly. That even although the diphtheria had a good hold of the animal's system, yet by injecting the erysipelas albumose it could be arrested. This was true, either where the symptoms were only beginning to show themselves, as well as where they were well marked and severe. The albumose acted apparently by killing the bacilli—at least it rendered the surrounding ground unsuitable to their development, and thus prevented their elaboration of chemical poisons.

"Secondly. It produces immunity, of how long duration I cannot say, as far more elaborate experiments are required to determine this point.

"Thirdly. The dose varies from a \(\gamma_{\frac{1}{10}}\) to a \(\gamma_{\frac{1}{100}}\). If one dose is not sufficient, and in a few cases it will be sufficient, a second should be given slightly larger than the first, and so on, until no reaction is got after the injection. The first dose, I hold, should not be more than a \(\gamma_{\frac{1}{100}}\) at most.

I do not pretend that these experiments are conclusive, or nearly conclusive, but I hold that they carry out the theory, on which I was working, which was, that diphtheria being a parasitic disease, was curable by the death of the microbe
causing it, and by administering the antidote to the poisons produced by it (the microbe). This cannot so far be done by the chemical poisons of the diphtheritic bacillus itself, but the body may be rendered unsuitable to its development by the action of the erysipelas virus or products, just as an animal is rendered immune to anthrax by the bacillus prodigiosus or its products. These facts, I think, render the subject just treated well worthy of further study.

CURRENT TOPICS.

GLASGOW ROYAL INFIRMARY.—At the meeting of managers held on 3rd August last Dr. John Dougall was elected Physician, and Dr. Alexander Morton Physician for Diseases of the Skin. Dr. William Macewen was re-elected surgeon, and the other members of the staff were re-elected. During the month of August the following offices were announced to be vacant—viz., those of Assistant Physician, Assistant Surgeon, Aural Surgeon, and Dental Surgeon. Miss Wood, the Matron of the Infirmary, has also resigned, and the managers are engaged in considering the claims of a large number of candidates for this very important post.

THE RECENT MILK POISONING CASE IN THE WEST END OF GLASGOW.—This was a case in which serious symptoms of acute poisoning were thought to have been caused in a number of individuals, chiefly children, by partaking of milk from a recently calved cow. An action was raised by the dairyman against the farmer for supplying the injurious milk, and it has been decided by the Sheriff in favour of the defendant, mainly on the ground that the evidence adduced was not sufficient to prove that the illness of the affected individuals was due to the milk supplied by the defender to the pursuer. We have no right and no desire to discuss the legal points as to the value of the evidence brought before the court, but we very decidedly agree with Dr. Russell in thinking that milk from a recently calved cow, which is said to have been fevered by a difficult calving, should not be used as food, and that such milk is likely to prove injurious to those partaking of it. It so happens that we saw, in consultation with Dr. Wright, one of the affected children, and the
symptoms were so suggestive of acute irritant poisoning that we carefully considered every possible source of such an accident. Besides the milk which had been used in the morning, the only thing which the child had taken was a rice biscuit, purchased at a neighbouring baker's shop in the forenoon. We procured one of the biscuits and had it tested for arsenic, with negative results. The child recovered all right, and we learned no more of the case until it was raised in the Sheriff's Court, and reported in the daily press. The whole incident is just another proof of the great ease with which disease may be spread by means of the milk supply, and also of the difficulty there often is of adducing evidence sufficient to convince a court of law on such a matter. The full discussion, which this case has had in the daily papers, will have served a very useful purpose if it assists in impressing this important fact more forcibly upon the public mind.

British Institute of Preventive Medicine.—As we announced last month, the President of the Board of Trade has now granted the licence necessary to register this Institute as a limited liability company, with the omission of the word "limited." Sir M. Hicks-Beach has made it clear, however, that this does not express any approval on his part of experiment on living animals, and that the Board of Trade does not seek in any way to affect the discretionary powers of the Secretary of State in the matter of granting a vivisection licence to the Institute. This decision must be somewhat of a disappointment to our well-meaning friends, the anti-vivisectionists, who have lately been sending us strongly worded pamphlets with titles like the following:—"A Foretaste of the Institute of Preventive Medicine;" "An Institute of Preventive Medicine at Work in France;" "The Significance of Vivisection," &c. We have no doubt that all, who can show that they are capable of undertaking research work in the new Institute, will have no difficulty in procuring vivisection licences if they desire them; and we feel sure that the Institute will prove of great service both to science and humanity. The following gentlemen have agreed to serve on the Council:—Sir Joseph Lister, chairman; Sir Charles A. Cameron, Mr. Watson Cheyne, Professor Michael Foster, Professor Greenfield, Professor Victor Horsley, Sir William Roberts, Sir Henry Roscoe, Professor Roy, Professor Burdon Sanderson, Dr. Pye Smith. Dr. Armand Ruffer, of 19 Iddesleigh Mansions, Westminster, S.W., will act as honorary secretary till the first meeting of the Council.
THE SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.—Undoubtedly the most important scientific event of last month was the meeting of this Congress in London. Full details of the meetings and discussions have been published in the daily newspapers and in the weekly medical press; and, judging from the opinions expressed by the latter, the gathering was in some respects a great success, in others "little short of a failure." It seems that in many ways the executive department was very badly managed, a circumstance to be wondered at when the gentlemen entrusted with the duty of preparing for the meeting had the experience of the London and Berlin International Medical Congress organisers to go upon. Be this as it may, however, there can be no doubt that a great deal of very valuable and important scientific work was accomplished. Probably to medical men the chief interest attaches to the discussions which took place in the Sections of Bacteriology, and of the Relations of the Diseases of Animals to those of Man. In the former, the discussion on immunity gave evidence of the great advance our knowledge of infectious diseases has made within the last decade, and was full of suggestions for new lines of research. In connection with this section the names of Roux, Buchner, Hankin, and Metchnikoff will always be remembered on account of their epoch-making contributions to our knowledge of this very obscure and difficult subject. The Congress has afforded much material for careful study, experiment, and reflection to medical men, sanitarians, and pathologists of all nationalities and of all shades of scientific opinion.

THE EDINBURGH SCHOOL OF COOKERY AND DOMESTIC ECONOMY, LIMITED.—We have received from Miss Guthrie Wright, honorary secretary, the prospectus and programme of this Association, which we have much pleasure in bringing under the notice of our readers as a very important health agency. For sixteen years the School has taught cookery in all its branches—sick-room and others. Lectures on sick nursing have been given in many towns, and classes have been annually held for medical students, infirmary nurses, and Queen's nurses. The scheme is now to be somewhat extended, the novelties being a special curriculum for the "Housewife's Diploma," the foundation of a boarding-house for lady students coming from the country, and the institution of evening technical classes for domestic servants and women and girls of the working classes at a low fee. The idea seems to be a good one, and the notion of training girls to be good house-
wives is worthy of all praise. Whether the holding of a diploma in housewifery will increase a girl's chance of marriage we cannot say; but there can be no doubt that thorough acquaintance with the subjects included in this course of training, as set forth in the prospectus, should conduce materially to the husband's and children's comfort. The capital of the company consists of £4,000, in 800 shares of £5 each; and, of the present issue of 600 shares, 439 have already been taken up. The School has received the approval and patronage of a large number of well known ladies and gentlemen, and any information with regard to it may be obtained from Miss Guthrie Wright, 2 Lansdowne Crescent, Edinburgh.

American Orthopedic Association.—We have received the programme of the fifth annual meeting of this Association, which will be held from 22nd to 25th September, 1891, in the new Reception Room of the Arlington Hotel, Washington, D.C. In all, 67 communications have been promised; and, in addition to the American physicians and surgeons, we observe the names of gentlemen from London, Liverpool, Manchester, Würzburg, Paris, and Berlin. The meeting promises to be a very successful one, and the programme gives evidence of the energy and zeal of our American confrères. The following are the office-bearers:—President, A. B. Judson, M.D. Vice-Presidents, Ap Morgan Vance, M.D., and George W. Ryan, M.D. Corresponding Secretary, Samuel Ketch, M.D. Secretary and Treasurer, John Ridlon, M.D., 337 W. 57th Street, New York. Committee on Membership, E. H. Bradford, M.D.; Arthur J. Gillette, M.D.; Samuel Ketch, M.D.; Benjamin Lee, M.D.; L. A. Weigel, M.D.

Ruprecht's International Medical Bibliography.—It gives us pleasure to announce to our readers that an English edition of this useful publication is to be issued by Messrs. Luzac & Co., 46 Great Russell Street, London, W.C. The publication will appear quarterly, and the subscription price is 6s. per annum.

Messrs. Burroughs, Wellcome & Co. have sent us a sample of their tabloids of compressed bi-sulphate of quinine. The tabloids are readily dissolved in water, a great advantage, and we are sure that this very handy mode of administering quinine will recommend itself to the profession.
REVIEWS.

_Cyclopaedia of the Diseases of Children, Medical and Surgical._

The last volume of this great _Cyclopaedia_ is concerned with the Ear, the Eye, Hygiene, and Diseases of the Nervous System.

Dr. Charles H. Burnett, Philadelphia, is the author of the article on the Diseases of the Ear, and within the moderate compass of 50 pages he has described the various affections of this kind incident to childhood. The importance of many of these is becoming more and more recognised, especially since attention has been directed to the causative relation between purulent discharges from the ear and meningitis and cerebral abscess. The recognition and the treatment of such affections are fully discussed, and due attention is also paid to the causes of deaf-mutism and its prevention. Were students presenting themselves for their final examination made to adduce evidence of having received instruction in aural disease, Dr. Burnett and others would have less reason to animadvert on cases of deaf-mutism and cerebral mischief resulting from errors in the diagnosis, and in the treatment of ear disease in early life.

The space devoted to the eye, almost 200 pages, will show that this subject has also received ample treatment. The articles are by three writers. Affections of the Eyelids, Lachrymal Apparatus, Conjunctivæ, and Cornea are discussed by Dr. George E. de Schweinitz, Philadelphia; Diseases of the Eye by Dr. Charles S. Turnbull, Philadelphia; and Ophthalmoscopy, Local Diseases and Functional Disorders of the Choroid, Optic Nerve, and Retina by Dr. Charles A. Oliver, also of Philadelphia. The last of these is the one that is of most interest to the physician, going over, as it does, the ground covered by Gowers in his _Medical Ophthalmoscopy_. It is an exceedingly complete article, bristling with references to various publications, and full of information. It is but right to add that all these articles are well illustrated.

Part III, Hygiene, presents us with a somewhat diverse series of articles. The first, on Physical Development, is by the Editor and Dr. James K. Young, the orthopaedic surgeon
of the University Hospital, Philadelphia. Commencing with a description of the measurements of the finest ancient models of the human figure, they proceed to apply the proper methods of measurement to children at various ages, giving the results as obtained by Roberts and others. These are of value, as indicating the standard with which individual cases may be compared. It is only, however, in public schools and in institutions for the reception of children that the desired information, as shown in the various tables and schedules, is likely to be obtained. They then discuss the effects of exercise, and many interesting pages are devoted to animal mechanics, which are illustrated by various photographs from the admirable series taken by Professor Muybridge, whose work has thrown so much light on this subject. Among other interesting information on the subject of physical training, they give a sketch of the method that obtains in the gymnasium of the Harvard University, than which nothing could be more complete or better adapted to determine the physical state of the individual, and the lines on which exercises should be prescribed. The Swedish system of gymnastics is also fully described, and the description is rendered clear by numerous illustrations. In the section on exercise in infancy there is a statement made, however, which surely requires some qualification. On page 282 we read that "if born in the latter part of autumn, infants cannot with safety be taken out before the return of spring; but, if the apartments are large and airy, little evil will result from this prolonged confinement." We do not know what the practice is in America, but we do know that no medical man in this country, who knows the benefits derived from exercise in the open air, and the evil effects of confinement upon young infants, would, even in this uncertain climate, act up to the advice here quoted. Perhaps the rigors of the winter in some parts of the American continent may make such confinement a necessary evil, but it surely cannot be the case in Philadelphia, where the authors reside; and, at any rate, in a work intended for the whole English-speaking race, an unqualified statement of that sort is a serious overlook.

Massage is shortly disposed of, and a chapter on the Prophylaxis of Disease in Children again brings before us, in brief form, the subject of bacteria in the causation of disease.

A full article on School Hygiene, by Dr. D. F. Lincoln, Boston, treats, among other things, of the influence of school-life on chorea and other nervous affections, consumption,
backache, deformity of the spine; of desks and seats; of
defective sight; of physical training; and of the ventilation
and drainage of school-houses.

Mr. Lindley Johnson, architect, Philadelphia, writes an
instructive article on the Construction of Children's Hospitals,
with various plans.

Juvenile Crime, and Public Methods of Prevention and
Reclamation, a subject that might readily have been over-
looked in a medical cyclopædia, has been entrusted to the pen
of a lawyer, Mr. J. Percy Keating, who gives the legal aspects
of the question, and much information of interest as to the
manner in which juvenile criminals are treated in some States
of the Union.

The Methods of Examining Children Orally in Medico-Legal
Cases, and the Physical Examination of Children in Cases of
Assault, by Dr. Jerome Walker, complete the part devoted to
Hygiene.

The remainder of this volume, more than six hundred pages,
is occupied with the important subject of the Diseases of the
Nervous System, the various affections of which are described
in twenty-eight articles by more than twenty different writers.
That diseases of the nervous system are common in American
practice is generally understood to be the fact; and hence we
find in this list the names of many authors whose work in
this department is already well known—e.g., McLane Hamilton,
A. Jacobi, Mary Putnam Jacobi, Sachs, Starr, Dana, Sarah
McNutt, Lewis, Gray, and Mills. It is impossible to deal
critically with the mass of material which they have laid
before us. Suffice it to say that the ground is well covered,
there being articles not only on the various forms of meningitis
of the brain and cord, on the varieties of sclerosis generally
recognised, chorea, epilepsy, and such like, but also on the
rarer forms of cerebral palsies, in the elucidation of which so
much work has been done in America, on toxic affections, on
diseases of the peripheral nervous system, on headache,
hysteria, disorders of sleep, idiocy, and insanity. Like other
sections of the work, this is illustrated, but we could have
wished that the woodcuts and photographs had been more
numerous.

In concluding our remarks on this Cyclopædia, we cannot
but express the high opinion we have formed of the work as
a whole. The undertaking was a large one—the work of the
editor must have been great; but he secured the assistance of
a large number of eminent writers, and he is heartily to be
congratulated on the successful issue of his labours. While
this *Cyclopedia* is too large for general or daily use, it is not a work which it would be superfluous for a general practitioner to possess. There are many occasions on which he would find it of great service to him, and the capital index with which each volume is furnished renders reference to it a comparatively easy matter. We therefore commend it most heartily to our readers.

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The pathology and the treatment of gout are subjects which have occupied the pens and the thoughts of a great multitude of authors, and the present treatise is a large and important contribution to the already voluminous literature. The subject has always been a favourite one with the west end physicians of the Metropolis, and Sir Dyce Duckworth in many ways is well qualified to expound both his own and the views of others on the diverse manifestations of gout. Chapter I is entitled "Definition of Gout," and we think the author wise when he says "that no brief or trite definition of this malady will suffice to explain its varied characters. A fitting conception of it now demands, with increasing knowledge, a comprehensive survey of a very large field of pathological processes." In fact, it seems to us that many writers on gout have in their speculations ranged over the whole field of the practice of medicine, and from this no doubt has originated the taunt, deprecated by the author, of seeing "gout" everywhere. On going through his book we are sometimes tempted to think that if Sir Dyce Duckworth does not see "gout" everywhere, he at least sees it in a good many places where an ordinary practitioner might not think of it.

After a very good chapter on the "Pathological Doctrines Concerning Gout," the "Pathogeny of Gout." is discussed at great length, in an article full of interesting matter, but not always convincing as to the accuracy of the views propounded. The chapter is philosophic and speculative rather than scientific and convincing; and after reading it through we rise from the task with a confused sense of having dipped into some of the humoural and solidistic controversies of Cullen and his contemporaries. Here are two sentences which give with sufficient accuracy and conciseness the gist of the author's ideas with regard to the pathology of gout:—"I stand firmly by the position that gout owns a nervous as well as a humoral pathogeny. . . . For my part, I cannot dissever the two ideas, and hence I affirm that gout is a neuro-humoral disease."
Reviews.

We feel very much inclined to ask what meaning such statements are likely to have to the younger practitioners of to-day. In our opinion, none. The days of such affirmations are long past and gone, and the sooner we are able to base our doctrines of disease upon the ascertained facts of pathological anatomy, the sooner will we be able altogether to discard such vague and theoretical statements. At one time the author conjectured that the special portion of the nervous system involved in gout was some part of the medulla oblongata, but the criticism of the eminent Parisian professor has led him to cease insisting upon this part of his theory. We think rightly so, for no part of the whole chapter strikes us as being weaker than that of the analogy instituted between locomotor ataxia and gout as regards the question of nervous localisation. In this connection a sentence from page 97 is of interest:—“In respect of the nervous system, it may be affirmed that there is, as yet, no morbid anatomy in the gouty.” When we can, in the case of gout, demonstrate nervous lesions so striking and palpable as those present in locomotor ataxy, we may then attempt to institute an analogy between them. The whole of this very interesting chapter strikes us as being somewhat behind the age, and we confess to being more convinced by the half page devoted to the “mere physical theory of gout, such as is now much held in Germany,” than by the 34 pages of argument and affirmation, which precede it, in favour of the so-called “neuro-humoral” view.

The chapter on the Morbid Anatomy of Gout extends to some fifty or sixty pages, and is divided into two parts—(1) Articular, (2) Abarticular and Visceral Gout. The section on the articular changes is very good, and is illustrated by some very good woodcuts. The second part consists of a somewhat sketchy account of the pathology of all the systems of the body in its relations to gout, and in going through it we are reminded again about the tendency of specialists to see “gout” everywhere.

By far the best part of the book comes after these chapters, and deals with the clinical aspects of gout. The relationships of gout to other morbid states, the clinical varieties of gout, and the treatment of gout, are all most exhaustively and ably treated. The chapters dealing with these subjects are mines of information on the matters with which they deal, and will, we have no doubt, be largely consulted by a large number of practitioners throughout Great Britain.

The book is one of the most important on the subject that has been published within recent years.

Sir William Roberts is well known as one of our greatest authorities on all subjects connected with dietetics and digestion, and he has rendered a distinct service to the profession by collecting his numerous papers on this important department of medicine and publishing them in one volume. The present volume consists mainly of a reprint of the author's Lumleian lectures "On the Digestive Ferments and Artificially Digested Food," delivered in 1880, and his course of five lectures "On Dietetics and Dyspepsia," given at Owen's College, Manchester, in 1885. In addition, there are included in the volume a number of other papers on allied subjects. Our review of the second of the two publications named will be found in our issue for November, 1886, p. 370. The present volume is of great scientific interest and importance, and will take its place as a standard work of reference.


This small treatise, which we regret exceedingly not having had an earlier opportunity of noticing, supplies in a most efficient manner a want which has been greatly felt by the busy practitioners in our large towns, and by senior students and young physicians commencing practice.

It gives first, in a most concise form, the principles, physiological and chemical, which should be observed in the dieting of young children. Infants, according to our author, meaning evidently infants physiologically, not legally, that is children for the most part of two years and under, but applying in a modified degree to older children also.

Our author's discussion of the methods for rendering cow's milk more nutritive and digestible is most instructive and interesting, but we note that he does not refer to the fact that cow's milk may vary very much in strength, and that what we get in towns is often far from pure. This ought always to be taken into consideration in advising mothers as to the dilution required. We heartily agree with the writer that cow's milk should never, as a rule, be used raw, but should be boiled at once on being received from the dairy. We would no more think of using raw milk than of using raw meat, and we do that only in very exceptional cases.
Dr. Cheadle, secondly, discusses the diseases arising from errors in diet, and their treatment, and in doing so divides these into two classes—(1) those caused by irritation of the alimentary canal, by decomposing or indigestible articles of food, in which class are dyspepsia, stomatitis, thrush, gastro-enteric catarrh, choleraic diarrhoea, and the contrary condition, constipation; (2) those arising from defective nutrition, such as anemia, atrophy, rickets, and scurvy. Of course, the two classes are often combined as, for instance, when atrophy or anæmia is produced by long continued diarrhoea.

The chapters on these diseases in relation to diet are of extreme interest, and we would specially call the attention of our Glasgow readers to the two last chapters on rickets and scurvy, which are admirable and most instructive to us, as we are called upon so often to treat these diseases among the ill-fed children of our city.

We have enjoyed an unusual treat in reading this little book, and we have no hesitation in recommending it to others.


That section of our well-to-do classes who are in the habit of frequenting the continental spas and watering-places, and the fashionable physicians who have to advise them, are under a debt of gratitude to Mr. Henry W. Wolff for a very readable book upon the watering-places of the Vosges, a district situated in the north-east of France, westward of the upper reaches of the Rhine. In this district are a large number of spas which, although well known in France, have hitherto attracted comparatively little attention in England. Chief among these are Plombières, Coutrexéville, and Bourbonne-les-Bains. One advantage of all of these watering places is that they are within easy reach of English visitors, being only seven or eight hours journey beyond Paris, and we would advise any one who think of trying the waters of the Vosges previously to consult Mr. Wolff's book. It is written in an easy and racy style, and abounds with historical and topographical information, which cannot but be of great interest and importance to physicians and patients alike. The volume is furnished with a very useful map, and also with a series of tabular analyses of the different waters. We understand that the author is not a medical man, but notwithstanding, his work contains many useful hints as to the class of
cases suitable for each of the different spas, the opinions of various well known medical authorities being freely quoted. Altogether, we cordially recommend the book to the favourable consideration of our readers.

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So short a time has elapsed since we noticed the first edition of this handy little volume, that it is unnecessary for us to do more than remind our readers that a second and revised edition has now appeared.

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MEETINGS OF SOCIETIES.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

Session 1890-91.

Meeting VIII.—11th May, 1891.

The President, David Newman, M.D., in the Chair.

I.—CASE OF JAUNDICE FROM OCCLUSION OF THE COMMON BILE DUCT BY A SECONDARY CANCEROUS NODULE; CHOLECYSTOTOMY.

By Dr. Duncan and Mr. Parry.

Dr. Duncan showed for himself and Mr. Parry microscopic sections and a drawing of a scirrhouus tumour of the head of the pancreas, a secondary nodule of which was found at the orifice of the common bile duct, occluding it and projecting into the lumen of the bowel.

Dr. Duncan stated that the jaundice in this case began in the first week of January, at which time the attention of the patient had been called to the change in the colour of his skin by his wife. He had complained of feelings of discomfort in the region of his stomach for several months previously. This discomfort after eating was supposed to be due to dyspepsia. He had not had any pain, sickness, or vomiting, and there was no fever. He continued to attend to his business for several days after the jaundice appeared.
On examination on 6th January, no abnormal condition of the liver or gall-bladder could be made out. His stools were clayey; his urine was high coloured, containing bile pigment with bile acids; it was free from albumen and sugar.

During the first fortnight bile was noticed in small quantity in portions of the stools on several occasions, but after that it completely disappeared, and the gall-bladder became greatly distended. No other tumour or nodule could be discovered, and although there was no evidence of gall-stone or of ulceration of the duodenum to account for the obstruction, it seemed to Dr. Duncan that, both with a view to averting the danger of rupture of the gall-bladder and also to clear up the diagnosis, cholecystotomy should be performed. This was done by Mr. Parry on the 16th of February. The opening in the gall-bladder was stitched to the skin, and a fistula was left from which considerable quantities of a serous fluid tinged with bile escaped daily. The patient lived till the 28th of February, and died of exhaustion. At the operation a hard mass could be felt in the region of the head of the pancreas, which was supposed to be a scirrhus. At the post-mortem examination the conditions above-noted were found.

Mr. Parry referred to the difficulty in determining the nature of the obstruction in some cases, even when the gallbladder had been opened into. The nodule at the orifice of the common bile duct might easily be mistaken for a stone impacted in it.

Dr. Hector Cameron thought Mr. Parry's remarks of interest, in reference to the confusion even to the fingers of an operator between a cancerous nodule and a gall-stone. He related a case in which, after about forty gall-stones had been removed, a further hardness was felt in the common duct, and this proved to be not another stone, but a carcinomatous nodule. In drawing attention to a case, reported in a recent number of the British Medical Journal, of combined cancer and gall-stones, he expressed the opinion that the long continued presence of gall-stones is apt, when the cancer age is reached, to produce a cancer-growth in addition. This combination is apt to lead to difficulty in the midst of an operation.

Dr. Hugh Thomson said that it appeared to him that the whole interest of the case lay in the diagnosis between cancer and gall-stones, for if it was a case of gall-stones, there was a probability of a cure; but if cancer, there could be none, so that if one could diagnose between these two affections, the performance of an operation in a cancerous case would be
avoided. Dr. Duncan had said that there was no symptom of gall-stones. Then what was the object of the operation?

Dr. Newman gave it as his opinion that when cancer and gall-stones were associated, as he had seen at a considerable number of post-mortem, the gall-stones were produced by the catarrhal condition, and thus secondary. During post-mortem he had found difficulty in differentiating between a gall-stone and a hard cancerous mass, similar to that experienced during operation.

Dr. Steven asked if bile continued to be discharged from the fistula.

Dr. Duncan replied that a large quantity of fluid came away, but that it contained very little bile, as if the secreting power of the liver had been partly destroyed.

Dr. Finlayson thought that there was no doubt that the association of gall-stones and malignant disease of the liver was common, but could not speak from memory as to its relation to cancer of the pancreas. He agreed with Dr. Cameron that the gall-stones are primary, and the cause of cancer of the liver. He considered that it was quite open to question whether it was wise to open a person's gall-bladder, unless there was a fair chance of getting gall-stones, or unless there were such symptoms in the neighbourhood of the gall-bladder as to suggest the possibility of its rupturing. He thought it unfortunate when any one recommended an operation and rapid sinking followed, which, no doubt, the profuse discharge helped. Sometimes it is a mistake to open the gall-bladder; sometimes it is a mistake not to open it, as in a case which he had himself once communicated, in which rupture with fatal peritonitis had taken place. He asked Dr. Duncan with what expectation he had recommended the operation to be performed.

Dr. Duncan, in reply, said that he did not think it possible for any one to be perfectly certain of the diagnosis in a case like the present. They had no distinct evidence of a tumour; they had the fact that there was no pain of any consequence; they had the further fact that there was enormous distension of the gall-bladder, which might burst, as it had done in Dr. Finlayson's case. He had thought that the probability was that they had a tumour to deal with, and before the operation had expressed the opinion that there was a tumour of the pancreas, but with the danger of rupture he thought it right to recommend operation, with the idea that a probe might be passed which would relieve a stricture of the duct caused by pressure from the outside, or possibly by ulceration processes.
The man was dying in any case, and Dr. Duncan considered that he would not have done his duty had he not given him the chance of benefit from an operation. He did not think that the man had died because of the operation—perhaps death was not even hastened by it.

II.—HORSE-SHOE KIDNEY.

By Dr. Joseph Coats.

Dr. Coats pointed out that the ureters came off forwards and downwards, not inwards as commonly represented.

III.—FRACTURE-DISLOCATION OF CERVICAL SPINE.

By Dr. Joseph Coats.

Dr. Coats was of opinion that an immediate attempt at reduction, as by suspension, might have had a beneficial result. In reply to Mr. Maylard, he admitted that here, as probably in most cases, the most serious injury to the cord was inflicted at the time of the injury, but he still thought that some benefit might have resulted from stretching.

IV.—DERMOID TUMOURS OF THE OVARY.

By Dr. Hector C. Cameron.

Dr. Cameron showed (1) a multilocular colloid cystoma of the ovary, one compartment of which was lined by epidermis and contained hair, and teeth set in a mass of bone; (2) a dermoid of one ovary the size of a turkey's egg, from a case in which the other ovary was the seat of a multilocular colloid cystoma.

Dr. W. L. Reid mentioned, with respect to the former of these two specimens, that the young lady from whom it was obtained had, previous to the development of the tumour, suffered from amenorrhoea, and generally had been in weak health; whereas, from about the time the ovarian disease began to show itself, and with the development of the tumour, her health gradually improved, and she is now in excellent health.

Mr. Henry Rutherfurd drew attention to the homology of the colloid ovarian cystoma with the dermoid. The colloid, too, contained well-formed structures, often well-formed mucous glands. It seemed unjustifiable to assume that the dermoid was specially, and in all cases, of congenital formation. On the inclusion theory, all tumours might be of congenital origin.
V.—CARD SPECIMENS.

Dr. Coats showed (1) aneurism of a renal artery; (2) an autoclave steriliser for sterilising by steam under pressure; (3) some cultures.

Mr. H. Rutherford showed specimens with microscopic sections of (1) squamous-celled epithelioma of the leg; (2) epitheliomata of the dorsal surface of the fingers of the type of rodent ulcer.

Mr. Maylard showed a squamous-celled epithelioma of the hand, with microscopic sections.

ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

MEDICINE.

By John H. CarSLaw, M.A., M.B., C.M.

On Modern Methods of Diagnosis in Gastric Affections.—In the June number of the Bristol Medico-Chirurgical Journal there is a paper by Dr. J. Michell Clarke on the above subject. It has special reference to the chemical conditions in the stomach at different stages of digestion, as studied by withdrawing portions of the stomach contents; but the author claims to give an account, not of the most elaborate methods, but of such as can be easily carried out in out-patient work. A "test meal" having been given, the subsequent steps in the examination are thus described:

"1. A portion of the gastric contents is removed two hours after a meal, and filtered."

"2. The total acidity of the filtrate is estimated, and it is determined whether the acidity is due to free acid, acid salts, or both combined.

"3. The presence of hydrochloric acid is shown by benzo-purpurin and Günzburg's reagent.

"4. Lactic and butyric acids tested for by Uffelmann's reagent, by odour, &c.

"5. Determination of digestive potency of the gastric juice."

This "digestive potency" is tested by means of cubes of boiled white of egg. These are placed in the juice, and kept at the temperature required.

Another point to be attended to is the time taken by the stomach to empty itself of its contents, and here the ordinary methods of physical examination may be employed; but, when there is undue retention in the stomach, not only does this tend to dilatation of that organ, but there is also fermentation of its contents, with development of lactic and butyric acids. To ascertain when food passes out of the stomach into the duodenum, Ewald has used salol as a test, as that drug is known to remain unchanged in the stomach, but to split up in the duodenum into phenol and salicylic acid, and thus render its presence at once demonstrable from the urine.

From chemical investigations of portions of the stomach contents, as-
described above, cases are grouped according as they show deficiency of hydrochloric acid or excess of it, the latter either merely during the periods of digestion, or during these periods and also during the intervals. The last mentioned variety, in which there is excess of hydrochloric acid apart from digestion, generally implies some dilatation of the stomach, "which Riegel thinks may arise from spasm of the pylorus, excited by the excessive acidity, hindering the outflow of the stomach-contents." Both forms of hyper-secretion of hydrochloric acid are attended by pain and other symptoms of dyspepsia.

In round ulcer and in chlorosis there is commonly excess of hydrochloric acid, a case of the former disease being quoted which showed an acidity of 3 per cent instead of the normal 1 or 2 per cent. The connection between gastric ulcer and anemia may possibly be thus explained, the hyper-acidity being considered part cause of the ulceration.

On the other hand, lactic and butyric acids are sometimes in excess; but then hydrochloric acid is usually deficient. "The secretion of hydrochloric acid is deficient or absent in (1) cancer of the stomach, (2) atrophy of the mucous membrane, (3) sometimes in the continued fevers, (4) in dyspepsia nervosa, and (5) very occasionally in persons otherwise in apparent good health."

The absence in cases of cancer of the stomach, though not claimed to be universal, is of special diagnostic value in doubtful cases, and had been demonstrated by Dr. Clarke in each of eight cases of cancer of the stomach which he had tested repeatedly. In illustration he quotes, among others, the following:—"A man of 77, fairly well nourished and of healthy appearance, had suffered for three months from epigastric pain and sickness after meals, and on one occasion from slight haematemia. The epigastrium was tender; but it was difficult to explore it thoroughly from the roundness of the thoracic cage, and the prominence of the lower ribs. We could never discover any tumour, nor was there any dulness over the stomach, which, moreover, was at no time dilated. Hydrochloric acid was absent from the gastric juice. The man emaciated, grew slowly worse, and died in about two months. At the autopsy a cancerous growth was found at the cardiac end of the stomach, close to the entrance of the esophagus, and, therefore, so placed that it could never have been felt during life."

Dr. Clark holds that, by means of this test, aid can be obtained in diagnosing between carcinoma of the stomach and other abdominal (e.g., pancreatic) cancerous tumours, the latter being especially puzzling when they cause a dilatation of the stomach by mechanical compression of the pylorus. He also considers the test of high value in discriminating between gastric cancer and gastric ulcer, and claims that the procedure is attended by no danger if one uses a "soft indiarubber tube without a stiffened end, such as that sold under the name of Jaques' patent." (The investigation must, however, often be very complicated, especially in cases where there is dilatation of the stomach.)

Though not proposing to apply these methods in all dyspeptic cases, he holds, further, that "when dyspepsia does not yield to treatment, we may often obtain valuable information from the procedure as to what ingredient of the gastric juice is deficient or in excess, and thus be enabled to modify the treatment accordingly, and so give relief."

**Massage in Dyspepsia.**—The importance of massage in the treatment of chronic dyspepsia is insisted upon by Dr. Joh. Cséri, in a paper published in *Post Med.-Chir. Pr.*, No. 37, 1890. In employing this method of treatment he chooses a time two or three hours after the chief meal of the day, when the stomach is still full; and he then strokes and kneads that organ from cardiac extremity towards pylorus, at first lightly, but afterwards more firmly. After this has been continued for ten to fifteen minutes he extends the treatment to the bowels. The patient is placed with the knees drawn up and lies with the mouth open. The stomach is freed from the gases which have accumulated
in it, and the passage of its solid contents into the duodenum is assisted by purely mechanical means. The peristaltic movements, if defective, are restored by the improvement in the condition of the muscular coats. Further, the pyloric orifice is said to be rendered permanently more patent, and much pain in cases of nervous dyspepsia thus avoided. Cases of dilatation are specially mentioned as suitable for this form of treatment. It is, of course, inapplicable if there be ulcer or tumour present.—(Deut. Med.-Zeit., 28th May, 1891.)

Palpation of the Abdomen.—The difficulty of abdominal palpation on account of spasm of the recti muscles is stated by Dr. v. Chlapowski of Kissingen to be in great part overcome if the patient be examined while lying in a warm bath. Of this modification of physical examination he gave an account at the meeting of the Balneologische Gesellschaft at Berlin in March of this year. He stated that not only is the patient more readily moved from one position to another, but also that the pressure during examination causes much less pain in the bath than otherwise. Details are thus better obtained than in bed as to the situation and boundaries, especially of inflammatory swellings in the region of the cæcum; and similar advantages are obtained in the case of tumours of the liver, spleen, &c. It is even claimed that, by this device, examination under chloroform will in many cases be unnecessary.—(Deut. Med.-Zeit., 8th June, 1891.)

Paralysis of the Bladder in Nervous Affections.—In the Verein für innere Medizin in Berlin, on 25th May, 1891, Hr. Posner and Hr. Ehrenhaus showed a case of what they regarded as acute myelitis, in which bladder symptoms had preceded all others, and in which the rapid recovery negatived the bad prognosis, which they had formed, in accordance with the view that the earlier and more intense bladder symptoms are in disease of the spinal cord, the more serious is that disease likely to prove.

The patient was a girl of 11 years, and on 28th April, 1888, she had become colded and taken ill with sore-throat and feverishness, which soon passed off, but left her exhausted. On the night of the 3rd-4th May she had retention of urine, requiring catheterisation; when this retention had lasted for two days (5th May) a paralysis of the legs began to develop, most distinct in the left. On 6th May both patellar reflexes were found abolished. The retention of urine was recovered from when it had lasted for six days. On 11th May the paraplegia began to improve; on the 16th the tendon reflexes had returned; and on the 31st the patient could walk without any assistance, and with only a slight dragging of the left foot.

Diphtheria is said to be excluded, but was regarded as a very probable diagnosis by one of the speakers in the discussion, following the reading of the paper. Meningitis and infantile paralysis are also held to be out of the question, and the case considered to have been one of acute myelitis.—(Deut. Med.-Zeit., 4th June, 1891.)

Sequela of Influenza.—In the Petersburg Med. Wochenscr, No. 46, 1890, Dr. Oskar Johannsen gives an account of a case of gangrene of the foot, which occurred in a patient of 52 years of age (male), who was suffering from influenza and from an acute nephritis which had arisen in its course, and had lasted for two weeks. He had also slight paresis of the right arm, and, the day after this was first noticed, he felt pain in the right foot, which persisted, and soon became associated with swelling and discoulouration. Amputation was performed through the middle of the thigh, and all the veins there were found filled with firm thrombi, showing that the gangrene was secondary to a venous thrombosis. With this case is compared that of a girl of 15 years, who, in the course of influenza, developed a severe phlegmasia alba dolens of the leg, from which she recovered.—(Deut. Med.-Zeit., 2nd July, 1891.)
DISEASES OF THE SKIN.

By DR. A. NAPIER.

On Cutaneous Psorospermosis, Molluscum Contagiosum, and Paget's Disease. Professor Nikolai P. Mansuroff (Proceedings of the Fourth General Meeting of Russian Medical Men at Moscow, 1891, No. 2, p. 67, and No. 8, p. 267).—Professor Mansuroff, of Moscow, contributes an able and exhaustive paper on the subject, in which he advocates the following general propositions:

1. As regards their etiology, Darier's *psorospermosis cutanea, molluscum contagiosum*, and Paget's disease of the nipple belong to one and the same group of parasitic affections of the skin, all three being caused by coccidia (sporozoa or gregarines).

2. Certain differences in their clinical manifestations depend solely upon peculiarities of the layer involved.

3. All the three forms represent purely local affections, and yield to appropriate local treatment.

4. The infection occurs mostly through the agency of lower animals, the parasites penetrating into the cutis, probably, both through the circulation and from without.

Case of Darier's Psorospermosis. Dr. Ivan F. Zeleneff (Врач, No. 12, 1891, p. 318).—At a recent meeting of medical men attached to the Kiev Military Hospital, Dr. Zeleneff showed a soldier, aged 22, with psorospermosis of six years' standing, the dermatosis having commenced with the eruption of numerous, slightly itchy, dirty-greyish small "warts" on the nose and cheeks, and later on, about six months afterwards, on the hands and in the groins. At present the patient's whole body is involved, the affection being most intense on the hairy scalp, face, scrotum, around the anal orifice, and on the dorsal aspect of the hands and feet. The eruption consists of hard, dry, horny, dirty-brownish or grey flat papules, which are either scattered indiscriminately, or aggregated in groups, or form rather prominent patches, resembling fairly regular ovoids, or quadrangles with rounded angles. Each papule contains in its centre a minute black point, or (especially on the head) a hair. "Extermination of the horny structures leaves bleeding spots." Both scraping and extirpation are painless. Only the lesions on the face are somewhat itchy, none of the remaining being accompanied by any abnormal sensations at any stage of their development. Having attained a certain size, the tubercles undergo atrophy, leaving scars. The skin between the papules and patches is perfectly normal everywhere, except about the nose, in which situation there is present an undue amount of vascularity, much resembling the state of things in cases of acne rosacea.

The patient's father, aged 60, is suffering from cutaneous cancer of the glabella.

Alopecia Areata, its Pathology and Treatment.—Dr. Radcliffe Crockert, in his address, introductory to the discussion on the above subject, which was delivered at the meeting of the British Medical Association on 30th July, 1890, and which appeared in the Lancet of 28th February, 1891, gives an interesting account of his views of the nature of the malady, gathered mainly from his own experience.

He has analysed 207 cases of this affection which occurred among nearly 10,000 cases of skin disease in hospital practice, as well as 50 cases selected from his private patients. He concludes from this analysis that the disease occurs most commonly in persons under the age of 20, comparatively frequently among those between 20 and 40, and rarely in those over 50, and he finds that it rather more frequently attacks males than females. The cases are divided by him into four classes:—
1. Cases in which the disease is universal, and in which the hair does not necessarily come out in patches, but there is a general falling off, often very rapid, and accompanied in severe cases by changes in, or even falling off, of some or all of the nails.

Cases of this class are rare.

2. Baldness occurring in one or more patches at the site of an injury to, or in the course of, a recognisable nerve.

This variety is also comparatively rare.

3. Alopecia circumaniscripta seu orbicularis, described by Neumann, characterised by atrophically depressed patches, which are small, and often show a marked decrease in sensibility.

These cases are very rare. (Two instances are briefly described by Sangster and Pringle in the British Journal of Dermatology, vol. ii, No. 2, 1890, p. 51.)

4. Numerically the largest class, to which he considers the old term "tinea decalvans" might fairly be applied (due as the writer believes to a vegetable parasite). This class he illustrates by four different figures, showing various forms of patches which are characteristic of the class. They are from a half to two inches in diameter and of round shape primarily, but they may be larger and irregular in outline from coalescence of neighbouring patches. They commence most frequently at the back of the head, but may be scattered all about the scalp, or as a band passing round the head. "The bare areas are smooth and white, and the tissue is lax and thinner than normal skin. In all recent and active cases there are short, "mark of exclamation" (!) or "club-shaped" hairs, which can be pulled out easily, and are, in Dr. Crocker's opinion, quite characteristic of this form of the disease, as he believes they are absent in the other three classes. They indicate recent extension.

He has been unable to trace any connection between the disease and disturbance of the general health, except in very few instances.

Among his fifty private cases he admits that seven afford some fair grounds for being considered neurotic; in other words, the neurotic theory was inapplicable to nine-tenths of them.

With regard to contagion, he mentions some good cases supporting the view that the disease is under some circumstances directly conveyed from one person to another, and he is of opinion that some cases have been contracted through contact with ringworm.

Believing, as the author does, in the close connection between ringworm and his fourth-class of alopecia areata, he naturally calls careful attention to his method of examining suspected hairs, which is briefly as follows:—Pull out a good many of the loose hairs at the border of a patch, examine them with a lens, and select those which have most root-sheath attached. Cut offsuperfluous shafts of these hairs, soak the root ends in liquor potassa or a saturated solution of caustic potash in glycerine, and examine the portions of epidermis attached to the shaft, handling them carefully so as not to detach the affected part. "The fungus is always in small foci, and perhaps only in one of several selected hairs; sometimes it may be seen at the very extremity of the root, as if it had worked round and separated the hair from its papilla."

With regard to his fourth-class, he concludes by saying—(1) That this form is to a limited extent contagious, and that from time to time limited outbreaks have occurred in small communities; (2) that not only children, but adults who have been in contact with tinea tonsurans sometimes develop bald patches indistinguishable from alopecia areata; (3) that in tinea tonsurans commencing in the typical way, the characteristic crooked stumps may both spontaneously and under treatment disappear, and the patches develop into an alopecia condition, with (!) hairs; (4) that in those countries where tinea tonsurans is most common alopecia areata is also most frequent; (5) Hence we must conclude that a large proportion of cases in adults which are termed alopecia areata are cases of bald tinea tonsurans, which is acknowledged to exist amongst children, and that the old authors, from Bateman
onwards, were justified in calling it porrigo, or tinea decalvans; (6) finally, I believe that a parasite indistinguishable from tricophyton tonsurans fungus may be demonstrated in recent cases, and the treatment most efficacious is inunction of powerful and stimulating parasiticides.—(The British Journal of Dermatology, June, 1891.)

Arsenic as a Drug. Jonathan Hutchinson (Brit. Med. Journ., 6th June, 1891).—In his post-graduate lecture delivered on the 2nd inst. Mr. Hutchinson confined his attention almost entirely to the therapeutical effects of arsenic from the dermatologist's point of view. Certain forms of skin disease are influenced rapidly and with certainty by arsenic. Foremost among these comes pemphigus diutinus or persisting pemphigus. "As a rule, no fresh bullae are produced after the administration of the arsenic has been commenced, and the patient quickly regains health, with perfect soundness of skin." There are, however, some exceptional cases occurring in elderly people and those which are complicated by disease of the mucous membrane of the mouth which do not so yield to treatment. A typical case of dermatitis herpetiformis under his observation for six or seven years was always cured in the most definite manner and very quickly by the use of arsenic. A case of severe erythematous eruption on limbs and trunk of a boy, which had defied treatment previously, at once yielded to arsenic and disappeared.

In psoriasis, although the effect of arsenic is quite as definite and certain as in pemphigus, it is not so immediately curative. It seldom or never brings about a complete cure of this malady.

In lichen planus its effect seems to be uncertain; sometimes it has seemed to be of great service, at others to have aggravated the disease.

The influence of arsenic seems to be unfavourable, as a rule, in elderly persons, especially if symptoms of nerve degeneration be present. It aggravated, for instance, a case of paralysis agitans. While it seems to check recurrent herpes, it may in some cases bring on herpes zoster, when administered for other affections, by apparently setting up peripheral neuritis.

Attention was specially drawn to some of the ill-effects of large doses or too long continuance of the drug, such as local numbness, especially of portions of skin of lower extremities, numbness and tingling of the soles of the feet, brown and muddy-looking discoloration or actual pigmentation of the skin, scaly patches forming on knuckles, elbows, and knees, much resembling common psoriasis, but less circumscribed; dryness of palms and soles from disturbed nutrition; formation of corns and, in very exceptional instances, the passage of these corns into epithelial cancer.

Antipyrin in Skin Diseases. In a paper read before the Berlin Dermatological Society, Blaschko drew attention to the great value of antipyrin in diseases of the skin, more especially those accompanied by pruritus, many of which may be regarded as neuroses of the skin. He recommends it very strongly in the affection met with in children where urticaria-like papules appear chiefly on the extremities, more especially at night-time, and lead not infrequently to definite itching nodules, called by some writers "prurigo," by others "lichen urticatus," or urticaria papulosa. In this disorder the irritation is often so severe as to prevent the child sleeping properly for months or even years, and may cause serious interference with the general health. It may be referred to an increased reflex excitability of the nerves of the skin, combined with hyperesthesia of the cutaneous sensory nerves. The internal administration of antipyrin was combined with local treatment in the shape of tar baths and naphthal ointment; and the result was most striking. In all the cases the itching and scratching lessened during the first week, and the children began to sleep; only in very few cases did fresh nodules appear, the majority losing the rash steadily. The action of the drug may be ascribed to its breaking a vicious circle, and Blaschko believes that it does so by affecting the vascular nerves. It may be given in powder or solution thus:—
DISEASES OF THE EYE.

By FREELAND FERGUS, M.B.

Cataract Extraction.—A very important series of cases of cataract extraction from Schweigger’s clinic has lately been published by Grefe. He gives details of 250 operations, all performed during the last few years without iridectomy. His contention is that the operation without iridectomy is just as simple as with it, and that the results obtained are quite as good; hence the argument that iridectomy is not required for many cases. For sake of comparison a series of cases of combined extraction, performed between 1883 and 1884, and amounting in all to 122 cases, is also recorded.

Here are the percentages and numbers of successes and failures for combined extraction:

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<tr>
<td>Successes</td>
<td>89</td>
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<tr>
<td>Secondary cataract</td>
<td>27</td>
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<td>Losses</td>
<td>6</td>
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<td>122</td>
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The capsule in these cases was ruptured with the Schweigger-Förster capsular forceps.

From the first series of simple extractions we get the following results:

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<tr>
<td>Successes</td>
<td>112</td>
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<td>Half-successes</td>
<td>22</td>
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<tr>
<td>Failures</td>
<td>6</td>
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<td>140</td>
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In these cases, also, the capsular forceps were used, and a knife very much like Beer’s triangular one. Professor Schweigger in all cases makes a very large incision, and thinks that a small one is dangerous.

The last series of cases is also of importance:

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<tr>
<td>Complete success</td>
<td>185</td>
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<tr>
<td>Secondary cataracts</td>
<td>39</td>
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<tr>
<td>Losses</td>
<td>11</td>
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<tr>
<td></td>
<td>235</td>
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The only difference between this series and the preceding is that Grefe’s cystitome was used. Of course a large proportion of the secondary cataracts got good sight after a secondary operation.

The feature which we like least in the series of cases thus recorded is the
large number of cases in which prolapsus of the iris has occurred. Thus, in
the first series of simple extraction, this accident occurred 9 times; in the
second, 20 times. Still, in only one case could absolute loss of sight be traced
to this condition; in almost all these cases fair sight was obtained. We
believe that an explanation of success is to be found in the very careful
aseptic precautions observed. We have long been of opinion that iritis of
severe degree, choroiditis, and choroido-cyritis following cataract extraction
are septic, and therefore to a large extent preventible. Another fact recorded
in this paper, and one which entirely agrees with our own personal experience,
is that suppurative keratitis is chiefly found in hospital practice.

Out of the last series of 235 cases, six eyes were lost from suppurative
keratitis or hyalitis. These were done in the hospital. Greef says—"It is very
curious that in Professor Schweigger’s private hospital there has not been a
single case of infection after extraction since the introduction of strict asepsis;
while in the University Hospital, where precisely the same aseptic precautions
have been scrupulously carried out, it has been impossible to avoid an
occasional loss from infection of the wound." Our own experience is similar.
Amongst a large number of extractions we have only lost two from suppurative;
both were hospital cases.

Prolapsed iris Schweigger treats with abscession if it be large, or if of
medium size; when the prolapse is small he leaves it alone.

The following paragraph is of such importance that we give it at length.
We thoroughly believe it to be true if the eye is kept aseptic:—

"We have not been able to discover that prolapse of iris is always
associated with repeated attacks of iritis, or that iritis is more frequent after
simple extraction than after extraction with iridectomy. We no longer have
any faith, as Schweigger has expressed it, in an ‘antiphlogistic iridectomy.’"

Disseminated Sclerosis or Primary Spastic Paraplegia.—
Charles Zimmermann of Milwaukee has lately recorded a case in which the
clinical aspect of the disease closely resembled primary spastic paraplegia, but
which he thinks must have been disseminated sclerosis. He bases this
diagnosis entirely on the ocular symptoms. The patient first consulted him
in 1886 for dimness of vision of the right eye, and for diplopia. The diplopia
was crossed, and due to paralysis of the right internal rectus muscle. There
was at this time atrophy (white) of the outer half of each optic nerve.
Although the patient recovered from the diplopia, the atrophy still persisted.

Zimmermann again saw him in March of this year. He had all the
symptoms of spastic paraplegia, but with some complications which led to the
diagnosis of disseminated sclerosis. The most important of these complications
were atrophy of parts of both optic nerves; the sudden onset of amylopia (in
one eye) and the speedy recovery of sight; the lasting ophthalmoscopic
appearance of atrophy, with amelioration of vision to its normal acuteness,
and the discrepancy between the ophthalmoscopic condition and the perfect
performance of the function of the optic nerves; its early appearance before
any other symptom could be observed. From the authors quoted by Zimmer-
mann there seems no doubt that optic neuritis, when it accompanies sclerosis,
very quickly gives place to atrophy. The atrophy of the optic nerves in these
cases is chiefly a change in the medullary sheath, the axis-cylinder presenting
little or no change; hence the restoration to sight when the neuritis subsides.
Archard and Guinon have described a case in which spastic symptoms were
present; the patient was at first blind, but sight was restored to some degree.
The patient died from other causes, and patches of sclerosis were found in
three situations—viz., two in the spinal cord, and one in the optic nerve and
tracts. Our author lays special stress on the paralysis of the right internal
rectus muscle being one of the early symptoms, and believes "that this paresis
was caused by the development of a sclerotic patch at one of the nuclei of the
third nerve, only affecting the branch which supplies the internal rectus
muscle as long as the incipient sclerotic process was irritating it by the inflam-
matory proliferation of connective tissue elements of neuroglia. As soon as the
eye atrophied and the pressure ceased, which the inflammatory swelling had
affected, the persistence of the axis-cylinders (characteristic of a sclerosis)
admitted of a perfect functional recovery.

**Hemianopia with Agraphia.**—Weeks records two very interesting
cases, which he summarised as follows:—

*Ccase I.*—1. Homonymous right-sided hemianopia—left occipital lobe.
2. Amnesic aphasia—isle of Reil. 3. Agraphia—isle of Reil and posterior
part of lower frontal convolution. 4. Partial loss of power in the right side,
in the upper extremity particularly; motor area of the right side greatest in
the middle third of the ascending frontal and parietal convolutions."

*Ccase II.*—"a. Due to lesions on the right side. 1. Homonymous left-sided
hemianopia—occipital lobe. 2. Paresis of the muscles of the lower part of
the face, and the tongue on the left side—lower third of ascending frontal and
parietal convolutions. 3. Anaesthesia (partial) of the left side; affection of
the motor area. 4. The transient hemiplegia due to temporary derangement
of the motor area.

"b. From lesions on the left side. 1. Word deafness—posterior third of first
3. Defects in the visual field of the right eye—anterior part of visual area,
occipital lobe. 4. Amnesic aphasia—isle of Reil and vicinity. 5. Agraphia
—isle of Reil and posterior third of lower frontal convolution. 6. Right-sided
hemiplegia—motor area. 7. Anaesthesia of right side—motor area. The
permanent defects from lesions in the right hemisphere are hemianopia,
paresis of the lower part of the face and tongue; anaesthesia. From lesions
in the left hemisphere—small defect in the visual field, amnesic aphasia,
agraphia, anaesthesia."

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**Books, Pamphlets, &c., Received.**

Lead-poisoning in its Acute and Chronic Forms. Goulstonian
Lectures, March, 1891, by Thomas Oliver, M.A., M.D.,
Differences in the Nervous Organisation of Man and Woman,
Physiological and Pathological, by Harry Campbell, M.D.,
B.S. Lond. London: H. K. Lewis. 1891.
Epidemic Influenza: Notes on its Origin and Method of Spread, by
Richard Sisley, M.D. London: Longmans, Green & Co. 1891.
Spasmodic Wry-neck, and other Spasmodic Movements of the Head,
Face, and Neck, by Noble Smith, F.R.C.S. Ed. London:
Smith, Elder & Co. 1891.
Handbook of Diseases of the Ear for the Use of Students and
London: H. K. Lewis. 1891.
Contributions to Practical Medicine, by Sir James Sawyer, Kut.,
Doctrines de l'école Italienne, par Jules Soury. Paris:
Bureaux du Progrès Medical. 1891.
New Official Remedies B.P., 1890, Supplement to Materia Medica
1891.
CONGENITAL TALIPES: SOME CASES BEARING ON ITS ETIOLOGY.

BY J. A. WILSON. M.D., SPRINGBURN.

For some time my attention has been directed to the subject of congenital deformities, especially to the etiology of talipes and other malformations of a similar nature, from the fact that a series of interesting cases of this kind has come under my immediate observation, in whose clinical history there are some points of an unusual nature, and probably suggestive of the method by which they have been produced.

There is still considerable difference in opinion regarding the etiology of congenital club-foot. There are obvious difficulties in the way of investigating an intra-uterine process—a process the origin and nature of which is to be judged mainly by a study of the results—and that this indirect method of inquiry should lead to variety in opinion is not surprising. I wish to review the etiology in the light of my cases and make some observations.

The various theories may be tabulated as follows:—

1. Primary malposition of the tarsal bones.
2. Disorder of the nervous system of the foetus, causing (a) spasm of the muscles, (b) paralysis of the muscles.
3. Developmental.
4. Mechanical.
It may not be out of place if I give here some extracts from various authors to illustrate the different theories.

Scarpa believed club-foot to be caused by malposition of the bones.

Dr. Little believes it to be due to muscular contraction depending on disorder of the nervous system of the foetus.

William Adams, in his Jacksonian prize essay, says he is disposed to agree with the spasmodic rather than the mechanical theory.

Mr. E. Noble Smith, in his Surgery of Deformities (1882), supports the theory that congenital club-foot is due to disturbance of the nervous system, causing muscular spasm in the foetus, and lasting sufficiently long to set up a shortened state of the muscles.

Professor Sayer, in his Lectures on Orthopaedic Surgery (1876), says:—"I believe that nearly all cases of congenital talipes, if examined immediately after birth, would be found to be paralytic in their nature."

Billroth, in his Clinical Surgery, supports the theory of arrested development, and says—"With reference to the causation of the arrested development, we are able at present to give just as little explanation as of other deformities of this kind."

The mechanical theory finds supporters in Cruveilhier, Lonsdale, Tamplin, and in a recent monograph by R. W. Parker.

These extracts show that opinions are somewhat conflicting, and although some eminent writers are still supporters of the theory which supposes the existence of a central or nervous cause operating in such a manner through the muscles as to produce peripheral deformity, still the tendency of general opinion at present is to depart from this, and to favour the developmental and mechanical theories.

If my experience is not too limited to warrant me in having an opinion, my preference would be for a theory which embraces both the developmental and the mechanical. I will now proceed to narrate my cases and endeavour to sustain my preference.

Case I.—Mrs. M'D. was attended by me in her ninth confinement, on 12th April, 1887. She was at this time 36 years of age. The confinement itself was normal, and the head was the presenting part. The child, when born, was found to have typical double talipes varus, but otherwise it was a healthy well formed male child. She suckled the child
only for seven weeks, and her next child was born on 3rd April, 1888—that is, in less than a year from the previous one.

**Case II.**—On this occasion the presenting part was the breech, and the child, a small male, was dead when born. This child was probably born some weeks before full time, and it also had double talipes varus; but, moreover, both hands had a distinctly crushed appearance, the fingers being flexed and closely applied to the palms. On attempting to open the hands the little, ring, and middle fingers were found to be firmly held in this position, and could not be extended by a force short of violence, while the thumbs and index fingers were unfixed, and could be opened out easily. Still further, both legs were drawn up, so that the thighs formed with the abdomen about a right angle, and any endeavour to straighten the legs by pushing down the knees succeeded only at the expense of bending and raising the trunk from the horizontal, doubtless due to shortened psoas and iliacus muscles pulling on the spine. There were no other deformities.

**Case III.**—I was called again to this patient on 3rd January, 1889, and found her prematurely in labour (seventh month). The pains had begun only a short time before I arrived, and were then strong and frequent. On making a vaginal examination the membranes were found presenting as a large bag, and well down. The os uteri could only be reached with difficulty, and the presentation could not be made out. The bag felt unusually tense and resisting. The pains continued to be severe and frequent, and every minute I expected the membranes to give way. Ultimately I proceeded to rupture them, but found this more difficult to do than usual, and had to press my finger forcibly against the bag during several pains before I succeeded. The amount of liquor was large, and its escape gave the patient what she called "great relief." The os was then found to be high up, only dilated to the size of a crown-piece, and through it the head could be felt. I was struck with the disproportion between the size of the bag and the amount of dilatation of the os. As soon as the liquor had escaped, the pains, which had been strong and regular, ceased entirely, having lasted between two and three hours. There was still some fluid in the uterus, for, on passing the finger between the head and the os, I could allow more to escape. She remained in bed in this condition, with no pains until 6th January (three days),
when feeble pains came on, and after some hours she gave
birth to a small seventh-month female child.

When born the heart was beating, but the usual means
failed to induce respiration. This child presented deformities
similar to those of the previous one, only this time they were
more wide-spread. There was again double talipes varus;
the soles of the feet, looking inwards, had an attitude in
which the one was applied to the other. The legs could not
be straightened, for both were flexed on the thighs, and could
only be half extended, the tendons behind the knee-joints
being felt to check any further attempt in this direction.
Both thighs were drawn up, as in the previous case, forming
with the abdomen about a right angle. The fingers of both
hands were also again affected. Those of the left, excepting
the thumb, were flexed on the palm and firmly fixed in this
position. Those of the right were similarly affected, but only
the middle and ring fingers were fixed; the others could be
opened. Both fore-arms were flexed on the upper, and while
they could be flexed to the full extent, they could not be
extended beyond the right angle, and then the tendons of the
biceps muscles stood out prominently when any force was
used. Further, a peculiar condition of the cheeks was
observed. Each presented a distinct rounded thickening at
its centre, and a surface marking sufficient to attract the eye.
No other deformities or bone deficiencies were made out. In
all the foot deformities there was a degree of flexion as well
as inversion. The soles of the feet in the last case looked
inwards, but in the first and second cases they looked more
backwards.

This woman is an intelligent, matter-of-fact person, and not
in the least inclined to exaggerate her own complaints. She
has borne a large number of children, and should therefore be
able to recognise anything unusual in her condition when
pregnant. The history of her condition during the second
and third of these pregnancies is unusual and suggestive. I
will only describe her condition during the latter. She
complained of stiffness about the abdomen, of such a nature
that it prevented her sitting up in bed. She could not stoop
to get down to the floor without first getting down on her
knee, and to step up on a chair was an impossibility.
Something within the abdomen offered unusual resistance
to any attempt at bending the body at this part, and this,
she thinks, began early in her pregnancy. During her
pregnancy the abdominal enlargement was very much less
than in her former pregnancies; so much so, that at a time
when abdominal enlargement is usually marked, she had not the appearance of a pregnant woman. With this I was at once struck, when on one occasion she informed me of her condition, and the advanced stage at which she had arrived. A few weeks before her confinement she got rapidly larger. She had varicose veins, and these became severely distended and inflamed. Throughout her pregnancy she did not feel much movement of the foetus, and nothing resembling convulsions, but when the child did move it caused her much pain. When she enlarged a few weeks before her confinement, the movements became less painful, but they again became painful after the rupture of the membranes and the escape of the liquor amnii. Apart from the pain produced by the movements of the child, she suffered at times from a severe and enduring abdominal pain, which produced sleeplessness, and sometimes vomiting and purging. On the whole her condition during her pregnancy was one of severe discomfort, and her confinement brought a welcome relief. She was quite convinced that there was something wrong. Her husband also testifies that she suffered much.

These remarks are, as stated, descriptive of the last of these pregnancies, but during the second she suffered in a similar manner, though less severely, while during the first she did not suffer or experience anything unusual or different from her condition in her previous pregnancies.

The subsequent pregnancies in this case may not be without interest:—I saw her on 31st August, 1889, when she informed me that she was again pregnant, and in her third month. I find entered in my note-book the following remark regarding her condition at this date:—"Her present condition is different from that in her two previous pregnancies. The abnormal sensations are absent;" and again, on 21st November, "She is now showing considerable abdominal enlargement. The movements of the child do not cause pain. She thinks everything is right this time, and expects the child to be well formed." She was confined on 8th March, 1890. The confinement was quite normal, and the child (a female) was alive and well formed.

She was again confined on 26th June, 1891, and was delivered with forceps, after having had weak pains for about five days. The child was in a very feeble condition when born, and died the following day in convulsions. This child presented no deformity. During her pregnancy she had no unusual symptoms, and was able to tell me on several occasions that their was "nothing wrong this time."
present she is well, and there is no evidence of disease or displacement of the uterus.

My patient has thus given birth to three deformed children in succession, the deformities in each case becoming more and more aggravated, but in every case there was double talipes varus. The first child had only double talipes, and the phenomena of pregnancy and labour were normal. The second had superadded flexion of the thighs and clubbing of some of the fingers, while the child was born probably a little before full time. The presenting part was the breech, and the pregnancy manifested some symptoms of disorder. The third child had all the deformities of the previous, and in addition both fore-arms and both lower legs were flexed on the upper, and could not be extended beyond the right angle. The presenting part was the head, and the pregnancy also manifested symptoms of disorder. Further, the phenomena of the confinement were distinctly unusual.

There was progressive severity in the symptoms of disorder, progressive severity in the deformities, and progressive prematureness in the confinements; while in her last two pregnancies there was an absence of disorder and also an absence of deformity in the children.

These cases are probably uncommon, and may be thought to be so much so as to suggest their causation having been something accidental or uncommon, rather than a common or usual cause operating in an unusually severe manner. The first case was an ordinary or typical one of talipes, which presented subsequently the usual obstinacy to treatment, and necessitated the usual protracted attentions. A healthy woman, who has already given birth to a considerable number of healthy children, within the space of two years gives birth to three deformed ones. It will probably be granted that these cases, although differing very much in degree, beginning in the ordinary and passing into the extraordinary, are the same in nature and causation. If so, Cases II and III may throw some light on Case I—that is, the extraordinary (which may lend itself more to the operation) may illustrate the ordinary, and so assist us in comprehending the production of an ordinary case of club-foot.

Club-foot is sometimes said to show indications of being hereditary, but I can find no evidence of such in either branch of the family history, which on the whole is good.

In several of this woman's confinements the presenting part has been the breech, and several times she has required the forceps. She informs me that she suffered from inflammation
of the womb after her seventh confinement, and was ill for five weeks. Her next child was dead-born, and then came my Case I. She has been married for sixteen years, and during that time she has given birth to thirteen children, and her family is healthy.

What is the explanation of the abnormal manifestations of the pregnancies corresponding to Cases II and III, and especially Case III? The abdominal enlargement was less than usual. The peculiar stiffness of which she complained was doubtless connected with some uterine condition, and, with the other symptoms, was contemporaneous with the pregnancy. In all her previous pregnancies she never felt anything like it. The movements of the foetus caused her great pain, a symptom suggestive of the immediate contact of the foetus with the uterine walls. The enduring abdominal pain is also something new in her experience, and calls for explanation. She remarked that the pain was quite distinct from that produced by the movements of the foetus. Within an hour from the onset of labour I found already formed, and well down in the vagina, a large bag of liquor amnii, while the os remained comparatively small. Her condition in the early part of pregnancy was not one which suggested the existence of excess of liquor—rather the reverse. Why did the labour pains cease as soon as the liquor escaped, and not return for three days? Under ordinary circumstances the result is usually the opposite. Possibly the cause of the uterine contractions had been removed. An accumulation of liquor in a rigid or unyielding uterus might dispose to the formation of the bag of waters, and determine the onset of labour. If so, the prematurity of the labour would own a relationship to the environment of the foetus, which would point to the seat of the disorder.

A probable theory gathered from these various items in the history of the case is that during the first five months there has been a distinct scantiness of liquor amnii, with, perhaps, an unyielding or rigid condition of the uterus, explaining the stiffness, the want of abdominal enlargement, the pains, the sickness, &c. In the sixth month there was a somewhat rapid accumulation of liquor amnii, causing her to increase in size in an unusually rapid manner, and giving her relief from her discomfort. On this followed an increase of uterine tension, which ended in the production of premature labour pains; these, again, ceased on the escape of the liquor, and this was followed by the reappearance of the feelings of discomfort, from the draining away of the liquor probably reproducing the former state of matters within the uterus.
It should be remarked that the liquor, at the time of the confinement, was not deficient in amount. It is sometimes said, and said as an argument against the mechanical theory, that in club-foot pregnancies there is often no deficiency of liquor; and the observation is true of my cases, at least at the time of confinement, and this probably is the time to which the observation is meant to apply. Yet there may have been a deficiency in the early months, although at the end of the pregnancy there was no evidence of such.

The theory that club-foot is due to primary malposition of the tarsal bones is now generally regarded as exploded, the malposition and formation being regarded as secondary conditions, or the result and not the cause of the deformity.

It has been held by some that congenital and non-congenital talipes are analogous, and that the methods of production applicable to one form are applicable to the other, but there is no analogy. Non-congenital talipes is usually due to infantile paralysis, which has a clear and definite pathology—viz., degeneration of a variable number of nerve-cells in the anterior horns of the cord, with secondary degeneration of nerves and muscles connected therewith. The deformity is a direct result of paralysis, and the action of antagonistic muscles. Congenital talipes has no such pathology, there is no nerve-lesion and no muscular paralysis. Adams says:—"In congenital varus the muscles are usually healthy at the period of birth, but if the deformity be allowed to continue, their growth is impeded in a proportionate degree; the structural degeneration, however, does not take place to any considerable extent, even when the deformity has remained unrelieved up to the adult period of life. The reverse is the case in the non-congenital form; here the fatty degeneration of the muscular tissue commences as an early change, and rapidly advances to an extreme degree. The muscles in the congenital can usually be restored to the influence of the will, but in non-congenital spasmodic cases only partially restored."

The most common form of congenital club-foot is varus, while the most common form of non-congenital is equinus. Adams estimates the frequency of equinus among the non-congenital cases as representing about one half of the total number. The muscles most prone to be affected by infantile paralysis are the extensors in front of the lower leg; and this, doubtless, contributes to the result; but, again, when the cause of the non-congenital deformity is spasm of the muscles of the leg, the larger amount of muscle in the calf must
necessarily overcome the lesser amount in front of the leg, and also contribute to the result. It is admitted that the disproportion between these sets of muscles is a determining factor in the production of non-congenital club-foot and the overwhelming preponderance of the equinus variety.

Turning to the congenital form, Adams gives the following table, showing the relative frequency of the several varieties:

<table>
<thead>
<tr>
<th>Congenital Talipes Varus,</th>
<th>688</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital talipes varus of one foot and valgus of the other in the same patient,</td>
<td>15</td>
</tr>
<tr>
<td>Congenital talipes valgus,</td>
<td>42</td>
</tr>
<tr>
<td>Congenital talipes calcaneus,</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total congenital forms</strong></td>
<td><strong>764</strong></td>
</tr>
</tbody>
</table>

It will be observed that in these 764 cases of congenital club-foot (taken from a report of the Royal Orthopedic Hospital) there is not one case of talipes equinus.

In fact, some writers deny that it occurs congenitally, and if the dynamic condition of the muscles is to be put forward as being a factor in the production of congenital talipes, then the results should be as consistent, at least as they are in the non-congenital forms, whereas evidence of such is conspicuous by its absence.

When contraction supervenes in cases of infantile paralysis, the deformity takes some months to form, but in Case III they were not only fully formed at the seventh month of intra-uterine life, but rigidly fixed, a condition which renders muscular paralysis an improbable cause, and suggests that they were formed early, or at least at a time when the muscles were only beginning to have the power of contracting.

The deformities presented by my cases are just those likely to be produced by compression. Moreover, the theory of a central or non-mechanical cause does not explain the symptoms of disorder manifested during the pregnancies. It is remarked sometimes, as an argument in favour of a central cause, that club-foot is often associated with spina-bifida; but in the 764 cases of congenital talipes already mentioned, only two of these had spina-bifida.

A case of spina-bifida recently came under my observation which presented deformities allied to those of Cases II and III. Both legs in this case were stiff and straight—that is, they could not be flexed at the knee joints, and both thighs were drawn up, from shortening of the psoas and iliacus
muscles, &c. While in utero, the legs had been bent up in front of the body, with the feet in the neighbourhood of the chin, and they tended to retain this attitude. Both feet were in the condition of talipes calcaneus, but were not exactly alike; moreover, the toes were distorted in an irregular manner, a condition evidently due to crushing. These deformities, although associated with spina-bifida, were doubtless due to mechanical causes.

The theory of arrested rotation or unwinding of the limbs, supported by Billroth, is limited in its application to the feet, and leaves the other deformities unexplained. Rotation is not supposed to occur in the upper extremities, and it would not explain the production of the deformities even if it did. The cause of the arrested rotation is also left unexplained. This must be something capable of affecting the upper as well as the lower extremities, and of producing retention and modification of the early foetal attitudes.

The presence normally during the early months of pregnancy of a very large proportion of liquor amnii is indicative of the greater necessity for the absence of restraint, which, if present, will readily act on the soft and rapidly growing structures, hindering their natural developmental movements, retaining their attitudes, or even distorting the more exposed parts of the foetus. The origin of the amniotic fluid is uncertain, and has probably different sources at different periods in the pregnancy. Certain it is that it varies greatly in quantity. Dry labour and dropsy of the amnion are well known conditions; and, although the latter is a supersecretion, it is at least evidence of the existence of a tendency to variability in the amount of the secretion, and may indicate the possibility of an opposite condition. The theory that club-foot is due to a deficiency of liquor meets with a difficulty—viz., that of explaining the maintenance of the foetal circulation under circumstances of pressure. To produce deformity or fixation of attitude it is not necessary that there should be an absence of liquor, and that the foetus should be firmly gripped; but only that the limbs, which naturally float freely in fluid, should be gently pressed and their movements restrained, and this amount of restraint is not incompatible with the maintenance of the circulation any more than in ordinary cases at the end of pregnancy, and especially in cases of dry labour the circulation is not obstructed by the compression or restraint that exists at such times. Moreover, in Case III, after the membranes had been ruptured and the liquor allowed to drain away, the child was for three days
retained in the uterus, and (although it did not survive) it was born alive. During these three days there was active restraint, yet the circulation was maintained.

It is sometimes remarked that, when the confinement is premature, there is greater liability to club-foot.

In Case III the deformities are found nearly two months earlier than in the previous case, and are more extensive; and, instead of being less perfectly formed, they are perhaps more so. This observation may be more correctly expressed by saying that club-foot pregnancies are liable to premature termination—a circumstance suggestive of disturbance of environment rather than disease of the foetus. Club-foot has often been found in the fourth month of intra-uterine life, a time when the muscles are only beginning to have the power of influencing the position of the limbs. Thoroughly established deformity, with alterations in the muscles, ligaments, and probably of the bones, does not suggest recent formation; and, if found so at the seventh month, then the time of formation is thrown back to the early months of pregnancy.

The position of the foetus in utero is one in which the spinal column is bent forwards, with the head flexed upon the sternum and the arms crossing each other in front of the chest. There is a considerable space in the angle between the head and the chest, where the hands, if they occupied this position, might escape intra-uterine pressure, if such there was, but the hands are usually about the level of the cheeks. The arms are flexed, and if pressure is applied at the sides of the foetus, the hands must be pressed upwards against the face. If they come in contact with each other or overlap, the natural tendency of the fingers to flex would be exaggerated. When I first saw the hands in Case II, I was struck with their appearance, and described them as crushed looking rather than contracted, and this before I had formed an opinion of the manner in which they had been produced. On each cheek in Case III there was an obvious thickened mark, and this unusual condition is difficult to explain, unless by presuming the hands to have been lying over the cheeks and producing the marks by compression. The slight hollows of the hands would correspond with the thickened parts of the cheeks. The fore-arms could not be extended beyond a right angle, and they would probably occupy a more flexed condition in utero, and this would correspond with the hands having been high up.

If the condition of the fingers depended on muscular spasm, a relationship would be expected between the deformities and
the muscular supply, but in Case II only the little, ring, and middle fingers were contracted and fixed, and in Case III, in the right hand, only the ring and middle fingers, and in the left all except the thumb were similarly affected. Some fingers were flexed and fixed, while others, owning the same supply, could be opened without any difficulty. In both cases the thumbs were unaffected, and this is what might be expected if the cause had been of a mechanical nature. The direction of the pressure would increase the flexion of the fingers, but would not influence the position of the thumbs, because of the lateral direction in which it would be applied.

The explanation of the feet being so pre-eminently the parts of the foetus liable to distortion may be that they are pre-eminently exposed to pressure, and a moderate degree of it will act on them when other parts escape.

Dr. Little quotes the opinion of Philip von Walther, who says:—"Talipes is a natural grade of the development of the foot, and embryos of three or four months frequently retain one or both feet in this state."

Eschricht has shown that, "at the commencement of their development, the lower extremities lie with their backs against the abdomen, the hollows of the knees being against the belly, so that during the early months the legs must rotate on their axes."

Berg (Glasgow Medical Journal, vol. xx, 1883) supports the theory of arrested development, and says:—"It is now a well-established fact that in early foetal life the sole of the foot is turned in. The normal rotation takes place gradually, and is mainly accomplished by the fourth month, but is not completed till the sixth month. This rotation is not due to muscular power, as it occurs at a time when there are no muscles; but, according to Kölliker, it is due to the process of growth of the parts. This position of the sole is due to the position of the limbs of the foetus at an early stage of its existence, the thighs being rotated outwards, so that the inner surface of the thigh and tibial border of the leg are pressed against the abdomen, the legs crossing each other at their middle and the limbs being bent at the knees. But in the growth of the foetus the lower extremities alter their position, the thighs are drawn inwards and rotate, so that the anterior surface lies against the abdomen, and the soles instead of the outer surface of the feet are presented against the uterine walls. During embryonic life a similar deformity (club-foot) is present so long as the leg has not yet completed its rotation."
A foetus of about eight or ten weeks, at present in my possession, shows very well this position of the limbs. They are rotated outwards, flexed and widely apart at the knees. The feet are approximated, extended, and the soles are turned inwards, and face each other. The legs also project somewhat behind, and might easily be affected by pressure.

If the natural movements of such limbs do not take place, the result can only be talipes, and talipes of the overwhelmingly prevalent type. If this is an arrest of development simply, the deformity should be nothing more than a permanence of the early foetal attitude, but when the sole of the foot looks backwards as well as inwards, as it usually does in congenital varus, there is something more than the early attitude, and this is left upprovided for by the theory of arrest.

There is sometimes evidence of incompleteness of the rotation of the limbs in cases of club-foot, but if it has taken place fully or in part, it seems necessary to seek some other explanation for the permanence affecting the feet only. In such, during the inward rotation of the limbs, the corresponding outward movement of the feet has probably been prevented by their prominent parts, the toes, having been in contact with an obstruction, and an obstruction, if it continued to act on the growing foot, would ultimately press the toes and fore-part of the foot backwards.

If a foot or limb is kept in an abnormal position, in which the action of one set of muscles is hindered, these will become less efficient; while their opponents, assisted in time by the secondary alterations in the rapidly growing structures, will tend to maintain the advantage. When the deformity has once been produced, the muscles, when they act, must have not only an advantage over their opponents, but perhaps also the altered direction of the tendons may be more effective in causing displacement of the bones.

During the latter part of pregnancy the foetus is more or less cramped and restrained, and bears evidence of such after birth; but, probably from the advanced stage of development and the greater power of movement, the effects are slight and ephemeral. Here, also, it is the feet that are mostly affected. The adult foot cannot be bent up, beyond forming a right angle with the leg, owing to the shape of the articulating surface of the astragalus; but the feet of new-born infants present a variety of conditions which may not amount to slight forms of club-foot, but are nevertheless evidence of pressure. The foot of a new-born infant can usually be
bent up further than the adult foot, and often so far that the dorsum can touch the front of the leg, and yet cannot be flexed much, if any, beyond the right angle, showing thus a degree of fixation, or a deviation from the natural range of movement. Often one foot can be more flexed than the other, but cannot be extended so far. I noticed in a recent confinement (twins), in which the liquor was abundant, that the feet were natural—that is, had the movements of the adult. In another case (single pregnancy) there was a very large amount of liquor, causing extreme distention, in which the uterine contractions were, in consequence, feeble, and the labour protracted, and where I had at length to rupture the membranes to induce stronger contractions. A large amount of liquor escaped and had to be received in a basin. This was a case of protracted labour from excess of liquor; and here the child's feet were well formed, and could not be over extended, or bent up towards the front of the leg. The feet could not have been crushed in this case, and the usual evidence of such is wanting. Again, in other cases where the liquor has been scanty, the feet have been severely bent up, giving the downward projecting heels a pointed appearance.

A slight degree of talipes varus is said to be common at birth, and this I have often seen. The early foetal position, and a condition common at birth—viz., the outward curving of the lower legs, may explain this. The majority of children at birth show indications of the application of intra-uterine pressure during the latter part of pregnancy, even when the uterine conditions are normal, but there is also evidence of relationship between such and the amount of liquor amnii. The foot is usually pressed upwards, and thus it differs in its direction from club-foot in its prevailing form; but towards the end of pregnancy the early foetal attitude which disposed to varus will have given place to one in which the foot will be situated more at right angles to the leg. Drs. Adams and Little recognise slight forms of varus due to pressure and position acting towards the end of pregnancy, and associated perhaps with scantiness of liquor.

The following case came under my observation some time ago. I attended Mrs. S. in her confinement in July, 1889. There was almost no liquor amnii, and the child, which was exceptionally large, had double talipes varus, but the feet were not rigidly fixed, and could be twisted into their proper position. The soles of the feet looked inwards, backwards, and downwards. The inner edges of the feet were raised,
the left being worse than the right, and here the border looked upwards and formed a right angle with the tibia.

The mother says the fetal movements were painful during the last three months. This, along with the scantiness of liquor and the great size of the child, suggests that there has been intra-uterine compression, and that to this is due the deformity of the feet. The legs were somewhat stiff, and the mother remarked that the left hand was the same, and that the child did not use it much for some time after it was born.

The following case of talipes valgus also came under my observation recently:—I assisted a brother practitioner with a difficult confinement case in which the presentation was abnormal. After chloroform had been administered, the os was dilated, and the membranes ruptured, when a large quantity of liquor escaped. The hands and feet were then found to be presenting, and the buttocks seemed to rest on an iliac fossa. A foot was brought down and the woman delivered. The left foot of this child was bent outwards, the outer edge raised, and the inner depressed, and quite straight. It could be bent into better position, but at once relapsed when let go. The condition was one of talipes valgus, but without a severe degree of fixation. There can be little doubt that this case was due to intra-uterine malposition.

There is, then, evidence of intra-uterine pressure producing modifications of the foetus, and affecting usually the feet. These pressure effects, beginning in slight ephemeral forms, pass into undoubted cases of club-foot. If late pressure admittedly causes deformities, then it is not impossible, if somewhat similar conditions existed early in pregnancy, that similar results might be produced, and the earlier the date the severer the result; for, if there is an early cramped position, this will probably pass into the cramped position common at the end of pregnancy, and thus establish a continuity of pressure. The simpler and less severe results may illustrate the method of production of the severe.

Mr. F. Churchill (British Medical Journal, 27th November, 1886) says, "I believe we shall find that intra-uterine pressure, by limiting the growth and development of the limbs, constitutes the primary and provocative cause for the appearance of this deformity. It is not possible to infer that some reflex irritation of the uterine branches of the hypogastric plexus, distributed over the surface of the uterus, was sufficient to keep up a spasmodic contraction or tension of the uterine muscle, so as to abnormally confine or limit the movements of the
retained foetus during its growth and development?" Such a theory might be urged as being applicable to my cases, but it is improbable that pressure could influence the foetus if the liquor was present in its normal amount, and especially so during the first half of pregnancy, when the amount is relatively large.

Children at birth are singularly free from disease, when compared with the same children a few months old, and intra-uterine existence may be one of comparative immunity from disease; yet club-foot has been found in the third month, and several times in the fourth or fifth months, and thus to suppose the cause of club-foot to be of a central nature, is to suppose the imperfectly developed nervous system of an embryo or foetus liable to some disorder which is capable of producing peripheral deformity.

The mother can hardly be believed to affect the foetus except through changes in the blood, yet emotion or fright is said to be productive of an influence on the foetus, but it is more likely to have an influence on the uterus itself than to act primarily on the foetus. The arrival of the doctor in confinement cases is often followed by cessation of the uterine contractions, and a proposal to use the midwifery forceps is sometimes sufficient to hasten the completion of labour.

Parker tabulates various ways in which talipes may be produced from mechanical causes, and some of these are independent of the amount of liquor. He also remarks—

"The presence of areas of atrophied skin with bursæ beneath, situated over the most prominent parts of the exposed aspects of the feet, confirm the view that the deformity is a condition enforced by the mechanical action of the environment."

There is, I submit, more positive evidence in favour of the production of club-foot from mechanical causes than in favour of a central origin. The intra-uterine conditions are capable of producing modifications of the normal foetal attitudes, as seen in the late pressure effects, and these show a relationship to the amount of liquor amnii.

Continued fixation of a part with splints produces a condition of rigidity and a permanence of the retained attitude. The ligaments are at least as active in maintaining the deformity of club-foot as the muscles, and if the latter were the sole agents in its production we would expect to find less uniformity in the alterations of the structures, less general fixation, less evidence of an enduring cause, or a condition of matters resembling the non-congenital deformity.

The theory of arrested rotation or unwinding of the limbs
is a very important advance in our knowledge of the production of club-foot. The cause of the arrest is unknown, but my experience disposes me to favour the idea that this is of a mechanical nature.

It is held by some authorities that pressure or want of space is the cause of other malformations, such as acrania, unclosed thorax, unclosed abdomen, &c. In support of this it is stated that the head fold of the amnion is sometimes found, in acrania, adhering to the structures that take the place of the undeveloped vault of the cranium, suggesting the probability that want of space has prevented the growth of the foetus at this part. General want of space is held to account for the other malformations that usually accompany acrania. In the case of spina bifida with deformity of the legs, which I have recorded, there is reason to believe that here there has been want of space, or pressure, from some cause.

It may be admitted that my cases have an etiology which is of a mechanical nature, but that, nevertheless, they are exceptional. In Case I there were no symptoms of disorder during the pregnancy, and nothing to suggest the etiology of the deformity. As the case was one presenting an example of the most common form of club-foot, the conditions necessary to produce this deformity, while probably of the same nature as those present in the other cases, might not have been sufficiently severe to manifest their existence by symptoms of disorder during the pregnancy. Moreover, this case points to the probability of these unusual symptoms being absent in ordinary club-foot pregnancies.

My cases present, then, three examples of the most common form of club-foot occurring consecutively, and associated, in Cases II and III, with other deformities of a similar nature concerning the etiology of which there can be little doubt; and I think I may fairly claim for Case I an etiology of the same kind.

THE EXAMINATION OF THE EYE.

BY FREELAND FERGUS, M.B.,
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(Continued from p. 110.)

We come now to discuss the testing of astigmatism by means of trial glasses and test types. If a patient's accommodation be at all active, this is perhaps one of the least
satisfactory methods of estimating astigmatism. We believe that in certain cases the accommodation may so act on the lens as in great measure to correct a corneal astigmatism. Hence the patient having always been in the habit of making this correction, when using the eyes for accurate vision does not readily give it up, so as to let the lenses return to their normal condition. Thus there may be considerable astigmatism when there is only a little or none manifest. When a patient, on the other hand, is examined in a dark room, and the sight used not for seeing accurately an object, but merely for fixation, then the accommodation is not so likely to be disturbed. For the rapid diagnosis of astigmatism, both as to its nature and approximate amount, we know of no methods superior to the direct examination and to the

shadow test. For the mere diagnosis of astigmatism probably the indirect examination and the use of an ophthalmometer are the most rapid.

Still we must not be supposed to underestimate the value of the test by trial glasses and test types, or, as it is sometimes called, the subjective test. We always use it in every case as confirmatory of results got by other methods; we should, however, be sorry to trust to it alone. The letter types are not those which we use in the first instance for this test. We invariably use—and we think it to be the best we have seen—what is often called Snellen's, rising sun, of which we give a reproduction on a very small scale in Fig. 17. The real size of the test card is 38½ inches wide by 24½ inches high. Like the test type for testing hypermetropia and
myopia, this card ought to be placed at a distance of at least 20 feet from the patient. All subjective testing ought to be done with the test objects at such a distance from the patient that the light entering his eye consists practically of parallel rays. If the distance is less than this, then we are more likely to be disturbed by the accommodation. Hence results obtained by the way in which a patient sees the hours of a watch, or radiating lines held in the hand, are, except in cases of myopic astigmatism, most unreliable.

There are several facts which we ascertain while testing a patient with trial glasses for hypermetropia or myopia which cause us to suspect that the patient is astigmatic; thus, if in a row of letters, some are recognised while others of equal size are not; if, again, a patient sees indistinctly, or confuses certain letters of one row, but sees fairly well some of the letters of a smaller row; sometimes, also, when the astigmatism is not either in the directly vertical or horizontal meridians, the patient twists the head a little to one side in reading.

On placing the patient before Snellen's radiating lines, we ask if they are all nearly equally distinct; we further ascertain if the patient can see, in any of the groups of three lines, the division into three, right to the very points. If he cannot, we ascertain if he can see the separation into three in any group nearer to the points than he can see it in others. Now, suppose he can distinguish one group to the very end, and that those on either hand of it are clearer than any others except the one which he sees to the end, we are not to presume that that group corresponds to one of the principal meridians of the cornea. No doubt it may do so, but then it is possible that in a case of mixed astigmatism, where one of the principal meridians is myopic, and the other hypermetropic, that this group corresponds with an emmetropic meridian somewhere between these two extremes. Of course, as we have seen in our last paper, the direction occupied by this particular set of lines is at right angles to the direction of the corresponding meridian. We prefer using spherical glasses in the first instance for subjective testing, only using cylinders after we have an approximate estimation of the astigmatism. We begin by putting the weaker numbers of the convex series into a trial frame in front of the patient's eye. Let us suppose that in a given case the patient could see the group marked 80 to the very end, while he could only distinguish clearly the numbers of the group marked 2 as separate lines for one-half their course, and that on placing a spherical + 1
in front of his eye that it made the points of those which had been distinct before, indistinct, and rather improved those marked 2 or a group very near it—\( i.e. \), allowed the patient to see them as distinct lines nearer to their points—then we would infer that we were dealing with a case of manifest simple hypermetropic astigmatism. If, on the other hand, it had not improved the 2 group in the least, and had made the 80 group indistinct, but had improved some other, say the 30, 40, or 50 group, we would have suspected mixed astigmatism. As it is, however, in this case we find that \(+1 \text{ D}\) improves the 2 group or one near it. We then go on with the convex series till we get the strongest convex spherical with which the patient can see this set of lines to the end, or till we get the strongest convex with which he can see these lines nearest to the end. Let this glass be \(+2.5\). We take this glass out of the frame, and substitute for it the cylindrical glass \(+2.5\) with the axis in the direction of the set of lines which the spherical improved. The patient should now try how he can read the distant letters with this glass. If he reads them all, then the surgeon may feel satisfied that he has corrected the patient's manifest astigmatism. If he does not, then weaker and stronger cylinders may be tried as also may slight alterations of the axis. If even then the patient's vision is not equal to \(\frac{2}{5}\), the possibility of an amblyopia must be taken into account.

Again, let us suppose we are dealing with a case of compound hypermetropic astigmatism. Having first diagnosed that it is such a case, either by the shadow test or by the direct method, we would proceed to check our results as follows:—We would find out which set of lines the patient sees most distinctly. These would, in all probability, be in the direction at right angles to the meridian of maximum refraction. We would find out with which spherical glass he sees them best. That would be an indication of the manifest hypermetropia in the meridian of maximum refraction. Let this glass be \(+2 \text{ D}\). We would then with spherical glasses correct a meridian at right angles or nearly so to this one. Say, that with \(+5 \text{ D}\) the patient sees a set of lines at right angles to those he saw with the \(+2 \text{ D}\) right to the very end; but that with \(+5.5 \text{ D}\) they are less distinct, there the manifest ametropia is corrected by \(S + 2 = cly + 3\), the astigmatism in this case being \(3 \text{ D}\). We would, as before, try the patient's visual acuteness for the letters with this combination. If it is good we would rest satisfied, but if not, then we would, as before, try the effect of altering the
cylindrical and spherical elements, and also try the effect of slightly altering the axis of the cylinder.

Our method of procedure in estimating subjectively the amount of myopic astigmatism, simple or compound, or of mixed astigmatism, is precisely similar to that just described for the examination of hypermetropia. The only difference is that, whereas, in dealing with convex glasses, we take the strongest, which gives the best result for a particular set of lines, in working with concaves we take the weakest. In all cases we make the diagnosis first with the direct test and the shadow test, and then get a result with the trial glasses.

Of recent years many ophthalmologists have been using some form or other of ophthalmometer. For the last year or so we have used Javal's in our private practice. We have notes of nearly a hundred cases measured with it. Like other ophthalmometers it simplifies work enormously. It gives at once the directions of the meridians of maximum and minimum curvature, and gives approximately the difference in dioptries between these meridians.*

There is another question of considerable practical importance, and that is as to the use of mydriatics when testing astigmatism. No general rule can be laid down for this, but we would say that the vast majority of cases can be measured perfectly well, if the surgeon is a competent examiner, without them. Still, cases do from time to time occur in which no good examination can be made without their aid. Thus, if in any case the results of the subjective and objective tests are absolutely at variance, then they ought to be employed. Lately we saw a case of undoubtedly astigmatism in both eyes. The examination of the right eye by the ophthalmometer, by the shadow test, and by the direct method showed clearly that the patient had a hypermetropic astigmatism, and that the meridian of minimum refraction was nearly horizontal—i.e., the axis of the correcting cylinder should be nearly vertical. We found, however, that the position of the axis which gave best vision was not vertical, but nearly horizontal. Obviously there was here a great discrepancy. The eye was put well under the influence of homatropine, and on re-testing we found that the best vision was with the axis nearly vertical.

We believe, generally speaking, that something far short

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* Mr. Story, of Dublin, has recently in the *Ophthalmic Review* given us a record of 139 observations made with a similar ophthalmometer to the one we use. He speaks very highly in favour of it, as do also the large majority of oculists who have tried it.
of absolute paralysis of the accommodation suffices for these examinations. Hence we use homatropine. A few drops of a 2-grain to the ounce solution, put into the inferior cul-de-
sac twice or thrice before measuring, usually relieves the accommodation to such an extent as to make examination possible. In a few obstinate cases we may even have to use atropine. Where mydriatics are used, so as to cause paralysis, a note should be made of the glasses found to be suitable, and then, when the eyes have partially recovered from the extreme mydriasis, the glasses may be tried, and, if still found suitable, ordered. If the accommodation has been acting in an abnormal manner before the mydriasis is induced, it always tends to do so after the mydriasis has passed off. Very frequently, in such circumstances, the glasses when first worn do not give the patient the relief which he expects, nor do they materially improve his vision. Gradually, however, as with their use the accommodation returns to its normal condition, the glasses begin to suit the patient better. If after the lapse of some time the patient is not more satisfied with them, then it is likely that the measurement has been wrong, either as regards the amount of ametropia or in the direction of the axis of the cylinder.

In the preceding pages we have on several occasions insisted on the necessity of having the glass behind the ophthalmoscope in the direct method, and the one in front of the patient’s eye in retinoscopy, as nearly as possible at the same distance from the patient’s cornea as spectacle lenses are usually worn. In the weaker degrees of ametropia this is not a matter of great moment, but if the precaution is neglected it may lead to serious error in the higher.

Take, for example, the hypermetropic eye. From previous papers we have seen that before parallel rays of light are brought to a focus in the retina they must be made to converge, as it were, before entering the eye. The amount of such convergence depends on the amount of hypermetropia. Thus, if the hypermetropia is 2 D, the rays must be made to converge, as it were, to a point 50 centimetres behind the cornea—i.e., to 500 millimetres. If, however, the glass which causes this convergence is placed at 20 millimetres in front of the eye—i.e., about three-quarters of an inch—then the rays must converge on leaving the glass, not to 500 millimetres, but to 520. Therefore, in the first case, when the correcting glass coincides with the cornea, the hypermetropia is corrected by a glass \( \frac{1000}{200} = 2 \) D; in the second, it is corrected by a glass \( \frac{1000}{200} = 1.9 \) D. In this case there is very little
difference between the correcting lens and the amount of hypermetropia. A very different state of matters, however, obtains for the higher degrees of hypermetropia. Suppose that after a cataract extraction we have, from the absence of the lens (aphakia), a hypermetropia equal to 10 dioptres that is corrected by a lens of 100 millimetres. Let us also suppose that this is the correction were the lens to coincide with the cornea. If, however, the correcting lens is not at the cornea, but at the point generally occupied by a spectacle glass—say 20 millimetres from the cornea—then the focal length of the required lens is not 100 millimetres, but 120; or, to put it in other words, instead of a glass of 10 D, one of 8 D suffices.

In the case of myopia, on the other hand, the tendency is quite the reverse, as is apparent from the following example:—A patient has 6 D of myopia in one eye—i.e., his remote point of distinct vision is at 166 millimetres from his eye. If we consider the correcting lens as coinciding with the cornea, then a glass of 6 D is required to give parallel lines the necessary divergence; but if the lens is held at 20 millimetres in front of the eye, then the required glass is that one which will cause parallel lines to diverge as if they came from the patient's far point of distinct vision. But that point is only $166 - 20 = 146$ millimetres from the new position of the concave lens. Hence a glass of 146 millimetres focal length is the proper correction, i.e., very nearly 7 D. In the higher powers of myopia still greater differences will be found between the actual myopia and the glass which corrects it at the distance at which spectacles are generally worn by patients.

Two other points are, in our opinion, of sufficient importance to merit some slight discussion, even in elementary papers of this kind—we refer to the diagnosis of ametropia by the indirect method of opthalmoscopic examination, and to certain peculiarities in the movements of the shadow. No doubt the indirect method for mere diagnosis of ametropia is of great value, and it has been used, as we have already seen, by Schmidt-Rimpler as a general method of measuring ametropia. We only use it, however, for the estimation of myopia, and that not invariably; still, in the higher degrees of short sightedness, there are few better means of diagnosing the defect.

One fact is of special importance—viz., that if the optic disc in any eye appears oval in one direction by the direct method, and in another by the indirect, then there is no
doubt of the existence of astigmatism. The following passage, quoted from Loring, gives the explanation of this phenomenon:—"If we make, for example, a small cross, the arms of which are of equal length, and view it through a common convex glass, say of 3 inches focal distance (12 D), it appears enlarged, but equally in both directions, as the magnifying power is the same for each arm. If we now add, however, a convex cylinder glass (6 D) to the spherical, we increase the magnifying power in one principal direction without altering it in the other. The lens is, therefore, equal in one direction to 12 D, but in the other to 12 D + 6 D = 18 D. If we now turn the glass in such a way that the strongest magnifying power shall correspond with the vertical arm of the cross, this will be more enlarged than the horizontal, which is seen through a weaker power, and will consequently appear longer. If we now draw a circle round the arms of the cross in such a way that these shall be the radii, the effect will still be the same, and the circle will appear elongated in the vertical direction, because it is more magnified in that direction; consequently it will appear no longer a circle, but an oval.

"If, however, we now take a second lens and hold it in the other hand at a certain distance in front of the lens, just as done in the indirect method with the ophthalmoscope, then we get an inverted image of the cross and circle round it, elongated no longer in the vertical but in the horizontal position. The reason of this is that the rays passing through the first lens, whose principal meridians are of different focal power, are refracted unequally, those passing through the vertical meridian where the lens is of 2 inches focal power, more than those passing through the horizontal where it has only 3 inches. As the rays passing through the vertical meridian are more refracted by the first lens, they will, after passing through the second, come to a focus sooner behind it; and the nearer the rays meet behind a lens the smaller is the image, consequently the vertical line of the cross will now appear smaller than the horizontal, and the circle will now be elongated horizontally."

Another point of diagnostic importance is as to variations in the size of the inverted image. Thus, if with a fundus well focussed by the indirect methods, we bring the inverting glass nearer to ourself, then, if the image does not alter in size, that eye is practically emmetropic. On bringing the lens nearer to us, however, various changes in the size of the picture of the fundus may take place. Thus, the nearer we bring the glass the smaller may be the size of the inverted image. In
this case we have to deal with hypermetropia. By watching
the diminution in size, a very expert examiner is able to
diagnose the presence of astigmatism, for the various meridians
do not contract equally, but irregularly—the one corresponding
to the more hypermetropic principal meridian diminishing
more rapidly and to a greater extent than the other.

Again, in myopia, as we bring the inverting glass nearer
to us, the image of the fundus increases in size, provided that
we do not bring the inverting lens nearer than the punctum
remotum. By differences in the rate of increase between
two diameters of the optic disc and in its amount we may
diagnose the presence of astigmatism. These methods are of
use as evidences of astigmatism, but cannot be used for its
measurement.

When using the shadow test a careful observer will notice
certain important features. Thus, the rate of movement of
the light in the eye is not the same for all eyes. The more
nearly the eye approaches emmetropia the quicker is the
movement. Again, there are variations in the intensity of
the light in the eye and in the shape of its border. For
reasons which we do not stop to explain, the more brilliant
the light and the straighter its margin, the more nearly is
the eye enmetropic. This depends on the light being more
accurately focussed on the emmetropic fundus.

Another method of estimating errors of refraction is based
on Scheiner's well known experiment. For details as to this
test we refer the student to Dr. Thomson in the Transactions
of the American Ophthalmological Society, 1870 and 1873.
It is a method of which we have no practical experience,
although a few experiments which we have made with it
seemed highly satisfactory.

With this we conclude all that we have to say on the
testing of refraction. We are aware that our treatment
of this important subject has been popular, but we believe
that it is clinically exact, and will stand the practitioner
in good stead. For a more scientific discussion of the subject,
we would refer the reader to Landolt's well known book; a
very good exposition of the theory of refraction is also to be
had in Dr. Berry's book.

In our next paper we shall begin the study of convergence
and its errors—one of the most important chapters in the
whole range of ophthalmology.
A CASE OF CHLORAL RASH SIMULATING MEASLES.

By GEO. S. MIDDLETON, M.A., M.D.

Various drugs are known to give rise to skin eruptions, to which the term dermatitis medicamentosa has been applied. Among these chloral is credited with occasionally causing "a scarlatinoid or urticarial eruption, dusky red in colour, somewhat itchy, occurring especially about the face, neck, and extremities." The case recorded below is the only one of the kind that has come under my observation, and is all the more worthy of record that it was with some difficulty that we made a diagnosis from measles, which it closely resembled.

Jessie D., 8½ years old, was admitted to the Royal Hospital for Sick Children, on 9th April, suffering from chorea. It was a second attack, the first having occurred three years before, and though it had been noticed only eleven days, it had already involved the face and tongue, all the limbs, and many of the muscles of the trunk, and the movements were so severe that they seriously interfered with deglutition and respiration, and almost prevented sleep.

On the day of admission, with a view to controlling the movements and inducing sleep, the house physician ordered chloral to be given in 5-grain doses about every two hours, if required. On 9th April she therefore had 20 grains; on the 10th, 11th, and 12th, 45 grains; on the 13th, 50 grains; on the 14th, 45 grains; on the 15th, 25 grains; on the 16th, 50 grains; and on the 17th, 25 grains—in all, 350 grains in nine days. When I first saw her on the 13th April, she seemed to have benefited somewhat from the treatment, without being in the least narcotised by the drug, and it was therefore continued; but, as time passed on, it was apparent that the chloral had in reality little control over the movements. When the chloral was discontinued on the 17th April the spasmodic movements were of an extremely severe type, and the general condition was very unfavourable, little sleep being obtained, feeding being performed with some difficulty, the tongue coated with a thick white fur, and the lips and tongue covered with sordes.

On the morning of 17th April the nurse observed her face "flushed," and at his visit to the ward the resident physician discovered that the flush was in reality a rash. On the afternoon of that day I found that the face presented a bright red
hue all over, with the exceptions that around the alae of the
nose and immediately below the nares a patch of normal
skin was visible, and that the rash did not extend nearer than
half an inch to the hairy scalp. The skin involved was
infiltrated, giving the face a swollen appearance, feeling some-
what hard, and also rather rough, but without papules. The
arms presented a rash extremely like that of measles, of a
dull red colour, patchy, somewhat elevated, and papular. It
was most abundant on the extensor surfaces and about the
elbows. At this time the hands were free from rash. A
somewhat similar patch of measles eruption was noted at
the lower part of the right side of the thorax. The legs were
not involved.

Next day the rash had made progress. The skin of the
face was more dusky in colour, and more infiltrated and harder
to the hand, and had begun to show some slight indications of
cracking. On the arms the rash was now confluent, and only
here and there at the advancing margins were any mealy
patches visible. On the trunk the rash had extended, and
eruption was now commencing on the legs in the same patchy,
measly form that had occurred at an earlier stage on the arms.

Two days later the hands and the feet were involved, the
rash showing through the palms and the soles as somewhat
livid red spots.

On the fifth day the rash on the face had entirely lost its
brilliant red colour. The face was still swollen, and the
skin rough and tense, but all over the chin and the lower
parts of the cheeks there was deep cracking, but without
discharge. The rash on the arms had now largely dis-
appeared, leaving behind a somewhat scaly condition of the
skin. Over the trunk and legs there was still an abundant
rash, the greater part of the trunk being covered with a
confluent eruption, the patchy condition being observable
here and there at the margins. The colour was dusky livid,
disappearing only to a slight extent on pressure. The rash
on the trunk and limbs was not associated with such a degree
of infiltration of the skin as occurred on the face, so that
there was no considerable swelling of the parts involved. It
is also to be noted that, so far as could be ascertained, there
was no itching anywhere. By this time (21st April) the
patient's general condition had improved greatly, the tongue
had cleaned, and sordes disappeared, but the choreic move-
ments continued severe.

Thereafter the rash gradually faded, leaving behind it for
a time some patchy staining on the abdomen and legs. The
cracking of the skin of the face remained visible for a considerable time, but did not leave any definite cicatrization, although fine lines persisted for several months, indicating the site of the deeper fissures.

When the rash was first observed, its appearance at once suggested measles, all the more so that the temperature had run up from normal to 102°. But there were none of the ordinary symptoms of measles, no suffusion of the eyes, no nasal catarrh or sneezing, and no cough. The distribution of the rash on the face, its colour, and the amount of infiltration, though by no means inconsistent with that diagnosis, rendered it less probable; and as chloral was known to give rise to some curious skin eruptions, we suspended our diagnosis, and did not send the child to the fever hospital. The progress of the case, and the complete immunity of the other children in the ward, many of whom had not had measles, satisfied us that we were not dealing with measles, and in the absence of any other explanation, I think we are justified in referring this dermatitis to the administration of the chloral, which, it must be admitted, was given in large doses.

The ultimate result was satisfactory; the temperature varied from 101° to 103° from 17th April to 20th April, but as the acuteness of the inflammation passed off, the general condition improved, sleep was obtained, and the choreic movements rapidly subsided.

CASE OF COMPLETE OBSTRUCTION OF THE LEFT BRONCHUS BY A SOLUBLE FOREIGN BODY; SLOW BUT COMPLETE RECOVERY AFTER FIVE DAYS.

By DAVID NEWMAN, M.D.,
Surgeon, Throat Department, Glasgow Royal Infirmary; and Assistant Surgeon, Western Infirmary.

A child, M. B., aged 2½ years, was admitted into the Glasgow Royal Infirmary on the 19th November, 1890, suffering from dyspnœa, accompanied by noisy respiration. The child's aunt, who brought her to the Infirmary, stated that the child was playing with others on Tuesday, the 17th, when, about 6 o'clock at night, she observed that there was something peculiar in the breathing. The aunt said that "the child went into a kink, the breath almost leaving her, and she got
blue in the face." The history of the case was very difficult
to ascertain, and the child was too young to give any account
of its doings. On admission the child was very breathless—
respirations from 30 to 35 per minute—but no cough. With
each inspiration the chin and lower part of the mouth were
depressed, but the larynx did not alter its position either
during inspiration or expiration. The movements of the
chest wall were very characteristic of obstruction to one
bronchial tube—namely, the left bronchus. On the left side,
during inspiration, the sternum and left costal cartilages were
drawn forcibly backwards and upwards, so that a deep hollow
was formed to the left of the middle line. Posteriorly, on the
left side, the ribs were stationary, or practically so, during
respiration. With each inspiration there was a deep hollow
formed above and below the left clavicle, and the skin over
the suprasternal notch was sucked down. On the right side
the movements of the chest wall were normal, or perhaps
rather exaggerated. On auscultation it was found that there
was slightly exaggerated puerile breathing on the right side,
while on the left the respiratory murmur was replaced by a
slight whiff during expiration; but during inspiration no
sound was heard. The pulse was 140, and it was observed
that during inspiration pulsation of the radial artery was
diminished in volume, so as to be just perceptible, while
during expiration, and in the intervals between the two
respiratory acts, its volume was increased. The respirations
were quite regular, except upon two occasions, when the child
was seized with spasmodic dyspnoea, which lasted for about
a minute. The breathing was most oppressive when the child
was lying upon her back, and most easy when she was reclin-
ing on the left side. During the night of the 19th and till
the evening of the 21st the child had considerable difficulty in
breathing, which caused her to toss about in bed and change
her position every few minutes. On the morning of the 22nd
a considerable improvement was noticed, and on inquiry the
nurse stated that she had been steadily and rapidly improv-
ing since late in the previous night. There was nothing
coughed up in the way of a foreign body, and the relief
in the respirations was at first so gradual that improvement
could only be noticed by comparing the condition from day
to day. The entrance of air into the left lung was still
imperfect, and there was slight retraction of the chest wall
in front; but, as contrasted with the condition on admission,
there was marked improvement, and on auscultation the
respiratory murmur was heard all over the left lung. By
the evening of the 22nd the breathing was perfect on both sides of the chest, and all evidence of the presence of a foreign body had disappeared.

Remarks.—When I saw the patient for the first time it was perfectly evident that the left bronchus was almost completely obstructed by a foreign body, but from what my assistant and the nurse told me, the obstruction was more marked when the child was admitted. This improvement seemed to me to be explained only by the supposition that the foreign body was soluble, and had diminished in bulk since it became impacted. I therefore resolved to let the case alone and wait the course of events, with the instruction to Dr. Gray, my House Surgeon, to send for me at once should spasm of the larynx set in, and, if necessary, to perform tracheotomy himself. From the history of the case we had no knowledge of the nature of the substance inspired, so that it was only a matter of surmise, on my part, that the foreign body was a sweetmeat. The future history, however, I think, proved the conjecture to be correct. When substances—such as dried peas, beans, and other seeds—are carried into the air passages they soon germinate, and increase considerably in bulk, so that the obstruction to the entrance of air steadily increases; and other articles—such as shot, pebbles, stones, beads—by reason of their hardness and weight may, if the erect posture be kept, descend into the smaller bronchial divisions. It has therefore become a rule for the surgeon, as soon as he is certain that a foreign body has been retained, to open the trachea, and, without delay, attempt to remove the impacted article. In the case just recorded it was very evident that when the patient was first seen air was admitted to the right lung only, but within a short time the obstruction in the left bronchus somewhat diminished, showing that the foreign body was neither a seed nor a hard, insoluble substance, but rather an article capable of being dissolved by the bronchial secretions. I therefore considered myself justified in leaving the case alone, and trusting to the unaided efforts of nature to expel the extraneous substance, but at the same time the condition of the patient was most carefully watched, so that, should any sudden danger arise, it might be met by prompt treatment.
"THE SUPPOSED CURATIVE EFFECT OF OPERATIONS PER SE." *

BY A. ERNEST MAYLARD, B.S.

Of something more than passing interest is a paper by Professor J. William White, of Philadelphia, which has recently appeared in the August and September numbers of the Annals of Surgery. The subject of the paper is, perhaps, best conveyed in the author's own opening remarks. He says: — "For some time I have had the idea of collecting and analysing the various cases recorded in the journals and elsewhere, in which intelligent surgeons, having operated for the relief of symptoms depending upon a supposed pathological basis, have found no such condition, and yet the patient recovered, not only from the operation, but from the original ailment." The author then passes on to consider—first, the recorded cases, and, secondly, the possible explanation of the phenomena observed.

There can be but few surgeons who have not, in the course of their experience, had cases which recall results similar to many that are referred to here. To operate and find nothing, and yet the patient to be relieved of his symptoms, is sometimes strange enough; but, more mysterious still, are those cases where something is found, and where the surgeon honestly feels that nothing that he did seems sufficient to explain the cure that has been effected. After reading such a paper as that here referred to, the temptation almost lingers in the surgeon's mind that no protracted case, either obscure in its symptoms, or even obvious in its signs, should be allowed to pass without some tentative surgical measure. There is something as mysterious almost in contemplating many of these results as there is in considering the cases which are now said to result from the therapeutical use of hypnotism. It is, of course, quite possible that many results obtained in both cases are effected through similar internal agencies, and with this Professor White deals more extensively later. But the difficulty of explanation can hardly be said to be easier in the one case than in the other. For while certainly the distance between cause and effect seems often far enough in hypnotism, it cannot be said to be any closer in cases

* Annals of Surgery, August and September, 1891.
where one epileptic is cured by castration and another by
tracheotomy.

The major part of the first portion of Professor White's
paper (August number) is mainly taken up with a considera-
tion of these epileptic cases. From various sources the author has
collected 154 cases where operations were performed, and in
which little or nothing was found to account for the symptoms,
but either marked benefit or cure followed. The operations
performed were various. The larger proportion, however,
were cases of trephining; thus, in 56 cases where this operation
was performed, and nothing abnormal was found to account
for the symptoms, 25 were reported as cured, 18 as improved,
and only 3 showed signs of relapse later. It should be noted
that in nearly all these cases the cause of the fits had been
some injury to the head, although, from the tables given, it
also appears that some were idiopathic in character.

The operation of ligating large arteries, as the vertebrals
and the carotids, was performed in 30 cases, and, judging
again from the tables, these apparently were mostly of an
idiopathic character. Fourteen of these cases were reported
as cured, and 15 as improved. Castration was performed in
10 cases and tracheotomy in 9, and cures were effected in
each instance. Many other operations are given, both severe
and simple, and with results as difficult to explain as those
above indicated.

Following upon these epileptic cases is a series comprising
cases of abdominal and pelvic disorders. Of these, it may be
said that diseases of the most diverse character have been
relieved, if not cured, by apparently ineffectual operative
measures. Thus, we find simple laparotomy (i.e., nothing
more than opening the abdomen) performed with success
for tubercular peritonitis, pain in the stomach with persistent
vomiting, distressing renal symptoms, intestinal obstruction,
severe localised pelvic pain, supposed pyosalpinx, large fibroid
tumour of uterus, pelvic adhesions, obscure hepatic symptoms
with jaundice, and many other conditions. As a sub-division
of this class are operations upon the genito-urinary tract. Of
these, the most striking are operations for supposed kidney
calculus, where nothing has been found to account for the
symptoms, and yet the result of the operation has been their
entire disappearance.

In attempting to offer some reasonable explanation of the
phenomena observed in the above cases, Professor White
considers those conditions which were common to all, or nearly
all, of them. These were—
1. Anæsthesia.
2. Psychical influence, or so-called mental impressions.
3. Relief of tension.
4. Reflex action, or the "reaction of traumatism."
The first is briefly dismissed from the fact that it was tried experimentally on numerous cases with negative results.

In considering the second influence—that of psychical influence or mental impression—the author pertinently asks—"Is it possible, through influences acting upon the emotional or intellectual nature, to affect the organic processes of secretion, nutrition, &c., and, if so, is it conceivable that through the same influences pathological changes may be arrested and reparative or curative action established?" The reply he gives is in the affirmative. But its application as a complete and satisfactory explanation, in the present instance, is to some extent insufficient from the fact that it is impossible to make it—i.e., psychical influence, account for the curative effect of operations per se on imbeciles; that healthy-brained people should be influenced by operations is only reasonable to assume, as there is abundant evidence to show that they are affected by numerous other influences. In these purely psychical effects, then, there can be but little difference between the internal agencies brought into play to produce a cure, on the one hand, by a surgical operation, or, on the other, by the subjective influence of hypnotism; and any explanation which can be found to throw light on the one must similarly elucidate the mode of action of the other.

The third condition—relief of tension—can only be said to exist in certain of the recorded cases. Where tension has by operation been unquestionably relieved, it is quite reasonable to assume—as the author does—that such relief must be accompanied by other changes in the surrounding parts, and that these changes may result in a return of the parts to a normal condition. The only question which may fairly be asked here is—whether it is right to include such cases in the category of those especially under consideration. To relieve tension is a most common and important surgical procedure; and, where such relief entails a cure, the operation, however simple, must be considered in the light of any other well directed surgical measure. This theory, then, while it reasonably explains many apparently mysterious results, cannot be said to throw any light on the epileptic cures by trephining. Gowers appears to think that the good result obtained in these cases is due to the escape of pent-up serum; but the
escape of serum is but a rare concomitant, and if a cure result
where no such obvious cause of reduction of tension exists, it
can hardly be accepted as a likely explanation. A more
reasonable, although it must be confessed a by no means clear,
explanation is possibly to be found in the fourth condition
which the author describes—that of reflex action. Under
this head is included the "reaction of traumatism," as well as
the effects of revulsion and counter irritation. This theory is
based on the reciprocal influence which is frequently seen of
one portion of the body on another in both health and disease.
Thus the inexplicable relationship between mumps and orchitis
—between a burn and a duodenal ulcer. The one condition is
not unfrequently associated with the other, but what consti-
tutes the connecting link is an unsolved problem. So it
seems reasonable to suppose that the influence of an operation
on one part may so influence the pathological condition of
another as to bring about a curative result. To produce an
injury to cure an injury forcibly suggests to one's mind the
homeopathic dictum, Similia similibus curantur. In further
support of such an explanation, that certain unknown influ-
ences can bring about curative changes, the author adduces
cases reported by Drs. Gairdner and Coats and Sir James
Paget at the London Pathological Society in April, 1879.
These were cases of the disappearance of tumours, in some
instances of an undoubted cancerous nature.

While thus endeavouring to offer some explanation for the
otherwise inexplicable good results of an operation per se,
Professor White concludes with a caution regarding the
possible danger of considering as mysterious what really can
be accounted for by the operation itself. Thus, in many
abdominal operations, what is called a simple laparotomy may
unknowingly comprise in its performance manipulations which
may break down some slight adhesion or empty a pyo-salpinx
into the uterus, &c. But, with all precautions to exclude such
class of cases, there still remains a very large residuum which
must be relegated for the present to the realm of mystery.

Professor White has had an arduous task in collecting the
material which he has made such good use of; but the interest,
not to speak of the intrinsic value, which attaches to the
subject must have rendered it no unpleasant duty, and the
result will be highly appreciated by all who read his valuable
paper.
ON A CASE OF FATTY TUMOUR OF THE THIGH SIMULATING SARCOMA.

By GEORGE T. BEATSON, B.A. (CANTAB.), M.D. (EDIN.),
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The diagnosis of the circumscribed accumulations of fat known as lipomata or fatty tumours is generally an easy matter. Their soft, elastic, and almost fluctuant feel, their lobed, but circumscribed outline, their mobility and the slowness of their growth, with complete freedom from all signs of inflammation, render them easy of recognition. At times, however, conditions arise that may lead to an innocent tumour of this class being mistaken for one of a more serious nature, notably for a soft sarcoma, and as the following case is an instance in point, I have thought it might be of interest to place it on record:—It was that of a man, aged 64, a coal agent by occupation, who was admitted to Sir George Macleod's wards on 16th September of the present year, complaining of a large swelling on the posterior aspect of the right thigh, of from five to six months' duration, and which was not attributable to any cause that the patient knew of. His family history was satisfactory, especially on the point of the occurrence of any growths amongst near relatives, and his own personal history was that of a healthy man. It is true that for part of his life he had been a sailor, and on one or two occasions when abroad he had had attacks of "fever," but his health was in no way impaired. As far, too, as could be ascertained, he had always been a temperate man. His general appearance was that of a younger man than he stated himself to be, and his complexion, though sallow, was not in any way cachectic or suggestive of malignant disease.

The history that he gave of the growth, for which he had sought admission, was that "about six months ago" he noticed casually that his right thigh was larger than the left one, and that this was apparently due to a localised swelling at its posterior part. He had no pain or uneasiness in it, but he felt it inconveniencing him when he sat down. Up to this time he had been quite ignorant of the presence of any swelling of that part, and on this point he was very positive. Having become aware of it, he now directed attention to it, and for a time its increase was so slow that he
did not trouble himself about it, but during the last two months it had grown so rapidly that he became alarmed about it, and sought advice at the Dispensary of the Western Infirmary, where he saw Dr. Macartney, who advised him to enter the hospital. When questioned as to whether he could assign any cause for the swelling, the patient was inclined to attribute it to a fall in the street which he had about eight months previously, when, through his feet slipping, he fell in a sitting posture, hurting his buttocks. He also thought that his occupation of coal agent, which necessitated a very great deal of walking and climbing stairs, soliciting orders, might have had something to do with causing the growth, or, at any rate, of increasing it if it was due to the fall. As regards the effects of the swelling on the system, nothing definite could be made out. Patient thought he had begun to lose flesh a little, but evidently to no marked extent. He was sure, however, that it had weakened him, and that he was not able for so much work as he used to be, being more easily tired.

On patient's admission to hospital the following was the condition of the right thigh:—It measured at its most prominent point 22 inches, as compared with 18 inches at a corresponding point of the left. The superficial veins of the back of the limb, both in the thigh and leg, were highly varicose, a condition, however, that had been present for some years, though aggravated by the presence of the swelling. On inspection, the posterior part of the thigh in its upper part was evidently the seat of a considerable swelling, globular in shape, and having a large tortuous varicose vein coursing over it. It extended from just below the fold of the buttock to the junction of the middle and lower thirds of the limb. To the feel it was soft, smooth, and regular, and had a rounded shape. It was not painful on being handled, and was fairly movable, having clearly no connection with the bone. It was to some extent anchored down by attachment to the deeper structures of the limb, but it did not give the impression of being very firmly attached. It was not adherent to the skin over it, and on raising the latter from the tumour there was none of that dimpling or puckering of it which, arising as it does from the small fibrous processes which attach their capsules to the skin is so characteristic of fatty tumours.

Such, briefly, were the facts on which the diagnosis of the case had to be made. The first point that presented itself for consideration was whether the swelling was a new growth or a chronic abscess arising from the fall on the buttocks that patient had met with some eight months previously. There
was nothing in the history, symptoms, or situation of the swelling incompatible with this latter view, but its general appearance and characteristics rather inclined me to the idea of its being a neoplasm. It was too defined and globular for an abscess, and I felt that if it had its origin in the fall it would have declared itself from the very day of the accident in a more pronounced way than it had done. Assuming, then, that it was a tumour or mass of newly formed tissue with which we had to deal, what was its nature? Was it one of the _innocent_ connective tissue group, such as a fibroma or lipoma? or was it one of the _malignant_ class, such as the sarcomata? Its defined and encapsuled character, its soft consistency, and its comparative mobility were in favour of its being a lipoma, but its _rate_ of growth was very much against its being so. If there is anything characteristic of a fatty tumour it is its _slow and gradual increase_. No doubt some of the _diffuse_ lipomata grow with considerable rapidity, as I remember was very well seen in a congenital one that I removed by operation from the abdominal wall of a child about 6 months old, but their physical characters are quite unlike those presented by the present case, which was evidently encapsuled and clearly defined. Again, there was absent that dimpling and puckering of the surface of the tumour which is so evident when a lipoma is grasped by its base and raised from the subjacent parts, and which results from the traction on the bands of connective tissue running from the superficial fascia to the cutis and consequent protrusion between them of the fatty tissues. On these grounds I was led to the opinion that the case was one of quickly growing sarcoma of the thigh (associated, perhaps, with the injury received at the time of the fall), but that its defined character and position justified its removal. To this proposed method of treatment the patient consented, and the operation was done on 21st September, the anaesthetic used being ether. No difficulty was experienced in the operation, the tumour, _which lay under the deep fascia_, being encapsuled and easily shelling out from the bed of connective tissue in which it lay. It had practically no intimate connections with the deeper structures, save at one spot, where it was closely adherent to the semi-tendinosus muscle.

The following pathological report on the tumour was furnished by Dr. Coats, and was drawn up by Dr. Henry Rutherford:—The tumour removed is a smooth ovoid mass weighing about a pound and a half. It has a tense, elastic feeling, and is covered by a firm fibrous sheath, on opening
which a finely granular fat comes into view. It measures 7½ inches in length by 4½ inches in its greatest breadth. On making a medium longitudinal section of the central part, a length of about 2½ inches is found to have undergone transformation into a smooth, firm, greenish-yellow material, apparently necrotic. Microscopic examination of this central mass shows a considerable amount of granular matter between the fat cells, with not infrequent evidences of hemorrhages in the form of minute masses of blood corpuscles and diffuse brownish staining. The fat cells are in large part still quite clear, but in some cases are occupied by crystalline matter.

From the above report there was no doubt that the tumour, whatever its clinical aspects may have been, was an ordinary lipoma, and quite innocent. It was also made evident that the statement of the patient that the growth had only existed for some six months was incorrect. No doubt he only knew of its existence for that period, but the conditions revealed on section of it show that it must have been there for some years. Of course, its position was in favour of its escaping observation, and when discovered its rate of increase was probably only judged by the patient handling it. It is quite possible, too, that of late it may have taken on a fit of more rapid growth, and thus the patient's attention was more directed to it, but the case is only another instance in point of the great care required in eliciting from patients an account of their illness, and how, quite unintentionally, they may furnish one with a very misleading statement. Starting on the assumption that I had to deal with a very rapidly growing tumour, I was from the first biased in favour of its sarcomatous nature, and the further corroboration of the absence of all dimpling of the skin on traction of the tumour only confirmed me in this view. The explanation of the absence of this symptom was furnished by the position of the tumour. It was situated under the deep fascia of the limb, a very unusual position for a fatty tumour to occupy. All circumscribed lipomata lie, as a rule, above the superficial fascia, and, as was already pointed out, it is the bands of connective tissue passing from this structure to the skin which, if dragged on, give the surface of the tumour a dimpled appearance. When, as happened in this case, the lipoma is under the fascia, this symptom, of course, cannot be present.

The necrotic condition presented by the tumour in its centre calls for one or two remarks. It bears on the secondary changes to which fatty tumours are liable. As a rule these are not common. Occasionally they soften, and, undergoing
a kind of mucous degeneration, become quite fluid in their centre. At other times a species of calcification or even ossification is set up along with this liquefaction of the adipose tissue, and most hospital museums contain examples of large lipomas which contain central masses of apparently ossified and certainly calcareous material. Of course, in the present days of anaesthetics, such instances are less frequent, for such changes can only happen in tumours of considerable size and very long standing, and nowadays these are seldom met with, thus showing how the introduction of chloroform has influenced not only the domain of surgery, but has made itself felt also in that of pathology. The conditions described by Dr. Rutherford as existing in the centre of the tumour seem to me to be the early stage of this so-called calcification of a lipoma, a very good example of which, in its completed form, was furnished by a specimen of a "gigantic lipoma" of the thigh sent to Dr. Coats by Dr. A. Waddell of Kidderminster. This latter does not, of course, come anywhere near in size to that one of which a drawing is preserved in the Warren Anatomical Museum at Boston, the weight of which was estimated at 275 lbs., and which was much larger than the rest of the body of the unfortunate patient attached to it, but still its bulk was very considerable. It was said to be the growth of 70 years, and weighed over 40 lbs. The femur passed through the inner side of the mass, yet was in no way incorporated with it, for it could be rotated to a certain extent. On palpating the tumour hard large bony masses could be felt at some little depth apparently, while on the external surface of the growth some reddened swellings, like the projections of an abscess, were to be seen. On cutting into these a considerable escape of more or less purulent matter took place, and access was obtained to the centre of the growth. Here it was found possible, by shelling and tearing, to turn out a mass with the consistence of hard clay, which, however, was not yet quite homogeneous, but retained a considerable amount of fibrous tissue in it, giving it cohesion. It is very probable that this hard central mass represents very typically the condition that the necrotic centre of the present tumour would eventually have arrived at, had no operative measures been undertaken and the patient's life been sufficiently prolonged.
ANEURYSM OF THE INNOMINATE ARTERY:
MACEWEN'S OPERATION;
FORMATION OF A STRATIFIED THROMBUS.

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As this case gave an opportunity of examining the parts post-
mortem, a few days after the introduction of needles according
to Macewen's method, it is thought of sufficient interest for
publication. The results must be regarded as highly favourable
to that operation. Although it was not successful in saving
the life of the patient, yet there were evidences of the forma-
tion of a bulky thrombus in the limited period which elapsed
between the operation and death. This result is so striking
as to induce the belief that the operation is likely to be of
great service, and to encourage surgeons in the early applica-
tion of this method of treatment.

D. Mc'L., aged 36, iron-fitter, was admitted on 30th July,
1891, into the Western Infirmary under the care of Dr. R. S.
Thomson, who has placed the clinical history of the case
(drawn up by the resident physician, Dr. J. S. Buchanan)
at our disposal.

From the age of 15 years the patient has worked in iron-
works, usually at work necessitating heavy lifting. At 26 he
fell from a scaffolding, injuring his back, but, in a short time,
recovered perfectly. There is also about this time a history
of "soft chancre"; recovery took place in eight days, and there
were no "secondaries." At 29 he had severe "rheumatic
pains" in the knees, ankles, and shoulders for a half-year;
these were worst in the night-time and in wet weather. Six
months ago he had some specially heavy lifting (railway rails),
and beer has been taken to excess since about that time.

Father died at age of 33 from an accident, and mother at
54 with hemiplegia.

Three or four months ago patient began to be troubled with
pain shooting up the right side of the neck and behind the
ear to the crown of the head, the pain being worst in the
morning after beginning work, and aggravated by the lifting
of heavy weights. Two months later "a catching of the
breath" was experienced on taking a deep inspiration, and
there was now also greater severity of the pain and breath-
lessness on exertion. A fortnight before admission he became
aware of a beating lump in the front of the neck, and had pain shooting down the inside of the arm to the fingers occasionally. He "scarcely slept" after this time on account of the pain.

On admission patient appeared strong, very muscular, and healthy-looking, but apparently suffering a good deal of pain. The pain was almost constant in right side of the neck behind the vertical line of the ear, and was aggravated by lying on the left side. There was, however, no complaint of pain down the arm, nor of dyspnœa, dysphagia, cough, expectoration, or hoarseness. The pupils and radial pulses were equal, and the heart and lungs normal. At the supra-ternal notch, and to the right above the inner end of the clavicle, there was a rounded pulsating tumour about the size of a hen's egg, with expansile pulsation and pain on pressure, but no bruit. The treatment consisted of iodide of potassium, 20 grains, and bromide of potassium, 15 grains, thrice daily; ordinary diet, rest in bed, and morphia for the pain.

14th August.—The pain is less violent, and patient sleeps fairly well without morphia, but complains of slight soreness of the throat. The aneurysm now measures $3\frac{3}{4}$ inches transversely by $2\frac{1}{2}$ inches vertically. The superficial veins of chest are clearly seen.

19th August.—The patient's condition is much worse; the pain is extreme; the arms feel weak, and there are shooting pains down the inner side of both. The left radial pulse feels weaker than the right. A boring pain is located over the sternum. The tumour is doubled in size since admission, and the upper end of the sternum is pushed forward. The voice sounds squeaky and hoarse; cough, with a good deal of frothy expectoration, dyspnœa, and dysphagia are now present. The face is swollen, and there is great restlessness.

20th August.—Needles were introduced into the sac by Dr. Dalziel, and the following is a report of the operation kindly furnished by him:

"The patient was seen by me at the request of Dr. R. S. Thomson, as, in spite of medical treatment, the aneurysm continued to increase rapidly in size, with symptoms so distressing as to clearly indicate a fatal issue at an early date. Considering the success in inducing the formation of a thrombus by means of the introduction of needles after Macewen's method, we determined to try the procedure in this case, though deeming it an unfavourable one from the size of the aneurysm, but more especially its rapid and continuous increase, and the thin and distensible condition of the wall."
"Three needles were introduced—one in the supra-sternal notch, and the other two near each sterno-clavicular articulation, in this case wider apart than usual from the bulging forward of the chest wall. The thin coverings over the centre of the tumour were avoided.

"The centre needle passed downwards and backwards about 3½ inches, coming then in contact with the posterior wall of the sac. The needle could be freely moved, but the blood current produced only a feeble oscillation, probably not more than one-fourth to one-half of an inch, leading to the belief that there was little direct through current. Therefore, by manipulation, the point of the needle was made to gently scarify the interior of the posterior wall over an area estimated to be about 1½ to 2 inches in diameter. The needle was left in situ.

"The other needles, lying parallel to the lateral walls of the aneurysm, had their range of movement more limited, and this movement was principally towards the point of the centre needle. On the right side the needle seemed to come in contact with a calcareous plate.

"The needles were allowed to remain in for an hour. At the end of fifteen minutes it was observed that the centre needle had ceased to oscillate, and on manipulation was evidently fixed at the point. The others, however, continued to move, till at the end of half an hour the left needle was arrested, the right continuing to move, but with diminished range, till the end of the hour, when all were withdrawn. There was slight oozing from the punctures, easily arrested by a few minutes' pressure.

"Twelve hours afterwards the patient felt relieved, and beseeched to have the needles reapplied. The pulsation, though still distinct, had lost the markedly expansile character, and during the days the patient lived after the operation there certainly did not seem to be any further increase in the bulk of the tumour.

"Judging from the pathological report, it seems probable that a more favourable issue might have been expected had the treatment been employed before the aneurysm had assumed such dimensions as, in its situation, to render the continuance of life almost impossible."

After the operation patient slept fairly well, and complained less of pain in the head and neck. Next day there was no appreciable difference in the tumour, save some local redness.

24th August.—Since last note, patient has got rapidly worse. The tumour bulges forwards in the upper part of
the chest and neck, and outwards on either side of the neck. Evidence of pressure on oesophagus and trachea is now very marked, also lividity of the face, ears, and lips, squeaking and harshness of the voice, and laryngeal stertor.

25th August.—Death took place apparently from exhaustion and partial suffocation.

Post-mortem Examination.—External Appearances.—The body is that of a muscular man, well developed and well nourished. A rounded, somewhat flattened tumour occupies the front of the neck, with greater prominence on the right side than on the left. Its upper border passes over the thyroid cartilage, and its lower encroaches upon the thorax. The left arm is slightly swollen; it is not easily pitted on pressure, the swelling having a brawny character.

The chest.—Owing to firm attachment of the tumour-like mass, the sternum is divided opposite the first intercostal space, and the upper part of the manubrium, the first ribs, and the clavicles are left in position. The lungs are examined first. The left is firmly adherent over the apex, contains some old tubercular (cretaceous) nodules in its apex, and is hyperaemic towards the base. The right has very firm, old adhesion at the base, and adheres slightly to the lower end of the tumour as it appears in the upper part of the mediastinum. It is very hyperaemic throughout.

The tumour is now removed en masse with the surrounding structures and the heart.

The heart is fully relaxed, the right side being even somewhat distended. Its muscular substance is soft. The aortic valve is competent, although the curtains are somewhat thickened. On opening the aorta it is seen that the tumour is an aneurysm of the innominate artery. The orifice of the artery is considerably enlarged (sufficient to admit the index finger as far almost as the second joint), at the expense of the aortic arch. The aorta presents an advanced state of atheroma, which is continuous in the arch, and shades off both towards the heart and towards the thoracic portion.

The aneurysm is a bulky mass about the size of the two closed fists, and the greater part of the sac lies to the right of the middle line. It extends upwards as far as the pomum Adami, and projects backwards by the side of the trachea to impinge on the right carotid. Inferiorly it is limited by the loose tissues in the anterior mediastinum, passing below the upper end of the sternum a short distance. It also extends downwards a short distance in front of the sternum. Viewing
the aneurysm from behind, the only thing which attracts special note is expansion and prominence of the innominate artery.

At this stage the aneurysm is laid open in the middle line, and is seen to be really composed of two sacs—one of which forms the original true aneurysm, and the other a secondary false aneurysm. The true aneurysm is an expansion of the innominate artery, with its anterior wall apparently formed of laminated clot. The false aneurysm forming the bulk of the tumour in the neck contained about 10 ounces of fluid and coagulated blood. Its anterior wall is formed by the sterno-mastoid, -hyoid, and -thyroid muscles, much condensed and thinned, especially on the right side; its posterior wall, in the upper part, by fascia overlying the trachea and blood-vessels, in the lower part by a mass of laminated thrombus. The latter is conical in form, and projects forwards from a firm broad base of attachment over the postero-inferior part of the sac. It is about the size of a hen's egg, of a brown colour, and, on handling, is somewhat soft, although giving the impression of considerable toughness. The communication between the two aneurysms would appear to be closed by this thrombus formation, as no channel presents itself, and a probe fails to discover one. The clavicles appear in the sides of the sac internally, the right for about two inches, the left for a much shorter distance. The inner end of the right clavicle presents an eroded surface, upon which the thrombus mass impinges. Extravasation of blood appears in the anterior wall at a point in the vicinity of each sterno-clavicular articulation. (These correspond with needle punctures.)

The sac of the true aneurysm, displayed by an opening made in its posterior wall, measures 1½ inches by 1¼, and projects forwards and upwards towards the false aneurysm, from communication with which, however, it is clearly shut off by laminated clot. The orifice of the sac is comparatively large, commencing almost at the aorta, and involving about an inch of the arterial wall in its antero-lateral aspect. From the margin of the orifice the coats of the vessel can be traced for varying distances till they are lost in the laminae of the thrombus. The tissues around the lower part of the false aneurysm are infiltrated with blood.

A dissection is made to discover the relative position of the aneurysm to important structures in the neck. The trachea and oesophagus are displaced somewhat towards the left, and the course of the left common carotid and subclavian
Macewen's Operation.

is rendered slightly oblique near the aorta. The condition of the nerves on this side does not appear to call for note. The left subclavian vein is plugged by a thrombus. On the right side the carotid and the vagus run along in contact with the posterior wall of the false aneurysm. The vagus appears compressed by the true aneurysm just as it passes over the subclavian and is giving off the recurrent laryngeal. Both nerves for a short distance beyond this point are submitted to some tension.

Further examination of the coagulum is made after hardening in spirit. Even after shrinking it measures an inch and three eighths in thickness from before backwards, and its base has a diameter of two inches from above downwards. On section the cut surface shows a striking and instructive appearance. The mass is obviously composed of two somewhat different constituents—one pale, but not pure white, the other dark brown. These are variously intermingled, sometimes with distinct stratification, especially in the deeper parts, but at other places with a less definite arrangement. The paler constituent is distinctly in excess of the darker, and in some places forms a considerably expanded area.

Microscopic examination, which on account of the nature of the structure was made after embedding in celloidin, confirms the conclusion, derived from the naked eye appearances, that we have a mixed thrombus. The pale part is composed of fibrine and leucocytes. The fibrine is frequently condensed into homogeneous strands having sometimes a granular appearance, and at other times translucent, while in other places it has the usual finely reticulated appearance. It is in the latter that the leucocytes are manifest, and they are frequently present in very large numbers. This is especially plain in sections treated with alum-carmine, the leucocytes taking on the dye vigorously. The reddest parts of the thrombus are composed of red corpuscles along with fibrine, the latter small in quantity, but sometimes in the homogeneous strands mentioned above. It is particularly noticeable that stratification is much more distinctly visible in the sections under the microscope than on the cut surface of the mass as a whole. The former shows that the mass is stratified throughout, and that the strata are narrow and closely set, forming a finer stratification than that visible with the naked eye. This applies both to the darker and paler portions of the coagulum.
CURRENT TOPICS.

THE ROYAL INFIRMARY NURSES.—September will long be a memorable month in the annals of the Royal Infirmary. The month came in like a lamb, but before it advanced very far it developed the character of the lion. "Probationer's" letter to the Daily Mail of 2nd September acted very much like Jenny Geddes' famous stool in St. Giles', Edinburgh. It was the signal for an outburst of pent-up feeling, which found vent in numerous letters for weeks afterwards. As Scotland was none the worse of the proceeding which Jenny initiated, so we think the "Royal" will not suffer by the tempest created by "Probationer's" letter. Institutions as well as individuals need a periodic shaking up. As years advance the gait gets slower, and a little prodding à tergo at intervals is almost a necessity to prevent an absolute standstill. What are the nurses' grievances? That they are overworked and poorly fed, and that consequently they lose their health. They have been warmly seconded in their efforts to obtain redress by the residents in the Infirmary, who, however, make no complaint as regards their own fare, or as regards the food supplied to the patients. The Directors have shown themselves equal to the occasion by promptly appointing a special committee to enquire into the grievances of the nurses, and the result is awaited with much interest. We can scarcely doubt, however, what that will be. We feel assured that, if the nurses have suffered in the past in the way alleged, their wrongs will be put right as soon as they are fairly placed before the Directors. It cannot be the wish of any who have the welfare of such a valuable institution at heart that such servants as the nurses should suffer in health from the causes mentioned. It must be said as an excuse, if not a justification of the Directors, that this is the first time the question has come before them, and it might have conserved the interests of the Infirmary better had "Probationer" applied to the Directors for redress privately before bringing the matter before the public by a letter to the newspapers. We have reason to believe that the class of young women now devoting themselves to nursing is improving year by year, and we can quite suppose that the food and work thought suitable enough years ago, and among a different class of nurses, are now quite unsuitable; and it will not result in an injury to the Infirmary if the Directors, in however rough a fashion, are compelled to march with the times.
The University Club, Glasgow.—The premises acquired by the club in Bath Street are now nearly ready for occupancy, and the opening will take place on 6th October. The house is eminently suited for the purposes of the club. There is a reading-room of large size, a dining-room of still larger dimensions, a smoking-room, a card-room, and a large billiard-room with two tables. This last mentioned room will be an exceptionally fine one, and will give accommodation around the ingle-neuk to many besides the players. This room, as well as the smoking-room, will be lighted by means of Wenham lamps, and there is in connection with them a very efficient arrangement for ventilation by means of shafts and conductors. The lavatory accommodation is very complete in the ground-floor. There will be two bed-rooms for the accommodation of members of the club. In connection with the surveying department it is intended to have a daily hot lunch for one shilling, and a full dinner in the evening for three shillings. The club has been very largely joined by medical men, who form the largest section of its members.

The General Council of the University.—There is to be a special meeting of the council on 6th October to consider the Ordinances issued by the University Commissioners in regard to graduation in Arts and Science. The Ordinances relating to graduation in Medicine will not be considered till the statutory meeting on 28th October.

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REVIEWS.


In this exceedingly interesting and ably argued monograph, Dr. Cappie expounds and defends the views which he has held for many years with regard to the intra-cranial circulation, its peculiarities and adaptation to the requirements of the brain as the organ of consciousness and mental activity. He tells us that he approaches the subject, not as a physiological specialist, but as a general practitioner, and that he bases his conclusions upon well established facts considered in the light of generally admitted physical or physiological principles.
He holds that the cranium has been viewed too much as a simple organ of protection, and that more attention should be given to its positive influence on the physiological action of the brain itself. He postulates that the cranial cavity is air-tight, and that as its solid contents do not change quickly, it is impossible for the volume of its fluid contents to vary. He holds that the quantity of lymphatic or cerebro-spinal fluid is practically constant and unaffected by atmospheric pressure on the general surface of the body. In this point his argument is undoubtedly weakened by the fact, of which the author seems to be unaware, that every spinal nerve is surrounded by a lymph space, whose contained lymph is in direct connection with the subdural and subarachnoid space of the central nervous system. It is thus quite conceivable that if the quantity of blood within the cranium be diminished, there will be a determination of lymph from the spinal canal upwards under atmospheric pressure. Dr. Cappie, holding this to be practically impossible, explains the varying conditions of cerebral nutrition and activity by changes in the equilibrium of the encephalic circulation. When the brain, in whole or part, is roused to activity, its cells, by chemical affinity, demand a larger supply of fresh blood. This being freely supplied through the carotid and vertebral arteries, causes a certain distension of the brain mass, with consequent increase of pressure on the cerebral veins, and increased discharge of blood by the venous sinuses. After a period of activity the brain cells become exhausted, and unable to respond to stimuli, mental, or from the periphery. With lessened power of action comes lessened demand upon the blood for material. Hence, the arterial and capillary system become comparatively empty, and the brain diminishing in bulk, pressure on the cerebral veins is diminished, and venous blood tends to accumulate. The atmospheric pressure on the soft tissues of the neck also exercises a retarding effect on the outflow of the venous blood.

Thus, there arises an alteration in the balance of pressure; it is less from within and more on the surface, less expansive and more compressing, and, if it reaches a certain degree, the compression leads to unconsciousness, as in sleep. Again, if the activity is limited to one part of the brain, and if that part becomes enlarged by an increased quantity of arterial blood, it will lead to a temporary diminution in the blood supply of surrounding parts, the encephalic circulation will be focussed in the direction of activity. Thus, we arrive at a physical basis for the phenomena of attention, in which one
part of the brain may be supposed to be above, while the rest is below, the normal standard of activity.

Dr. Cappie adduces many arguments in support of his theory, which undoubtedly has much in its favour. The important experiment by Prof. Mosso is not, however, readily explainable on his hypothesis. Mosso made arrangements by which the weight of the head could be accurately ascertained in various conditions, as during sleep, or when the mind was actively engaged. He found that in sleep the head was lighter than during the waking condition, and that when all the mental faculties were on the alert and the attention aroused, the head was heavier than when the mind was at rest. This increase in weight may be explained in various ways, however. It can hardly be due to a larger quantity of fluid in the inextensible cranium, as has been supposed, but it might be due to a displacement of a certain amount of lymph by blood which has a higher specific gravity (1015 : 1060), or to the accumulation of solid products of tissue metabolism, and an accompanying displacement of fluid.

At the same time, if Dr. Cappie's hypothesis does not embrace the whole truth, it probably goes far in the right direction; and, in these days of dry manuals and dislocated experimental facts, it is very enjoyable to come upon a book which is at once close in argument, pointed in illustration, polished in literary style, and philosophic in its breadth of view.

The volume is handsomely printed and illustrated, the diagrams showing the appearance of the retina in the waking and in the comatose state being specially instructive and interesting.

It is well worthy of perusal by all who take an interest in the physical and physiological concomitants of mental phenomena.


The contents of this volume originally formed an essay, which was awarded the Boylston Prize of Harvard University, in July, 1890. In the introduction to the work there is a brief consideration of the pathology and treatment of fever, while No. 4. U Vol. XXXVI.
the bulk of the volume is devoted to a discussion of the therapeutic and other results produced by certain antipyretic drugs—viz., antipyrin, antifebrin, phenacetine, thallin, and salicylic acid. There is also a short note appended on the use of cold bathing in febrile states. In the opening chapter, after a statement of the conditions which affect the range of temperature in the body, and a discussion of hyperpyrexia, reference is made to the relationship between the pulse-rate and pyrexia, and the dangers of fever. This last section is disappointingly brief. Pyrexia, as a clinical expression of disorder among the processes concerned with the control of body-heat, has a definite meaning, but its value as one factor among many on which a prognosis is to be founded is unfixed. Moreover, hyperpyrexia, as a feature of clinical significance, is a purely relative term, relative not only to the stage of the disease in which it occurs, but to the disease itself. And now that there is a general disposition to regard pyrexia as being in most instances completely under the control of antipyretics—the fever itself remaining finally unaffected—one seems to miss from this section of Dr. Hare’s work any discussion of the height a temperature may reach before active antipyretic treatment is demanded.

By far the greatest interest in the work attaches itself to the chapters in which the author discusses the various drugs formerly mentioned. He has been at evident pains to add to his own experience everything of importance that has been written in regard to them, and the result is that probably nowhere else does there exist the same complete résumé of their action as is here given. The evidence is arranged in an extremely systematic manner, and falls under two divisions—viz., experimental and clinical. Under the first division Dr. Hare details the effect of the several drugs on heat-function, circulation, blood, tissue-waste, nervous system, respiration, toxic changes, and elimination; and the clinical evidence comprises a review of the general influence of each drug in healthy subjects, its use in fevers and in nervous affections. The work itself should be consulted in respect to the evidence adduced, but Dr. Hare’s conclusions may be here quoted. In regard to the reduction of fever, antipyrin stands foremost in the ranks of the antipyretics, with antifebrin next, then phenacetine and thallin. In pain antipyrin still leads, but phenacetine is quite as useful as antifebrin, and more safe. In rheumatism the salicylates act better in reference to pain and the cure of the disease, but the others control the fever of rheumatism more effectively.
Marked depression and adynamia, as a rule, contra-indicate the use of all antipyretic drugs.

A word is said in favour of cold sponging, in that it is effective as an antipyretic, and comparatively safe even in the hands of the inexperienced.

Dr. Hare is to be congratulated on the result of his labours.


The editor of this portion of the tenth edition of "Quain" holds a high reputation as a histologist, and, indeed, it may be said that in knowledge of the recent work in this department he stands second to none in this country, while he has in addition, by his own original investigation, largely assisted in the modern development of the subject. The new volume fully justifies the reputation of its editor, and Professor Schäfer has to be congratulated upon the successful issue of this portion of his work. There is no department of anatomy in which differences of opinion are more likely to obtain than in histology, and the literature of each special division of the subject has grown large by virtue of discussion and argument. Perhaps there is no observer who will agree with the editor on every point, but, on the other hand, it must be allowed that, as far as the exigencies of space have permitted, Professor Schäfer has done justice to views other than his own, and the frequent historical notes, and the lists of recent papers with which each article is concluded, will do much to help the student who is desirous of pushing his studies beyond the text-book limit.

On the structure of protoplasm, its movements, and the process of cell division, much work has been done of recent years by Carney, Flemming, Van Beneden, and others, and largely taken part in by Professor Schäfer himself. Very important is the clear distinction drawn between the more solid part of the protoplasm or spongioplasm and the more fluid or hyaloplasm, and the theories of amœboid movement and contractility deduced from observations on the relative behaviour of the two substances of which the cell is composed, show an interesting attempt towards the further elucidation of vital phenomena. In an amœboid cell the emission of pseudopodia is seen to be due to the flowing movements of the hyaloplasm which escapes from the reticulum of the spongio-
plasm, and retraction upon irritation is apparently the result of movement in an opposite direction. In the irritated condition the hyaloplasm is entirely withdrawn within the meshes of the spongioplasm; in the absence of irritation pseudopodia are emitted. Without commenting on the relative value of spongioplasm or hyaloplasm, or theorising as to the causes of the emission or retraction of the latter, it may be fairly assumed that contractile phenomena may be associated with movement of the more fluid portions of the protoplasm. In the article upon epithelium, Professor Schäfer has suggested that ciliary motions may be explained by this hypothesis. He regards a cilium as a hollow extension of the spongioplasm, and looks upon the movement as the result of a rhythmic flowing of the hyaloplasm into and out of the cilium.

The most interesting chapter in the volume, however, is that appertaining to muscular tissue, a subject to which Professor Schäfer has devoted much original work, and on which he has been able to throw, from his researches on the wing muscles of insects, a great deal of additional light. In the ninth edition the "muscle rods" were looked upon as the important contractile portion of the tissue, and the alteration in the shape of the muscle upon irritation was regarded as being due to a change in the shape of the rods, an enlargement of the knotted ends at the expense of the connecting stems. The deductions which Professor Schäfer makes from his recent researches bring the explanation of muscular contraction into line with the theory offered to explain amœboid and ciliary movements. The striped muscular fibre surrounded by its sarcolemma is regarded as being composed of two substances, a contractile substance arranged in columns called sarcostyles, corresponding to fibrils, and a variable amount of connecting non-contractile substance or sarcoplasms. Each sarcostyle is divided into sections by membranes which occupy the position of the clear band in the fibre; the non-contractile connecting substance is disposed between the columns in lines which are thickened, and appear like knobs in the clear band of the fibre. Each section of the sarcostyle or muscle column is formed of spongioplasm and hyaloplasm, the latter corresponding in position in an uncontracted fibre to the clear band, but altering its position during contraction by flowing into the substance of the spongioplasm. It will be seen that this view of muscular structure and contractility, though in keeping with the hypothesis already explained, is very different from any of the large number of previously accepted ideas.

Comparing generally the new volume with the correspond-
ing part of the ninth edition, it is interesting to note the skilful way in which so much that is new has been accommodated without any undue increase in size. The plates are excellent, and the publishers deserve credit for the manner in which their part of the work has been done.


In retiring from the chair of anatomy in St. Mary's Hospital Medical School, which he had occupied for twelve years, Mr. Owen, as he tells us, desired to leave some permanent record of his work which might prove of interest and assistance to senior students. He has accordingly published the volume now before us, in which he has broken new ground, departing from the beaten track both of the pure anatomist and of the surgical anatomist. His pages contain no mere formal description of anatomical details, although all the structures of the body are described more or less minutely, nor does he simply discuss regional anatomy from the surgeon's point of view. Mr. Owen has recognised the fact that senior students—and he might also have added all general practitioners—although they may no longer be interested in the minutiae of anatomical detail, cannot fail to be interested in the structure of the body in its relations to both medical and surgical affections. He has accordingly in this volume discussed not only anatomical structure, but also the bearing of both structure and function on medical and surgical affections. For example, he not only describes the arterial and venous circulation in the scalp and diploë, but he shows how the communication between these vessels and those of the membranes of the brain accounts for thrombosis of the sinuses which occurs in some cases of erysipelas of the head, and for septicaemia arising from wounds of the scalp. So also in regard to the brain—its formation and structure are briefly but broadly described, and the various forms of paralysis resulting from cerebral lesions are noticed, and their pathology related to the anatomical structure. In the case of the lungs, Mr. Owen has passed in review the chief diseases to which they are liable—e.g., emphysema, asthma, bronchitis, &c.
endeavouring to associate the leading symptoms with the pathological state. In this way much useful information is conveyed; but it must be confessed that it is in a sort of scrappy way. When he goes on to give a brief account of the modes of examining the lungs by percussion and auscultation, we think he has rather lost his way—such an account being uncalled for in a work of this nature. Besides, he has omitted what would have been its best justification—namely, an endeavour to explain on an anatomical basis the causation of the respiratory murmur, and of the other phenomena he mentions, in normal conditions. Mr. Owen is, no doubt, more at home when he is dealing with the surgical aspects of anatomy.

These illustrations will serve to show the nature of this book, and at the same time the temptation that Mr. Owen has been under to digress, as we believe, from his true path. We must, however, congratulate him on having seen that there was room for such a work, and on having supplied the want in a form which, we have no doubt, will commend itself to many readers.


In the preface to this, the most recent of the many books on surgical anatomy now offered to the student, Mr. Shield tells us it is "intended to use with the living model." It is, of course, highly desirable that a student should know anatomy, not only as seen in the dissecting room, but so that he will be able to map out the internal organs, blood-vessels, and muscles readily on the living subject. The directions for doing this, given in the book before us, are put clearly and well. At the same time, we notice that several of the more purely anatomical descriptions are in somewhat loose terms, which is unfortunate; for anatomy, to be of any use, must be precise.

We deem it unfortunate, also, that the anatomy relating to fractures and dislocations, a subject of much importance to the student and surgeon, receives practically no consideration.

On the whole, however, we think Mr. Shield has produced a book which, in the direction indicated, will prove useful to the student.

The authors of these two volumes present us with a small cyclopædia, in which the attempt is made to include nearly everything relating to the subjects of which they treat. They differ from most authors in somewhat decrying experimental therapeutics, even as carried on in well equipped laboratories. They think that "little is to be gained to practical therapeutics by the needless repetition of well established operations which require the exhibition of lethal doses of drugs whose physiological action is thoroughly understood. No true and reliable system of treatment can be based on such experiments, nor upon the experiments of physiologists on persons enjoying apparent health, although such observations are of some value in aiding the physician to determine the special direction manifested by a drug used as a toxic agent. In disease the entire nervous system is so affected that the action of a drug thus studied cannot be estimated, and, as a consequence, we are compelled to be guided in many instances by these observations and by experience rather than by physiological tests; but our deductions are not to be based upon these alone to the exclusion of facts brought out in the course of investigation—chemistry, pathology, and our knowledge relating to microorganisms must also be taken into account." With these views there will, in the mind of the practical physician, be a certain amount of sympathy; and yet it is the case that, especially in dealing with powerful drugs, we must constantly hark back to physiological action as a guide to therapeutic use, and our practice will become scientific when it is wholly based on such knowledge.

The first volume treats of Pharmacy, Pharmacology, and Therapeutics in general, and with the detailed consideration of such remedial agents as electricity, oxygen, hydro-therapeutics, masso-therapeutics, heat and cold, metallo-therapy, hypnotism and suggestion, earth-dressing, Baunscheidtismus, light, music, and suspension—subjects, many of them, which find no notice in ordinary works on therapeutics, but all discussed with much ability, and conveying information in an interesting and readable fashion.

The second volume seems to be the work of Dr. Shoemaker alone, and deals entirely with drugs. Like the first volume, it is based chiefly on the United States Pharmacopœia, but we
should fancy there is scarcely any substance which has ever been used as medicine which is not included in this work. A list of several dozens of drugs might be made which are here discussed, but of which the average practitioner has probably never heard, and will never use. That the volume is "up to date" is evident from the space devoted even to "Koch's tuberculin," of which the author, doubtless to his present satisfaction, expressed himself in rather a conservative vein, recognising the energy of the fluid, but leaving the estimate of its therapeutic value to the future. He is probably right also in the conjecture that Koch's procedure contains the germ of the future treatment of infectious diseases.

As a whole, we must speak favourably of this work; it differs markedly from most books on the same subjects, and is distinguished by a certain degree of freshness and originality.

_**A Laboratory Course of Pharmacy and Materia Medica.**_

**By William Elborne.** London: Charles Griffin & Co. 1890.

This is a carefully planned, and, on the whole, a well executed work. The author has had considerable experience in the teaching of practical pharmacy, and students of that art will find his guidance and direction both helpful and trustworthy. After a general introduction and a description of the processes of weighing, measuring, estimation of specific gravities, &c., he divides his book into three sections—viz., Chemical Pharmacy, Galenical Pharmacy, and Dispensing, and in each section offers examples of typical processes for the student to work. The selection of these evidences much judgment, but the rationale of the various steps is not always explained as fully as could be desired. In the section on Dispensing we should like to have seen a larger number of examples of prescriptions ordering medicines in the pilular form, and whilst much useful information is given in regard to the selection of excipients, no mention is made of the use of kaolin ointment as an excipient for such substances as permanganate of potassium and nitrate of silver. The examples illustrating various incompatibilities, and the lists of abbreviations used in prescriptions, and of popular synonyms of official drugs and preparations, form useful features of the book. Some few errors may be advantageously corrected in a second edition—thus, from the preparations of _Conium_ the pill and inhalation are omitted, from those of _Sinapis_, the
liniment; and under hydrochlorate of morphine no mention is made of the two lozenges which contain this salt. On p. 181, the directions for preparing Liquor Arsenicalis give twice the proportion of Tinct. Lavand. Co. ordered in the Pharmacopœia, and the description of the preparation of Decoct. Hamatoxyli on p. 152 is incorrect in an important feature. The first vowel in Pareira is a not e (p. 153), and Pod. (p. 111) is certainly not an elegant abbreviation of Podophyllum, nor Con. (p. 115) of Colocynth. These, however, are slight blemishes, and the book may, without reserve, be warmly commended both to writers and compounders of prescriptions.


The success of Dr. Bruce's book—the present is the fourth edition—is undoubted, and in our opinion is well deserved. In its main scope the book is therapeutic. Materia medica is, however, by no means neglected, and much detailed information with regard to the chemical and pharmaceutical relations of drugs is given. Dr. Bruce confines his chapters on therapeutics almost entirely to medicinal therapeutics, though, at the end of the volume, he supplies some useful information in regard to the use of baths, packs, douches, &c. This section merits a special word of praise for its fulness of detail, a feature so often exasperatingly absent from descriptions of these methods of treatment. The greater portion of the book falls into two sections. In the first part each drug is considered as a remedy, and its effect on the various tissues and organs is followed systematically from the time of its introduction into the body until its final ejection. This natural method applied to each remedy has the advantage of both stimulating the interest and assisting the memory of the student, as well as teaching him the habit of carrying his knowledge of physiology into his practice as a physician. The latter part of the book is devoted to general therapeutics. Each organ and function of the body is studied in relation to the drugs by which it may be influenced, and the practitioner will find in the chapters comprised in this section a reliable account of the medicinal treatment of the various diseases and disorders which he meets with in practice. This is a most useful feature of the book, and forms a pleasant contrast to the barren "lists of remedies" and ready-made prescriptions which are so often found in students' manuals. We
can scarcely speak so highly of the short account of the groups of the official galenical preparations. The information here given is very incomplete and bald, and, we think, be considerably extended with much advantage. The present edition is well up to date, and includes an account of the drugs recently added to the Pharmacopeia.

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We can find very little to say in recommendation of this work, or of the class of books to which it obviously belongs. There is, unfortunately, some apparent demand for such productions, and so long as glibness and readiness at the examination table are the passports to the enchanted land—the land of the "qualified"—so long will certain classes of students place their faith in "grinds." There is no author's name on the title-page of this work, and yet it is not a thing to be entirely ashamed of. Of its kind it is fairly good, and might conceivably be of some service to a student on the eve of an examination.

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These notes are prepared on the lines of the author's well known *Official Materia Medica*, and contain a well arranged presentation of the pharmacopoeial facts regarding the valuable new drugs recently made official. They should be serviceable to the practitioner who wishes to prescribe intelligently, as well as to the student.

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We can scarcely imagine any one whom this work is likely to interest. It gives, after a short discussion of ointments in general, a conspectus of those found in the *United States Pharmacopoeia*, the British, German, French, Austrian, Italian, Spanish, Mexican, and Chilian Pharmacopeias. Many of these are curiosities in their way, such as the Spanish.
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Ungüento de Artánita Compuesto, which contains sixteen ingredients, one of which again contains six constituents—twenty-one in all! The second part of this volume is of some real value, but is simply a reproduction of the author's well known paper on the Oleates. The book, as a whole, strongly suggests deliberate book-making.


This book is the outcome of its author's habit of writing out dietaries for his patients. It is not merely, however, a collection of sick menus. The various diseases are first discussed in so far as their symptoms and pathological conditions influence the dietary, and the way having thus been paved, suggested dietaries are given, with full details as to the quantities of food to be taken and the hours at which food is to be administered. In addition, alcohol, predigested foods, and sick-room cookery receive consideration.

We think that there is room for a work of this sort; medical men are so often ill-informed as to foods and cookery as to be unable to suggest those little delicacies that tempt the palate of a sick man. To some extent this volume supplies the want. But we confess to a slight feeling of disappointment following our perusal of it, and we would suggest that, if a second edition be called for, the author should devote less space to general remarks, and give more alternative diet schemes.


The little book before us is chiefly a résumé and discussion of the opinions of a large number of authors—American, English, and Continental—on the subject of epilepsy, and the diseases allied to or resembling it. Our author reveals a very wide and cosmopolitan extent of reading, so that the book forms a very fair index of the modern writers on the subject; from this very fact, or from the material thus acquired not being sufficiently digested and assimilated, the result shows a want of cohesion, is rather scrappy in character, and therefore not such pleasant reading as it might be.
The writer relies almost entirely on the experience of other men for the tables and cases which he uses in illustration of his arguments, and seldom gives any information from his own experience and practice.

In discussing treatment our author gives a comparatively minute description of Victor Horseley's method of operating in cases of Jacksonian epilepsy—a description which is quite out of place in his book, and which also shows a want of knowledge of the work done in the same field by other surgeons.

The book would be much improved by affixing a table of contents, and we notice some grammatical errors, as where the writer uses a plural verb after a disjunctive conjunction. We think it would have been a decided advantage if our author had discussed more fully the method of treating cases of the diseases as regards not only medicine and diet, but also with reference to habits, clothing, &c.

On the whole, the book is of great interest, and well worth reading; and we hope that in future editions it will be improved, and made more useful to the practitioner.


This first volume of a new venture gives every promise of success. It gives thirty-six lectures by distinguished physicians and surgeons in this country and America, amongst whom we welcome the names of our confrères in Glasgow, Gairdner and Finlayson. These are genuine clinical lectures, and not merely systematic treatises pinned on to cases, although very properly a general view of each subject is given in elucidation of the case and for the better understanding of the disease.

We propose by way of extracts to illustrate the style of the work, and to introduce our readers to some of the more important work which is recorded here.

Sir Dyce Duckworth has an excellent lecture on Chorea. His view of the causation of the disease is contained in the following:—

"The thesis that I shall try to prove is that chorea is a
manifestation of the rheumatic habit or diathesis, determined, or precipitated, oftentimes, by some sudden emotion, as fright, or occurring sometimes without such recognisable determinant. This is no new view. Eight years ago I put it forth. It is by no means generally accepted, nor is it in every case possible to set out unequivocal proof of the truth of it. All I can say now is that the more of the disease I witness the more convinced I feel of the truth of the view I take." . . . "The theory of chorea which claims for this disorder embolisms of minute cerebral arteries is one which must ever be spoken of with respect in this place. It was to the acumen and ingenious views of Kirkes, physician to this hospital, whose pupil I had the honour to be, that this theory was due. Dr. Hughlings Jackson supported it, and another pupil of this school, Dr. Tuckwell, of Oxford, threw additional light upon it. You see that this view presupposes endocarditis, and that particles of fibrin are shed off from the inflamed valves and driven into the small vessels of the corpora striata. It is not doubted that chorea may cause endocarditis, and no one will pretend to distinguish a choreic from a rheumatic form. This theory of embolism as a cause of chorea is now discarded." . . . "One thing is certain, that whatever the etiological disturbing factor, the phenomena of the disorder remain the same. The heart is involved equally whether the case result from shock, emotion, rheumatism, pregnancy, or what not. My argument for chorea being a manifestation of the rheumatic habit of body is as follows:—It being allowed that fully one-third of all cases is connected with rheumatism, more or less fully expressed, we have to account for an etiological relation for the majority. It is not easy to believe that fright, shock, or pregnancy should induce a disorder precisely similar to, or at all events practically undetectable from, chorea; further, that any of these causes should induce a form of endocarditis also indistinguishable from that due to rheumatic influence. It is easier to believe that these exciting causes should so act, and evoke in persons of the rheumatic diathesis a train of symptoms uniform in all cases."

On the treatment of chorea the following remarks are made:—

"For drugs, I have already alluded to arsenic as of great value. For the general condition of nerve-centres on which chorea depends I will not hesitate to pronounce it summum remedium. For the control of the motor disturbances I know of nothing better than, and of nothing equal to, chloral hydrate. I have often employed trustworthy preparations of conium,
and pushed them in large doses (1 to 3 ounces of the succus) twice or thrice daily, without finding any very noteworthy good or ill effects. Zinc sulphate has some repute, and so have preparations of iron. The late Dr. Radcliffe employed morphia and alcohol in full doses, even for young children, with, as he believed, the best effects. I am not satisfied with the results, nor with the desirability of such medication. Of strychnine, as recommended by Sir Alfred Garrod, I have a much higher opinion, and have witnessed good results from its employment."

The lecture by Charles K. Mills, M.D., on Myotonia and Athetoid Spasm, is of much interest. It is illustrated by photographs excellently rendered. On Myotonia or Thomsen's Disease, after fully describing a case, the lecturer says as follows:—

"Let me, even at the risk of some repetition, summarise briefly, at the same time demonstrating to you, with the patient before us, the main points and features. The case dates back to childhood, and it is not at all improbable that an hereditary history is somewhere concealed. Often, particularly in this traditionless country, family history is difficult to obtain, and much of it, when got from sick or comparatively ignorant patients, is worthless. This man, however, does not know of other cases like his own, or of other forms of nervous disease in his family. His affections is undoubtedly spastic, and while spastic conditions are always more or less present, they are without doubt excited and aggravated by voluntary effort. Let me stop to illustrate this to you. I will have him walk around the arena. Notice his peculiar attitude and gait, very slightly bending forward, his eyes taking in the floor, somewhat like an ataxic. He moves with short, quick, and yet shuffling, close-limbed steps. He walks in a measured way, like one in fear and dread. This is his mental condition, in consequence of the severe falls he has had. I tell him to sit down. He does so in a stiff, awkward manner. I ask him to open his mouth, and now to shut it. Observe his expression and his efforts. In spite of his efforts he is unable to close his mouth until, as indicated in the photograph, he places his hand to the side of his jaw, and using a little lateral pressure, it goes shut slowly and with an unlocking sound. Asking him to rise from the chair, he does so with effort, climbing to the erect position slowly. As already stated, and as you can see, the photograph has caught him just as he has half reached an erect position. We assist him to his knees, fearing that he may fall. He is totally unable to rise until now, with the
assistance of the resident physician, I lift him upon his feet, being careful to get his legs so placed that his centre of gravity shall be all right before letting go. Watch the striking experiment of having him close his hands firmly, and then try to open them again. The more his efforts increase the more difficult does the work appear. His arms bend and twist, his fingers begin to open as, with every appearance of intense effort in face and limbs, he throws all the force he can command into the task. Finally, with a supreme effort, his fingers are unclasped, and now they limber up rapidly. As stated in his history, and as I demonstrate, the knee-jerk, muscle-jerk, front-tap, and ankle-clonus are not present."

... "The muscles do not suffer, at least so far as nutrition and appearance are concerned. In fact, we have, as might be expected when the frequently repeated forced exercise is considered, undue muscular development. Look at this man’s trunk and arms. He has the appearance of an athlete, and his muscles to the touch are firm and hard. Yet his appearance is a parody upon his powers of performance. Muscular-appearing as he is, strong indeed as he may be in reality if his efforts could be controlled, the merest child can overcome him. According to some of the best authorities the disease is really, in the extreme sense, a muscular one. It has been described as a congenital malformation of the muscular fibres."

Dr. Ferrier has a lecture on Alcoholic Paralysis, which conveniently summarises both the clinical and pathological facts known in regard to this disease. He says, for example:—

"The abuse of alcohol, in addition to its well known injurious effects upon the organs of assimilation and excretion, gives rise to a form of peripheral neuritis affecting the motor and sensory nerves, which results either in ataxic or paralytic disorders, of the latter of which the cases I have described are examples.

"The ataxic form is perhaps not quite so common as the paralytic form. Both are affections of adult age, and women are perhaps more liable than men. Alcoholic ataxy resembles tabetic ataxy in the numbness of the feet, the occurrence of neuralgic or ‘rheumatic’ pains, absence of knee-jerk and disorders of locomotion and equilibration. Neither weakness nor wasting of the anterior tibial group of muscles may be obvious, and in such cases it may not be easy to distinguish between the alcoholic and the progressive form of ataxy. Not unfrequently, however, in alcoholic ataxy there are indications of drop-feet, and it may be also of drop-wrist, with impaired
faradic contractility of the anterior tibial group of muscles and extensors of the forearm, which are important aids to diagnosis. In such cases the walk is somewhat different from the true ataxic walk, and the patient not only throws out his feet brusquely, but steps high in order to clear his toes of the ground."

"In the second, or paralytic, form of alcoholic neuritis there is a variable combination of sensory, motor, vaso-motor, and trophic affections. The sensory disorders consist of pains, frequently intense and often worse at night; or of paraesthesiae or perversions of sensation; and the sensibility is frequently impaired to tactile, painful, and thermal stimuli, and as regards the muscular sense, or sense of position. The degree in which these various symptoms may present themselves in any given case is very variable."

"The motor paresis, or paralysis, specially affects the anterior tibial group of muscles, innervated by the external popliteal nerve. Not unfrequently the paralysis is entirely confined to some or all of the muscles of this group, but, on the other hand, the extensors of the fingers and wrists, as well as other muscles of the legs and arms, may also be invaded. In general, the extensor muscles suffer first and most severely. It is a curious fact that in chronic poisoning by lead, also a toxic peripheral neuritis, the extensors of the fingers and wrist are, as a rule, the first to be affected, causing drop-wrist; whereas in alcoholic neuritis the dorsal flexors of the feet exhibit the greatest proclivity, resulting in the characteristic drop-feet. While drop-wrist is the primary form of lead-palsy, drop-feet is the primary form of alcoholic palsy. Occasionally, however, the order is reversed, and cases of alcoholic paralysis occur in which the extensors of the fingers and wrist are mainly, if not exclusively affected."

After pointing out that alcoholic paralysis is like the paralysis due to lead and arsenic poisoning, and that which follows certain epidemic and endemic diseases, such as diphtheria and beriberi, he goes on to refer to the pathological conditions, and says:—

"The affection of the nerves induced by alcohol is essentially a parenchymatous neuritis, and is similar to the degeneration which occurs when the continuity of a nerve is interrupted at any point. The myeline sheath becomes swollen and segmented, and ultimately breaks up, together with the axis-cylinder, into smaller and smaller fragments, which are ultimately absorbed more or less irregularly. The nuclei of the nerve-sheath increase and proliferate, and, as the process advances,
the sheath may be seen to be in parts empty or in other parts filled with broken-down myeline, or it may be entirely empty and converted into fibres of connective tissue. In some cases, also, there is increase of the interstitial connective tissue, and infiltration with leucocytes. These changes are most marked towards the periphery of the nerves."

"Changes in the muscles are seen corresponding to the severity of the process of degeneration in their nerves. The muscular fibres may show only some degree of atrophy as compared with those of a normal muscle. In other cases the transverse striation becomes less distinct, and may ultimately disappear, while the nuclei and connective tissue elements become largely increased. Correlative with these changes are the alterations in the electrical contractility of the muscles, the chief characteristic of which is the diminution or disappearance of the faradic contractility, while the reactions to the galvanic current are those of the various degrees of the reaction of degeneration."

In the treatment of alcoholic paralysis the following are the views of Dr. Ferrier:—"In the treatment of alcoholic paralysis the first requisite is the entire removal of the cause. Without this, no good can be effected. I make it a rule to cut off alcohol absolutely, and not to administer it except in threatened failure of the heart’s action. The next requisite is absolute rest. The patient must on no account be allowed to use his limbs voluntarily; not at least until the tenderness of the nerves and muscles has practically disappeared. To relieve the pains and parästhesiae, I have obtained the best results with a mixture of five grains each of the iodide of sodium, salicylate of sodium, and antipyrin. I occasionally add to these five grains of salicin or croton-chloral. When the pains and hyperästhesia have subsided, massage and gentle electrical stimulation, either galvanic or faradic, may be employed, but these methods should not be had recourse to in the early stages, as they are apt to increase the patient’s sufferings. With this local treatment I am in the habit of administering Easton’s syrup, alternating with phosphorus in doses of a thirtieth of a grain twice or thrice a day after meals. By treatment on these lines a large number of cases of alcoholic paralysis entirely recover."

The last paper on which we shall remark is one by Weir Mitchell on the Treatment of Obstinate Sciatic Pain by Splinting and Cold. The object of the lecture is thus given:—

"My present object is rather to point out for you what to
Reviews.

do in turn for cases of grave sciatica, or, as I prefer to say, sciatic neuritis. A brief summary of a case will suffice. A man has had recurrent attacks of sciatic pain—at last the disease is constant. He cannot stand long or walk without pain. It is worse after 4 p.m., whilst fifth-nerve neuralgia is worse in the forenoon."

"The old sciaticas are most obstinate. They last for months or years, destroy the power to work, cripple, enfeeble, and torment. At last, too, they trouble the nutrition of the leg and in variable degrees affect its sensibility. There is no need to dwell on their history. I pause only to add that true double sciatic neuritis is rare. Of course, in general neuritis which is, as a rule, toxic, it is to be met with. Pain in both nerves is apt to exist with pain in the sacrum or loins, and to be due to spinal or caudal disease. Generally, old sciatica is single."

Such cases he treats first with the long splint. His directions for the application of the splint are worthy of careful perusal. They are as follows:—

"Now, rest in bed is no new idea, but do not imagine that merely keeping a man in bed is the rest I mean. Put the man in bed—that all of us do—but also put his leg at rest with a long old-fashioned splint such as used to be employed in fractures of the thigh. It should extend from axilla to foot, and be held in place by light bandages; and in some cases it is convenient to have it made with a joint at the knee, and a mode of fixing this rigidly at an angle. Another form, which if we use rest with cold has to be employed, is a roughly moulded anterior splint, with a wooden attachment carried up laterally to the waist or axilla, or a wire frame of like shape. But no matter what form we employ to keep the limb at rest, certain points need attention to lessen the annoyance and evil of local rest thus enforced. Take care that the ankle is so sustained that the heel does not carry the weight of the leg. Be desirous of having the knee in gentle flexion, and change this flexion angle a little, a very little, at each dressing. After a few days of undisturbed rest, at each dressing carefully flex and extend all the joints; but do this slowly and slightly, our object being to prevent too great stiffness, the common evil which follows the use of a splint. It is not essential, and only advisable if done with caution. Use enough bandage to keep the splint in place, and no more, as you do not or should not wish to overheat the limb or disturb its circulation. Finally, there are people who cannot bear a long splint, and in these some good may be had out of an
anterior suspension-splint, taking care to have the limb lifted but little."

In obstinate cases something more may be needed, and this he supplies as follows:—

"I employ dry cold, as I have now done for very many years, and I use it either in conjunction with or without absolute rest. Success in medicine depends often on attention to details, and as concerns employment of dry cold in sciatic neuritis this holds good.

"In old and obstinate cases an ice-bag of caoutchouc is kept on the painful nerve-tract day and night for two or three weeks. This is to be but moderately filled with ice and water, so as to lie flattened. The Davidson bags are badly made; the Chapman spinal bags are better, though costly and difficult to procure in America. In any case, we desire to cover the whole length of painful nerve, and a breadth of 3 to 4 inches.

"In this hospital we now prefer to place the leg on a tin or copper gutter; on the under part of this is the ice-case, 3 to 4 inches wide, with a screw opening 1½ inches wide on the side, made to fit the thighs right or left, whilst another at need receives the calf."

"The effects of dry cold thus used in sciatica are sometimes most remarkable; but, despite the fact that I have clinically described its use for nineteen years, and have again and again mentioned it in print, the method has been little used by others."

From these copious extracts our readers will infer that the volume before us is in all respects worthy of their support.

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*Calendar of St. Mungo's College for the Year 1891-92.*

Glasgow: Jas. Macnab.

The Calendar before us is a complete and efficient guide to the college. The monthly record at the beginning follows closely on the lines of the University Calendar, and gives the dates of the various examinations and other functions there. There is one new departure which we think in many respects an excellent one—namely, that the class examinations are announced in the Calendar. We have such items as "December 17. Th. Physiology Class—First written examination." "January 22. F. Surgery Class—Second written examination." This means that each teacher sends in a note of the number of written examinations which he proposes to hold, and that these are apportioned by a single
authority. Such an arrangement will enable the student to map out his work for the session, and will also allow of a distribution of the examinations in such a way as to obviate crowding together at particular periods. It sometimes happens, as our readers are aware, that two or more serious examinations fall in one week.

The Calendar also contains a sketch of the history of the College and the Memorandum of Association. There follows a list of the courses of instruction, with descriptions of the various courses. This is followed by a list of honours and copies of examination papers.


This small treatise is a reprint of a paper which the author contributed to the Illustrated Medical News in 1889, with some additions for the purpose of showing by statistics the results of intubation of the larynx. According to the classification of the author, catheterism of the larynx is discussed in four divisions according to the nature of the stenosis—(1) in diphtheria, (2) in other forms of acute stenosis, (3) in chronic stenosis, and (4) in the treatment of foreign bodies in the air passages.

The author has collected 1,540 cases in which intubation has been resorted to for the relief of patients suffering from diphtheria, in which he shows that 474 cases (307 per cent) recovered. The operation has been most frequently performed at the age of 4 years, with a mortality of 70 per cent; whereas, over the age of 8 years, comparatively few intubations have been performed, and the results, as might be expected, are more favourable than in early childhood. In all forms of acute laryngeal stenosis it seems to us that tracheotomy is to be preferred to intubation; opening the trachea is not in itself dangerous, and we are inclined to believe that tracheotomy will save every case that can be relieved by intubation, and is applicable in many cases where catheterisation of the larynx is useless. In chronic stenosis, however, we may look for more good from his mode of treatment, as, for example, in lesions such as bilateral paralysis of the adductors, cicatricial stenosis, laryngeal spasm, syphilitic stenosis, and oedematous laryngitis.

To those who are not familiar with the method of performing intubation of the larynx, and of the management of
the patient after the operation has been performed, the little book now before us will prove a useful guide, and as such we can highly commend it.


These reports occupy a book of 150 pages, and include twenty-one separate papers on various subjects of interest to the throat specialist. At the roll call twenty-four fellows of the Association were present, and of these sixteen read papers, so that although the Association is a small one, most of the members undoubtedly take an active part in its proceedings. Many of the cases recorded are rare and of considerable interest to the laryngologist, but, collected together as they are, those contributions are not likely to be read by the general practitioner. The transactions show that good work is being done by the Association. We doubt, however, the advantage of such small associations of specialists. Is it not better that these papers should be discussed by a wider circle, such as a sectional meeting of a large medical association?


The structure of the brain is exceedingly complex, and it is difficult, if not impossible, with an ordinary text-book as a guide, to obtain a satisfactory and graphic knowledge of the connections and relations of parts. Modern neurology makes it more and more imperative on those who desire to keep abreast of the times to make themselves familiar with many intricate details in the anatomy of the nervous system. We can recommend the book under review as a full and complete account in such a form as to put within the reach of all who earnestly desire to know, the latest information on the subject. The book being in the form of lectures, is written in a plain and agreeable style. It is impossible in such a subject as this to make it that he who runs may read, but at least the
difficulties are plainly met, and the attentive student need not despair.

The illustrations are copious and exceedingly graphic. Some of them are coloured.

The translators have done their work with great accuracy and judgment. There is little to remind us, in the course of reading, that the work was originally written in German—an agreeable contrast to which one often encounters in translations, especially in American ones.


This volume is the second of a series formed for providing “thoroughly practical and reliable text-books and manuals upon nursing and its cognate subjects.” The editor of the series has done well in selecting the late matron of St. Mary’s Hospital to compile the work now before us. Her practical knowledge of hospital work qualified her for treating the subject in such a manner as to give all necessary information to her readers, without over-burdening the book with technical expressions and information more suited to the surgeon than the nurse, as is so often observed in books on nursing. The arrangement of the book and the text are admirable, and well suited for nurses. We have no hesitation in recommending it highly. The only poor part of the book are the illustrations.


As the two previous editions of this volume were fully reviewed in our pages not very long ago, the present issue does not call for special notice. It is slightly enlarged, a few additional illustrative cases having been inserted. Referring to the Apostoli treatment, the author says—“Little has been heard recently of it, and at present it bids fair to join the long list of ‘cures’ that have left things much as they were before.”
ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

EPIDEMIOLOGY.

BY ARCH. K. CHALMERS, M.D., D.P.H. CAMB.

Experimental Typhoid Fever.—In a communication on the above subject made to the Biological Society of Paris, on 2nd May last, by MM. Gilbert and Gironde, the labours of previous workers in the same field were in the first place reviewed. Pure cultures of Eberth's bacillus have been injected, and the lesions produced have been as varied as the views of observers regarding them. Some observers there are who regard the symptoms thus produced as caused by a septicemia which is rapidly fatal, but is quite independent of the multiplication of Eberth's bacillus in the organism. Others, by similar injections into the veins, the peritoneum, or even into the intestines, have induced an illness lasting from seven to thirty days, accompanied by diarrhoea and emaciation, which revealed to post-mortem examination tunefaction with injection of Peyer's patches, the mesenteric glands and the spleen; while the bacilli were found in large number on the walls of the intestines and in other organs. But they were not able to establish the production of intestinal ulceration, which is still the most characteristic post-mortem lesion of typhoid infection. Some other observers had been more fortunate, and A. Fraenkel had, by an intra-duodenal injection which produced death in the animal on the tenth day, caused in the inferior part of the intestine an ulcer which measured half a centimetre in diameter. Similarly, in a rabbit, inoculated in the veins of the ear and killed on the fourteenth day, MM. Chantenesse and Vidal had seen a small ulcer, lenticular in shape, in the neighbourhood of the ileo-cecal valve; and in the more raised parts of the intestine there were little ulcers covered in the blood-clot. So much being known, the question, however, still remained unanswered, and MM. Gilbert and Gironde proceeded to further experiments, selecting a series of white mice for their investigation.

From this series they have selected two animals whose history bore more directly on the pathogenic value of the typhoid bacillus. The first animal was inoculated with one c.c. of bouillon culture, on 19th December last, under the skin of the back. Diarrhoea and emaciation followed on this, and on the fourteenth day the animal died. In this and in the second animal, dying thirty-two days after injection, the post-mortem appearances were as follows:— Cecum filled with fecal fluid of a greenish yellow colour; the small intestine contained a little mucous liquid, the stomach empty. The small intestine is rose-coloured and injected, its mucous coat swelled and Peyer's patches projecting. Towards the cecum these patches are swollen and ulcerated. These ulcers are deep and round, with a diameter of about a centimetre. The border clean, the base a little unequal and partially coated with clots of blood. There was appreciable tunefaction of the spleen, liver, and of mesenteric glands. These last are especially apparent in the neighbourhood of the cecum.

The histological study of the intestine and of the glands furnishes us with important indications. Section of the intestinal wall at the level of the ulceration shows the base thereof to be composed of cells much thickened and altered. There is a moderate infiltration of leucocytes which encroaches a little on the superficial layer of the muscular layer lying underneath. There are also changes in the vessels—some obliterated, others widened, and the elements of the muscular layers are displaced by an edematous state which gives to this coat an areolar aspect, in striking contrast with the serrated appearance presented by that in its immediate neighbourhood. At the level of the ulceration there existed a very large number of bacilli, pre-
senting in their general aspect a resemblance to masses of the bacillus of Eberth. They form thrombi in the vessels and also masses disposed in the spaces between so close as to resemble felt-work. In the glands the bacilli are much more rare.

Cultures were afterwards obtained from inoculations, made at the atropies, with splenic juice and intestinal liquid, and the tests applied established the presence of Eberth’s bacillus. In summing up, the reporters regard the evolution and duration of the induced disease, the seat and form of the lesions, the recovery of the pathogenic agent in process of multiplication in the organism, as recalling with sufficient clearness the features which characterise typhoid in the human subject. In regard to the facility with which the disease was here induced by injection under the skin, the reporters, while depressing a forced analogy, think that under certain conditions the enteric bacillus may find entrance to the system by other means than the ingesta.—(Gazette Médicale de Paris, 23rd May, 1891.)

On the Poisonous Nature of the Soluble Products in Cultures of the Tuberole Bacillus.—MM. Hercourt and Ch. Richet have conducted a series of inoculations on rabbits, some of which were healthy, while others had been rendered tuberculous by previous inoculation. A sterilised broth culture was used, and the quantity varied from 30 to 35 cubic centimetres. All the previously injected animals died with evidence of pulmonary congestion and hemorrhage, while none of the healthy rabbits were affected. The experimenters conclude that tubercular cultures contain a substance which is toxic for tubercular rabbits, but quite inoffensive to healthy ones. They have further established that this substance is not destroyed by prolonged boiling, or by exposure for half an hour to a heat of 125°. It is dialysable, and may be filtered under pressure through porcelain, and it is not destroyed by prolonged contact with weak acid solutions.—(Gazette Médicale de Paris, 26th July, 1891.)

Note on Vaccination against Tuberculosis: a Communication by MM. Grancher and H. Martin to the Congress on Tuberculosis, Paris, July, 1891.—The varying characters of the tubercle bacillus as found in birds and man respectively are discussed, and the opinion finally expressed is in favour of regarding the two bacilli simply as two species of one microbe. This is contrary to the opinion of Koch, who “admits willingly that the bird bacillus is an independent species, but closely related to the human one,” and to a number of other dualists who seek to establish their belief (1) in the different appearance presented by cultures of each; (2) on their different pathogenic actions; and (3) on the immunity of the dog from the bird bacillus and of the chicken from the human bacillus. In answer to that MM. Grancher and Martin say, that although cultures of fowl bacilli are usually soft and more or less folded, and those of the human bacillus are usually dry and wrinkled, yet the converse frequently happens, and in some fresh cultures of both bacilli it was impossible, from appearances alone, to tell one from the other.

The second assertion is met by the statement, that from the fowl bacillus localised and general tubercular lesions may be seen. Regarding this argument founded on the immunity of certain animals, it is admitted that it would be invaluable were the immunity absolute. But it is not so; besides, several investigators have infected hens with the human bacillus; moreover, the immunity of the dog from the fowl bacillus is purely relative. The work of Pasteur, Koch, and others is referred to, and the authors then retail their own work, upon which follows the conclusion that although they have not succeeded in conferring immunity in rabbits by a method at once inoffensive and safe, there has been one step made in the direction of establishing, by direct experiment, the vaccinal action of the tuberculous virus against itself. “Anti-tuberculose vaccination is imperfect, but it exists.”

A second conclusion is that the attenuated tubercular virus employed as
vaccine contains a vaccinal substance and also a toxic one, which latter causes the nephritic and paraplegic conditions sometimes observed in the animals operated on, while from the former substance there is produced, by a mechanism meanwhile unknown, an immunity more or less perfect, or more or less prolonged, according to circumstances.—*(Gazette Medicale de Paris, 1st August, 1891.)*

**SURGERY.**

**BY HENRY RUTHERFURD, M.B.**

**Fractures of the Skull.**—Knorre, from an elaborate study of 14 cases examined from a medico-legal standpoint by Professor Körber of Dorpat, has arrived at conclusions confirmatory of the theory known by the names of Messerer and von Wahl—namely, that the direction of the force determines that of the fracture, and that the direction in which the force has been applied may, with absolute certainty, be deduced from the direction of the fracture. Knorre, while with von Wahl distinguishing (1) fractures by bursting coinciding with the direction of pressure, and (2) fractures by bending at right angles to the direction of pressure, with Körber *(Centralb. f. Chir.,* No. 7, 1890) divides the former into those which have arisen under bilateral pressure and those which have been produced by pressure applied to one side only, a division which is of no small importance from a medico-legal point of view. Knorre is also of opinion, with Messerer and Körber, that the point of origin of the fracture by bursting varies according as (a) in bilateral compression, with slowly acting pressure the whole elasticity of the skull is called into play; or (b) according as in unilateral compression, as by a fall against some pointed object, the elasticity is only called into play in a limited area. In the former case, where the alteration in shape of the skull is more forcible, the fracture by rupture begins without exception in the equator (of the cranial spheroid); in the latter it begins at the point of application of the pressure or its immediate neighbourhood. Further, in bilateral compression the fracture fissures have a longer course, and the fissure gapes most widely at the middle of its course. In unilateral compression the fractures by bursting have a shorter course; they seldom pass the middle line, and gape at the pole (of the spheroid) or near it. Where the widest gapping has occurred can, as a matter of fact, be determined in many cases only from accompanying circumstances, such as rupture of the dura, inclusion of fat or of hair.

Fractures by bending encircle the pressure pole, and involve the external lamina more widely than the internal. The area of bone circumscribed by them is frequently depressed. Finally, a number of Knorre's observations support the view of Körber, that in cases of widely applied violence by a body of irregular surface pressure poles arise at all points at which the two bodies are in contact, to which, again, various axes of pressure correspond. Consideration of this fact enables us to apply the theory of fracture by bursting and by bending bone to those cases apparently beyond all possibility of classification *(Félixet, Fractures à Grand Fracas; Hermann Schädelbrüchen, mit unangegreifchen Frakturtypus).*—Knorre, Inaug. Diss., Dorpat, 1890; *(Centralb. f. Chir.,* 1890, No. 38.)

**Ätiology of Cancer.**—Schuchardt, reviewing Hauser's monograph on *Cylinder-celled Carcinoma of the Stomach,* &c., considers the various theories which have been adduced.

He agrees with Hauser in setting aside the infection theory and the hypothesis of a still undiscovered cancer bacillus. In all “infective tumours” produced by micro-organisms, and all other new tissue formations brought about by parasites, we have to do merely with a growth of the local tissue, and the metastases of such infective tumours are never found proceeding
from a growth of cells which have escaped from the primary mass. On the contrary, the metastatic formations arise solely by the action of escaped microorganisms upon the tissue in which they come to rest, just as in the case of the primary mass. The successful transferrings of carcinoms from one animal to another (Hanau) are to be regarded merely as transplantations with further growth of the transplanted tissue, and show nothing more than that the cancerous epithelial cells may, under favourable circumstances, continue to grow after transplantation to another organism. Of a true communication in the sense of the infectious theory, it were only possible to speak when by inoculation of a micro-organism, or the implantation of a living tissue containing it, the tissues of the new host were themselves incited to cancerous growth.

Cohnheim's inclusion theory considered by Hauser now as untenable has for Schuchardt this recommendation, in the first place, that it was the first truly universal theory of tumour formation, although it consists neither with the irritation theory nor with Thiersch's hypothesis of a disturbance of the histogenetic balance between the epithelial and connective tissues—namely, by senile alteration on the part of the connective tissues with persistent formative activity on the part of the epithelium. Cancer is, however, by no means a disease peculiar to old age—developing, as a matter of fact, most frequently in the 10 years between 40 and 50. Such a disturbance of balance, if it be present, must alter the whole surface of contact (be present, that is, all along the line), and can at best only serve as a predisposing cause to favour the development of a cancerous tumour. The local causes it has long been customary to find in chronic inflammatory processes which sometimes precede cancer for years, and then suddenly or gradually develop into it.

For Schuchardt, however important these things may be as conditioning causes, it is not to be forgotten (1) that they are only demonstrable as such in relation to certain well recognised and defined types of the carcinomata; (2) that by far the greater part of the carcinomata, and especially most of those occurring in the stomach and intestine, arise without precedent chronic irritation. Most internal cancers come like a thief in the night, without warning.

The irritation theory, then, is not one of universal applicability; but even in the cases where chronic inflammatory processes have been in existence, the chronic irritation can only be regarded as a local predisposition to cancer formation. The actual cause, the unknown x (Volkmann), which must accompany the atypical epithelial proliferation is not brought one step nearer to our knowledge by the irritation theory. (Zentralblatt. f. Chir., 1891, No. 38.)

**Temporary Resection of the Cranial Vault.**—Mellinghof reports a case under the care of Professor Burns in Tübingen, and refers to a considerable number which have been recorded since the procedure was introduced by Wagner in 1889. The first suggestion in the matter, however, refers to J. Wolff, who experimented on dogs in 1860, and reported favourably of the proceeding in the Arch. für. Klin. Chir., vol. iv. Wagner's procedure is as follows:—Incision down to the periosteum in the form of a Greek Omega, as this flap retracts, the knife divides the periosteum by a parallel incision about 1 cm. nearer the centre of the flap. Along this line the skull is chiselled through obliquely as far as the base of the flap. At the bottom of the lateral limbs of the omega a groove is cut in the bone to allow the convenient application of a fine narrow chisel to the base of the bony flap, which is divided subcutaneously without injury to the soft parts covering it.

The detail of the lateral limbs is only of importance in removing large pieces; otherwise the section of the pedicle is effected without them. Wagner also recommended the use of circular saws worked after the manner of dental drills. These, again, are specially useful in the case of large pieces to diminish the risks from hammering on the head.

A modification of this procedure was proposed by Müller, which is an adaptation of König's operation for rhinoplasty. Müller raises up merely the
tabula externa and a part of the diaphysis, and then carefully chisels through and
removes the tabula interna. By this means the operator is better able to
judge of the thickness of the internal table. The procedure has been success-
fully employed both by Müller and König.

Lauenstein reports a case operated on by Wagner’s method, and the patient
having died some time afterwards of hydrocephalus interna, the skull, with
the reunited piece, was shown by Lauenstein at the Nineteenth Congress of
German Surgery.

Two successful and highly satisfactory results are recorded by Wagner
(Centralb. f. Chir., 1891, No. 2) in children of 7 and 3 years respectively.

Salzer, in Billroth’s clinic, strongly advocates the use of the mechanical saw
in order to avoid concussion, a point which is specially of importance in cases
of abscess.

Finally, Benda showed at the 20th Surgical Congress a young man in whom
the operation had been successfully performed for excision of a portion of the
cortex in traumatic epilepsy.

Mellinghof, following Wagner, recommends the procedure (1) as eminently
superior to trepanning for exploratory purposes; (2) as avoiding the osseous
defects which are apt to follow the ordinary trephining methods. — (Beiträge
zur Klin. Chir., Bd. vii, Hft. 3.)

Early Operation in Pott’s Disease of the Spine.—Chipault
reports four cases in the service of M. de Saint Germain:

1. Case in which Treves’ operation was performed prior to the development
of any cold abscess, for disease of the lumbar bodies extending towards the
left so as to compress the roots of the sciatic nerve at the level of the intra-
vertebral foramina. Pain was felt in the distribution of the peroneal, and
accordingly it was supposed that pressure was being exerted upon the 4th
and 5th lumbar and the 1st and 2nd sacral nerves. A sequestrum was found
on the front of the body of the 4th lumbar vertebra, besides tubercular
granulations around it, below and to the left. In front of the cavity the aorta
could be felt beating. From the fifth day the pain and lordosis disappeared, and
patient made a good recovery.

2. Three cases of laminectomy for disease in the bodies, with removal of
any ridge formed by the collapsing bodies, clearing out of the tubercular
cavities, and subsequent drainage by way of the vertebral canal. In two of
the cases very distinct improvement was obtained.

Two points are of importance—(1) The lamina must be cut away down to
the intervertebral foramina; (2) After the cord has been exposed, it must be
relaxed by extension of the spine—that is, by placing cushions under the
patient above and below the seat of curvature, so that the cord in its sheath
can be drawn to one side, and the bodies made accessible. —(Rec. de Chir.,
July, 1891.)

DISEASES OF THE THROAT.

BY JOHN MACINTYRE, M.B.

Intra-nasal Surgery in Cases of “Necrosing Ethmoiditis.”
—At the last meeting of the British Medical Association an interesting dis-
cussion took place on the position of intra-nasal surgery. A good deal of
attention has of late been devoted to this subject, particularly with reference
to the removal of the turbinated bones, a method advocated for the most part
in this country by Dr. Woakes. This gentleman showed 20 specimens of
turbinal bodies which had been removed from living patients; but Dr. Wm.
Hill pointed out that only 2 of the 20 specimens showed true disintegration of
bone, and maintained that in 18 out of the 20 cases the turbinal body had been
removed with insufficient evidence of the disease.
Atrophic Rhinitis.—Dr. Phillips recommends that the nostril should be sprayed with an alkaline solution, and afterwards thoroughly cleaned by cotton wad. After drying, a 5 per cent of kerosine-ichthyol solution is to be applied on a cotton applicator. Constitutional treatment is to be combined, and any necrosed parts to be removed.—(New York Medical Journal, 23rd May, 1891.)

Astringent Gargles.—The American Journal of Pharmacy gives the following formula for Goddard’s astringent gargle:

Fol. roseæ rub., 2 dr.
Aqua bullantia, 5 oz.
Acidi sulphurici dil., ¼ dr.

Infuse, when cold strain, and add—
Mel. despumati, 1 oz.
Acidi tannici, 2 scr.
Aluminis, 2 dr.
Spir. vini rectificati, 6 oz.—M.
Aqua rosea, 6 oz.

Another gargle is as follows:

Red rose petals, 2 dr.
Pomegranate rind, 4 dr.
Boiling water, 6 oz.

Infuse, strain, and add—
Alum, 2 dr.
Clarified honey, 1 oz.

Mix, filter.

Intubation of the Larynx.—W. Waxham, in the Archives of Pediatrics for July, 1891, gives the following statistics, which will be of interest:

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<th>Cases</th>
<th>Recoveries</th>
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Aged

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Total: 343 | 123 | 35.85 per cent

First 100 cases, 27 recoveries, or 27.00 per cent.
Second 100 cases, 34 recoveries, or 34.00 per cent.
Third 100 cases, 42 recoveries, or 42.00 per cent.
Last 43 cases, 18 recoveries, or 41.85 per cent.
Treatment of Tuberculosis.—Grüttner (Münchener Med. Woch., No. 28, 1891) has treated ten cases of this affection with causticardate of potash. The doses were 0.0001 to 0.0005 gramme. The results were so discouraging that the method was abandoned.

Aristol in the Treatment of Nasal Affections.—Dr. P. Heyman recommends insufflations of aristol in òzena. (Laryng. Gesellschaft in Berlin, 17th July, 1891.)

Dr. Phillips, in the New York Med. Jour. for 23rd May, 1891, recommends this agent also. In cases of atrophic rhinitis it may be used as an insufflation, or in the form of a spray in liquid petroleum products.

New Literature.—"Atlas der Krankheiten des Mundes und der Rachenhöle." (Mikulicz, Breslau, and Michelson, Königsberg.)


"Vorlesungen über die Krankheiten des Kehlkopfes, der Luftrohre, der Nase, und des Rachens," von Professor Dr. L. Schröter.

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GYNÆCOLOGY AND OBSTETRICS.

By E. H. LAWRENCE OLIPHANT, M.D.

Prophylaxis of Puerperal Fever.—J. Veit (Berlin, Klin. Wochen., 11th May, 1891) contributes an important paper on this subject, advocating almost complete abstinence from internal examination in attendance on labour. The external examination yields the position of the fundus, of the child and of the head, the condition of the child, of the mother, and of the membranes; and, if these are all normal, no internal examination is necessary. The indications for internal examination in the first period of labour are—(1) General disturbances—e. g., eclampsia, nephritis, fever, &c.; (2) Local disturbances—e. g., discharge of blood, abnormal painfulness of labour or long duration; (3) Departure from the normal in external examination—e. g., position of head above pelvis in primiparum or after escape of waters in multiparum, abnormal distension of lower uterine segment, slowing of foetal heart sounds, &c. In the second stage of labour internal examination is only rarely indicated, and really only when the question of operative aid arises. In the third stage internal examination should only be made when there is excessive hemorrhage, and in the puerperium only in fever or hemorrhage.—J. K. K.

Vaginal Hysterectomy for Cancer.—E. W. Cushing (Annals of Gynecology and Pediatry, June, 1891) gives statistics of 21 cases in which he has performed vaginal hysterectomy for cancer. Of the 21 cases, 13 still survive, or about 62 per cent. In only 17 of these, however, was he able to get beyond the palpably diseased tissue, and this gives 76 per cent of recovery in such cases. Of the cases which were operated on more than a year ago, 64 per cent survive. His statistics give renewed support to the advocates of early and total extirpation for cancer of the uterus.—J. K. K.

Varieties in Human Milk.—Dr. Rotch, in the Archives of Pediatrics for November, 1890, quoted in Dublin Jour. Med. Sc., August, 1891, gives the following table of typical analyses of normal milk, from a woman leading a healthy life as regards exercise and food; of poor milk (starvation), of over-
rich milk (rich feeding, lack of exercise), and of bad milk (pregnancy, disease, uncontrolled emotions, &c.):—

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Poor</th>
<th>Over-rich</th>
<th>Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat,</td>
<td>4·0</td>
<td>1·50</td>
<td>5·10</td>
<td>0·80</td>
</tr>
<tr>
<td>Albuminoids,</td>
<td>1 to 2·0</td>
<td>2·40</td>
<td>3·50</td>
<td>4·50</td>
</tr>
<tr>
<td>Sugar,</td>
<td>7·3</td>
<td>4·00</td>
<td>7·50</td>
<td>5·00</td>
</tr>
<tr>
<td>Ash,</td>
<td>0·2</td>
<td>0·09</td>
<td>0·25</td>
<td>0·09</td>
</tr>
<tr>
<td>Total solids</td>
<td>12 to 13</td>
<td>7·09</td>
<td>16·35</td>
<td>10·39</td>
</tr>
<tr>
<td>Water,</td>
<td>88 to 87</td>
<td>92·01</td>
<td>83·65</td>
<td>89·61</td>
</tr>
</tbody>
</table>

The result of taking too much food and too little exercise is an excess of albuminoids. The accompanying table shows this. The analyses are of the milk of a healthy nurse at various times. During Period I she was poorly fed, during Period II she had rich food and little exercise for a month, and during Period III her food and exercise were regulated:

<table>
<thead>
<tr>
<th></th>
<th>Period I</th>
<th>Period II</th>
<th>Period III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fats,</td>
<td>0·72</td>
<td>5·44</td>
<td>5·50</td>
</tr>
<tr>
<td>Albuminoids,</td>
<td>2·53</td>
<td>4·81</td>
<td>2·80</td>
</tr>
<tr>
<td>Sugar,</td>
<td>6·75</td>
<td>6·25</td>
<td>6·80</td>
</tr>
<tr>
<td>Ash,</td>
<td>0·22</td>
<td>0·20</td>
<td>0·14</td>
</tr>
<tr>
<td>Total Solids</td>
<td>10·22</td>
<td>16·50</td>
<td>15·14</td>
</tr>
<tr>
<td>Water,</td>
<td>89·78</td>
<td>83·50</td>
<td>84·86</td>
</tr>
</tbody>
</table>

Lotion for Chapped Nipples.—The same journal, quoting from a French source, gives the following formula:—Balsam of Peru and tincture of Arnica, of each two parts; of sweet oil of almonds, thirty; and of lime water, fifteen parts. Mix and apply to the nipple on the removal of the child from the breast.

The Effect of Removal of the Ovaries on the Ciliated Epithelium of the Genital Tract (Centralb. f. Gynæk., No. 22, 1891). At the Gynaecological Meeting at Bonn Dr. G. Krukenesber of that town read a paper on the above subject. Bischoff and others have established the fact that only the tubes have ciliated epithelium in childhood, the uterine mucosa from puberty onwards; while after the climacteric (as Klob has shown) the cilia disappear. It was accordingly of interest to enquire whether the cilia perished in the premature menopause resulting from castration. The examination of a castrated woman can lead to no definite conclusion on the subject, seeing that ciliated cells would not as a rule be found in cases of endometritis, which almost always exists before the operation. Experiments were accordingly made on lower animals, in some of whom only the cervical epithelium is ciliated, while in others the uterine cornua are also ciliated. For about seven months after castration the uterus maintained its normal weight, and the ciliated epithelium remained unchanged. After nine or ten months the uterus showed an appreciable loss of weight, while the cilia began to disappear from the uterus and from the tubes. The co-existing closure of the abdominal ends of the tubes, which always takes place at this time, may be taken into account in regard to the disappearance of the tubal cilia, but not that of the uterine cilia; besides, we see this last associated with the atrophy of the uterus, and we know, from the researches of Kehrer, that closure of the tubes does not lead to atrophy of the uterus. Castration accordingly acts on the uterus in the same way as the menopause—the ciliated epithelium disappears, but only after the uterus has become atrophic. The ciliated epithelium does not form in an animal castrated very young.

Ichthyol in Gynaecological Treatment.—Dr. H. W. Freund of Strassburg, in the Berlin Klin. Woch., quoted in Centralb. f. Gynæk., May,
1891, gives an account of the results he has obtained in his practice with this substance. Applying it on gycrine pads in the vagina, he has found it of value in promoting the absorption of exudations which had obstinately resisted other treatment. He used it also with good results in the treatment of both cervical and corporeal endometritis. For the former he applied the ichthyll glycerine pads to the fornices till the cervical swelling had gone down, then painted the cervix freely through a speculum. In corporeal endometritis he obtained a complete cure in three cases that had previously always relapsed after other methods of treatment—even after curetting. He washed out the uterus, then swabbed it out with pure ichthylammonium. Besides its application to pelvic diseases, it is further recommended for hatched nipples. Pure ichthyl-zinc is applied directly to the nipples after washing. The drug must be washed off again before the application of the child to the breast. By these means the pain was remarkably relieved, and all the cases were healed in from two to five days.

The Technique of the Induction of Premature Labour.—Dr. Treub of Leiden discusses this subject at length in the Archives de Tocologie, June and July, 1890. He passes over many of the well known methods, merely mentioning them to condemn them. In referring to the simple puncture of the membranes, he says this has always been condemned on theoretical grounds by the majority of accoucheurs, though in the hands of those who have adopted it (E. Braun of Vienna, &c.) this method has given very good results. The use of “Barnes’ bags,” he says, is not sufficient to bring on labour. Dr. Barnes does not induce labour with these instruments, but delivers artificially (accouchement forcé et non un accouchement provoqué). The introduction of an elastic bougie, or what he calls Krause’s method, is insufficient and uncertain; in the earlier days of this procedure labour came on pretty rapidly after the introduction of the bougie; but, unfortunately, sepsis also followed only too commonly. Now this danger no longer exists in practice, and a physician who loses a patient from septicaemia after the introduction of a bougie should consider himself criminally responsible. But with this freedom from sepsis is associated an uncertainty in the success of the operation. The pains may not come on for several days, and Dr. Treub has occasionally seen cases where labour came on only after the waters had drained away through a slow perforation of the membranes by the pressure of the bougie. He does not wish it to be thought that he means to imply that an aseptic bougie will not induce labour quickly in an easily irritable uterus, but that there are many torpid uteri where the bougie will excite pains only after a considerable interval. He had tried small injections of iodine or of turpentine between the membranes and the uterine walls, but these had entirely failed in procuring the desired result. Tarnier’s method of inserting a balloon into the uterus, just above the internal os, is condemned on account of the difficulty of introduction in primiparae and of its tendency to displace the presenting part of the child, with a tendency to produce a malformation, or there is at least a loss of force when the presenting part is longer in the direct line of the passage; the balloon, besides, is apt to be extruded, and may require to be replaced. These arguments apply still more strongly to the modification of Tarnier’s method, in which the balloon is increased in size from that of a small egg to that of a fetal head.

Dr. Treub’s own method, and the one which he describes in detail, is to insert a small bag into the uterus outside the membranes as high as possible; this is then blown up, and labour comes on naturally and safely. His apparatus is easily made, and so cheaply that a new one can be used on each occasion, thus rendering antisepctic precautions more easy. It consists of a condom rendered thoroughly aseptic, and secured over the point of a No. 4 catheter. The catheter should be cut at the end so as to have its orifice at the point. This is inserted into a hollow bougie three-eighths of an inch in diameter (No. 30 Charrière’s scale). An ordinary gum elastic bougie will do; but the point of this is apt to be rough where it is cut, and it is not so smooth
Inside as one made of celluloid; and it should be so much shorter than the inner tube as to allow the distal point of this last to be visible when the bag is entirely protruded at the other end. The whole apparatus is carried as high as possible into the uterus, sliding gently between the membranes and the uterine wall. Except in primiparæ this is easily done if the instrument be previously given the proper curve. The celluloid bends easily if warmed in hot water, and the requisite bend can be maintained by dipping in cold water. Dr. Treub operates through a bivalve speculum. When the instrument is pushed sufficiently high the point of the condom is extruded from the outer guiding bougie, and the condom is at the same time distended with fluid through the inner tube by a syringe. The outer tube is gradually removed as the bag attains its full size. The distal end of the inner catheter is closed, and the outer tube being removed, the vagina is lightly filled with iodoform gauze.

In fourteen cases where this method was tried, labour was completed in thirty-one hours from the introduction of the bag. In one case a slight haemorrhage, produced during the introduction of the sound, was checked by the distention of the bag. The large size of the sound is confessedly against its introduction in some, if not most, primiparæ. If it cannot be introduced, the cervix may be tightly packed with iodoform gauze. This method succeeds better in primiparæ than in multiparæ.

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**Books, Pamphlets, &c., Received.**


**Burdett’s Hospital Annual and Year-Book of Philanthropy,** 1891-92. London: The Hospital (Limited).


THE
GLASGOW MEDICAL JOURNAL.

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ORIGINAL ARTICLES.

THE TREATMENT OF ABORTION.

By J. K. KELLY, M.D., F.F.P.S.G.

The question of treatment in abortion naturally presents itself in two divisions—1st, Can we prevent its occurrence? 2nd, If we cannot prevent its occurrence, how shall we best prevent it from producing injurious effects?

The preventive treatment will naturally be guided by the cause wherever the cause is discoverable. Where, for example, the abortion is traceable to syphilitic disease, the efficient treatment of syphilis will prevent its recurrence. Where, again, it is due to endometritis, the cure of the endometritis will prevent it. The problem of prevention, indeed, is simply the problem of maintaining or of restoring the condition of both general and local health in the woman who is to become or who is already pregnant.

This condition of health may be menaced by almost any disease. Acute diseases, such as rheumatism or pneumonia, in which the danger perhaps lies in the high temperature, or fevers, where the danger may lie in the severity of the infection as well as in the height of the temperature; chronic wasting diseases, such as pulmonary phthisis, in which, perhaps, the condition of the blood as well as of the tissues is at fault; mental shocks, which may act by influencing either the circulation or the innervation of the uterus and its
contents; local conditions, such as a myoma, an ovarian cyst, a parametritis, or a uterine displacement, by preventing the due expansion of the uterus, or an endometritis, by rendering the uterus incapable of forming a healthy decidua; all these, and many other both local and general conditions, may require to be remedied before we can successfully avert the risk of abortion. But in the discussion of the subject we must evidently confine ourselves within a narrower range.

One is strongly tempted to maintain that in all cases abortion is due to a diseased local condition, but it would in many cases be a mistake were we to attempt a local treatment. The only cases, in fact, where a local treatment for the prevention of abortion is indicated are those in which there is a lesion arising from the action of local causes. As illustrating such cases, I will cite a case of retroflexion of the uterus, not because retroflexion is by any means the most common cause of abortion, at least in such a pronounced form as this case showed, but simply because it is of recent date, and is in itself interesting.

Mrs. B., pregnant three months, having already had three children, and one miscarriage between the second and third, sent for me on 7th April. For some days she had had some difficulty in micturition, and this morning she had found it quite impossible to pass water. On examination I found the hypogastrium tensely distended by the urinary bladder, from which I removed a great quantity of urine by using the tube of an infant's feeding-bottle for a catheter. The cervix uteri was firmly pressed against the urethra, and the fundus bulged down the posterior fornix of the vagina. After emptying the bladder it was not difficult to bring the cervix downwards by hooking the forefinger in front of it, while the fundus was raised out of Douglas' pouch by the middle finger, and carried forwards to its proper situation behind the pubis. As I had no pessary with me, I left her with directions to rest till I saw her next morning. On my return, I found the retroflexion had returned, and the passage of urine was again obstructed. The uterus was restored to its normal situation, a Hodge pessary introduced, and the pregnancy went on uninterruptedly to the full term.

As a contrast to this case, in which the retroflexion was reducible and the abortion was prevented, I may give brief notes of a case which terminated differently:

On 12th May I was asked by a colleague to see Mrs. M., about two months pregnant, and suffering apparently from intestinal obstruction. This obstruction was unrelieved by
large injections, though they brought away some faecal matter. The woman had a constant inclination to defaecate, and occasionally could not help bearing down as if in the second stage of labour. The feeling of obstruction was apparently caused by the fundus of the gravid uterus pressing deep in Douglas' pouch, and so firmly fixed there that no means we adopted, even under chloroform, could raise it. There was no obstruction to the urine, the pregnant uterus not yet having reached a size sufficient to press on both urethra and rectum. In this case the woman was relieved of her symptoms only when abortion occurred, and when the uterus was completely emptied of its contents.

By far the most common local cause of abortion is endometritis, but when endometritis exists it is hardly possible to adopt an effective treatment after pregnancy has begun, though even then rest and tepid antiseptic vaginal douching is sometimes of service. To prevent abortion in endometritis, we must start the treatment before the occurrence of pregnancy.

Leaving, however, this subject of remote prevention, what means are we to adopt when the abortion is actually threatening—i.e., when symptoms are present indicating that such is the case?

There are here two distinct classes of cases which, however, unfortunately are not yet clinically distinct. There are, firstly, cases in which the abortion is inevitable, where, for instance, the ovum is already dead, and pregnancy at an end, and where, therefore, the prevention of abortion is impossible, and even undesirable if it were possible, for in these cases abortion is the only proper termination. On the other hand, there are cases in which the ovum is not dead, where the continuance of pregnancy is still possible, and where, therefore, treatment may quite properly be adopted with a view to prevent abortion.

In the absence of any clue to the clinical distinction of these cases, it is universally admitted that we should always act as if the continuance of pregnancy were still possible, especially when such action in itself involves no risk to the woman. This action is directed against the two main factors in the process of abortion—viz., uterine spasm and hemorrhage. If we can control these factors we shall be able to prevent the abortion in those cases where prevention is still possible. The chief agents used for this purpose are naturally

1. Complete rest on the part of the patient;
2. Opium in some form to control the spasms; and
3. Ergot to control the bleeding.

All local treatment, on account of its tendency to excite
farther uterine action, should be avoided, except in the cases
where some remediable local condition, such as retroflexion, is
the direct cause of the illness.

How long should we persist in this endeavour to prevent
the abortion? Cases have been recorded, though I do not at
present remember to have seen one, in which, after the ovum
protruded at the os externum, it has receded, the abortion has
been prevented, and pregnancy has gone on. Cases like
these render any rule doubtful, and in this, as in almost all
treatment, the decision must be left to the physician's
judgment. In general, however, I think we may say that
the abortion will go on

(1) If the hæmorrhage has been free;
(2) If the pains are regularly recurrent and severe;
(3) If the os is dilated; and
(4) If the ovum protrudes.

So long as only three of these four conditions are present,
there may still be some hope of prevention.

If, however, from the presence of all four we are led to
abandon hope of preventing the abortion, how shall we
proceed to conduct it to a conclusion with the slightest
injury to the patient?

The dangers of abortion lie in various directions—(1) The
hæmorrhage may be so excessive as to be in itself a source
of danger; (2) If the ovum is not expelled whole, fragments
may be left in the uterus, and may cause (a) hæmorrhage, (b)
septic infection, and (c) endometritis; (3) The patient is prone
to take insufficient care afterwards, and subinvolution, with
all its evil results, is very apt to follow; (4) To these we must
add another danger connected with the treatment, that of
septic infection, a danger which always attends manipulations
of the uterus in pregnancy and labour.

To avert these dangers, the one supreme rule is to empty
and cleanse the uterus as soon as possible.

In general, however, we may refrain from interference
when the ovum retains its integrity. In that case the uterus
itself is best suited to drive the ovum into and through the
cervix, and so to bring the abortion to a favourable termina-
tion, and by abstaining from interference we evade the risk
of introducing foreign matters into the genital passages, a
risk which is always great during labour, either premature
or at the full term.
But in many cases the ovum ruptures early in the abortion, the cervix is not dilated by the tense membranes, and the uterine spasm is expended in compressing the contents of the uterus, rather than in opening up the cervix. The uterus, therefore, is at a disadvantage in its efforts to expel its contents, and very frequently fails to do so, and naturally it will fail all the more readily the smaller the body to be expelled. It is in these cases that assistance is required.

Where the larger part of the ovum is retained in utero it is usually possible to introduce the finger through the cervix, so as to clear out the uterine cavity. By the hand on the abdomen the uterus can usually be pressed down well within reach of the fingers introduced per vaginam, but where this is not feasible we may either bring the cervix down by a volsella, or introduce the hand into the vagina, in either case using chloroform if necessary. It will be found, however, that while chloroform is required in almost all cases where the hand is introduced, it is very seldom required for the use of the volsella—the pain caused by catching the cervix and drawing it towards the vulva being very slight. When the uterine cavity is brought within reach by either of these methods, the finger is undoubtedly the best instrument for use in emptying it. It is sensitive, flexible, or firm at will, soft, and at the same time provided with a hard, sharp-edged nail, which can be used as a curette if necessary.

In some cases, however, even when the larger part of the ovum is retained, the cervix does not permit of the passage of the finger. It is then necessary to dilate it before we can terminate the abortion. For this dilatation we may adopt either of two methods—that of slow, or that of rapid dilatation. The former has been long in use, and is, perhaps, still the more common. Whether it be conducted, however, by means of tents or of tampons, the risk of sepsis is always considerable in slow dilatation, and, wherever possible, rapid dilatation of the cervix is for this reason preferable. Another reason for preferring it also is that the patient is sooner relieved of her burden, sooner brought into the condition of convalescence.

Perhaps, however, the most troublesome cases are those in which the larger part of the ovum has already left the uterus, and where the presence of ovum remains, is manifested chiefly by the frequent recurrence of hæmorrhage, and usually, also, by some febrile reaction. In these cases it is usually unnecessary to dilate the cervix for the admission of the finger. The offending material is usually small in quantity, and frequently adherent to the uterine wall. The better
method of removal, therefore, is to clear the whole uterine surface by means of the curette, and to wash out the debris through the uterine catheter. This is the best treatment in all those later stages of abortion, where the retained decidua is decomposing or causing haemorrhage, and where the patient is constantly on the verge of some serious septic infection, which may be manifested either as a local inflammation or as a general toxemia. In such cases there is no need for further dilatation than merely to admit the passage of the curette, there being no large body in the uterus requiring a dilated cervix for its removal.

As this method of treatment by the curette is less known in this country than it ought to be, and, as it is undoubtedly the best treatment for these cases, I may be allowed to describe it briefly.

It is not necessary to put the patient under chloroform, though, in some cases where she is timid or irritable, it may be advisable to do so. Whether anaesthetised or not, she should be put on a table, with her buttocks close to the edge, and her hips arranged almost as in the lithotomy position, the knees being carried well up over the abdomen and widely separated from each other. The vagina is then opened by a broad speculum, and the cervix brought down and fixed by one or two hooked forceps attached to one or both lips of the os uteri. Then, while a constant stream of carbolised or other antiseptic solution plays on the parts, the curette is introduced gently into the uterus, and systematically applied to the whole interior surface. The best curette to use is Martin’s modification of Roux’s. It is not blunt, and yet has no cutting edge; it is firm and reliable, and it can be guided exactly to any region where you wish to apply it. In the process of curetting, for example, it is not uncommon to find some special spot where irregularities on the surface indicate that something is still adherent there, and by this curette we can apply as firm a pressure as we please while scraping this spot, without any risk of the instrument bending under the pressure.

When we have satisfactorily scraped the whole interior, we ought carefully to wash out the cavity with antiseptic solution. If the case has been marked by haemorrhage, or if the uterine wall is much relaxed, this solution should be as hot as it can be borne—about 120° F.—and should be continued till the uterus has contracted firmly. A hot solution, indeed, is advisable in all cases, but I would utter a warning that if the patient is under chloroform we should be careful to
ascertain its heat for ourselves, as in one case I was alarmed to find that the solution I used was so hot as to scald my patient, and though there were ultimately no bad effects, the accident naturally caused me a good deal of anxiety.

Besides this hot solution it is sometimes advisable to use an astringent and caustic application—like liq. ferri perchlor., or carbolic acid, or liniment iodi, if the case has been of long standing and marked by distinct septic symptoms. This caustic may be introduced either on a Playfair's probe wrapped in cotton, or by the small Braun's syringe—15 or 20 drops being sufficient to act upon the whole surface desired.

I wish to press this method of treating abortion upon the attention of practitioners, and to recommend it as incomparably the best we yet know. It is easy of application and it is effective. It thoroughly removes the materies morbi, and leaves nothing to chance. In most cases there is no bleeding whatever after the operation is completed. There is no lochial discharge, seeing there is no decidua left to form lochia. If we did not consider it presumptuous, indeed, we might be tempted to say that after this operation the uterus is put in a better position than when it is emptied by the natural powers themselves. And I might conclude simply with the assurance that, if this treatment be adopted, it will be found thoroughly satisfactory. But there are three objections which have been brought against it, to each of which a few words of answer must be given.

In the first place, it is alleged that there is danger of perforating the uterus by the curette. But even with the softened wall of a pregnant uterus, I can hardly imagine anyone using violence enough to penetrate it with such a curette as this. After labour at the full time there is more risk of such an accident; but in the instances in which I have found the curette necessary after labour at term, I have been as fully satisfied with it as after abortions. Indeed, there is nothing in the results of therapeusis more gratifying than the immediate cessation of puerperal haemorrhage, putrid discharge, and pyrexia after the use of the curette and the hot intra-uterine douche in these cases.

In the second place, a fear has been expressed that by curetting away the uterine mucous membrane we may destroy the possibility of the woman again conceiving. Such a fear is quite natural, and can only be overcome by the result of experience. Of experience, however, there is now no lack to demonstrate that not only is conception possible after such
curetting, but that the uterus is restored to the healthy state most favourable for its occurrence. I have myself had several cases in which women who had been subject to abortions have borne children at the full time after the use of the curette.

Thirdly, the objection is made that after curetting there is danger of pelvic inflammation. This is an actual danger in all uterine therapeutics, but it is also a danger which attends the process of abortion itself. It will be hard, in fact, if parametritis does occur, to determine whether it is due to the treatment more than to the disease. In all cases, however, this danger will require us to use the utmost gentleness; and perhaps of even more importance than gentleness is the strict observance of all antiseptic precautions. In my own practice I have had one case of parametritis post-abortum in a woman who miscarried while her children were ill with scarlet fever, and in whom the curette had to be used. It would be wrong, I think, in this case to attribute the pelvic inflammation to the curette rather than to the other circumstances of the case.

THE PATHOLOGY OF MEDIASTINAL TUMOURS, WITH SPECIAL REFERENCE TO CLINICAL DIAGNOSIS.

By JOHN LINDSAY STEVEN, M.D., Assistant Physician and Pathologist, Glasgow Royal Infirmary.

(Concluded from p. 177.)

DIAGNOSIS AND TREATMENT.

In the foregoing sections of this essay I have described in some detail the more common varieties of new growth that are likely to occur in the mediastinum, and it now remains to sum up what has been written by making a few remarks upon diagnosis and treatment.

In the diagnosis of mediastinal tumours, as I have already pointed out, nothing helps us more than an intimate knowledge of their pathological anatomy. In the detection of solid growths within the chest the careful study of the pathological anatomy is quite as important as the determination of the physical signs; and it is to the demonstration of the assistance afforded us by the study and investigation of the former,
rather than of the latter, that I mean chiefly to address myself in the remarks upon diagnosis. As the physical signs are the direct result of the anatomical changes produced, it naturally follows that, given an intimate knowledge of these changes, the physical signs can be thoroughly understood and, to a certain extent, anticipated. I shall, therefore, not deal with the physical signs per se, but with the physical changes in structure giving rise to them.

The establishment of the diagnosis of intra-thoracic solid tumours naturally resolves itself into two parts—

1. The determination of the presence of a solid tumour in the chest;
2. The determination of the variety of tumour which is present.

In the first place, the solid tumour has to be distinguished from other morbid conditions within the chest, which may give rise to similar signs and symptoms. Roughly speaking, the physical changes induced by the development of a solid tumour in the mediastinum, which are available for diagnostic purposes, arise from the effects of pressure, and these effects are of two kinds—

1. Pressure effects pure and simple;
2. Pressure effects accompanied by structural alterations in the neighbouring tissues set up by the vital action of the tumour.

It is necessary to distinguish between these two conditions, because by strict attention to the points of difference we are aided in our efforts to differentiate the various morbid states giving rise to them. Pressure effects pure and simple may occur without any marked reactionary alteration in the neighbouring tissues other than simple atrophy, and they may be caused by other morbid states than the formation of a solid tumour. Thus, an aneurism or a benign growth of the mediastinum (e.g., the rounded spindle-celled tumours met with in children, see page 32) may in the process of growth do nothing more than cause simple atrophy of the neighbouring structures, with, of course, the resulting functional defects. Malignant sarcomatous growths, upon the other hand, produce changes in the neighbouring tissues, which cannot be regarded as the mere effects of pressure alone, but which are due quite as much to the characteristic infiltrating action of the primary growth. From this cause the second variety of pressure effects are more serious and more constantly present than the former, the pernicious effects of which are, to a certain extent, dependent upon
more or less accidental external and internal circumstances. An aneurism or a benign solid tumour will only give rise to pressure effects when it has attained a certain size, or when the pressure can be applied in such a manner as to develop the signs by which the fact of injurious pressure can be recognised. Thus, an aneurism of the transverse portion of the aortic arch, from its anatomical situation, and from the close packing together of important structures within a small bony circle, is much more likely to cause alarming pressure effects than one of any other portion. Varicosity of veins and localised oedema are relatively rare in cases of aneurism, because the veins, though pressed upon and dislocated, are not very likely to be crushed against resistant points, and so the blood still circulates through them.

Pressure effects of the second variety are not necessarily dependent upon the size or anatomical situation of the growth, and this is the reason why the signs of pressure are relatively more numerous and more frequent in cases of malignant intra-thoracic tumour. In addition to mere pressure a cancer or a sarcoma has a disintegrating and an irritative action on the tissues in its neighbourhood. In the case of the mediastinum veins are narrowed and their walls incorporated, bronchial tubes are perforated and obstructed, and nervous trunks are not pushed aside, stretched, or pressed upon, but are buried in the substance of the malignant mass. The irritative effects of a growing malignant mass have in the foregoing pages been well illustrated by the pleurisy, pericarditis, and pneumonia which were frequently found to have been set up in the neighbourhood of the tumour.

By bearing such general principles in mind we may often be able to judge of the kind of pressure which is being effected within the chest—whether a simple pressure, or one accompanied by tissue change around the seat of disease. Generally, too, the pressure effects of solid tumours within the chest are more numerous than those, for example, of aneurism. In aneurism we can often demonstrate only one pressure effect—e.g., recurrent nerve pressure—whereas in solid growths we often have a large number—e.g., localised oedema, varicosity, dyspnœa, obstructed bronchi, hoarseness, &c., in one and the same case. In this way it is seen, then, that a careful study of the pathological anatomy of mediastinal tumours aids all our efforts at rational diagnosis, and affords a lucid explanation of the physical conditions made out on examination. After what has already been written it is quite unnecessary to discuss the physical signs and changes caused by the
growth of intra-thoracic solid tumours in detail; but, before leaving the matter of general diagnosis, I should like to refer very briefly to one or two specially useful diagnostic points:—

(1) The development of fulness and nodular or glandular projections beneath the clavicles and in the neck.—Such developments are specially characteristic of the presence of lympho-sarcomatous formations; and in the investigation of all such cases should be carefully sought for. In Cases 1, 2, and 5, distinct evidence of this kind was obtainable; in Case 4 the post-mortem condition would have suggested that, possibly, some fulness might have been made out before death. In Dr. Macintyre's case, referred to at page 36, there was strong evidence in support of the opinion that the tumour had extended up from the mediastinum into the posterior triangle of the neck.

(2) The development of secondary nodules.—This is a condition of great diagnostic importance, and may occur both in case of cancerous and sarcomatous formations within the chest. Thus, in Cases 1 and 2 of lympho-sarcoma, there were nodular swellings over the right angle of the lower jaw and over the scapula respectively, each of which, I have no doubt, was a secondary growth. In Case 2, the liver was found to be studded with secondary nodules presenting the same characters as the primary thoracic growth. In the case of primary mediastinal cancer described at page 116, there were two very typical secondary subcutaneous nodules which I have already commented upon (page 120). Glandular enlargements may also be met with in tubercular formations within the chest (see Dr. Moore's case, page 169), and it is interesting to note that, as in this case, such enlargements may entirely disappear after death, a circumstance not likely to happen to a malignant nodule.

(3) Spasmodic asthma, and paralysis of the vocal cords.—Spasmodic attacks of dyspnœa are very common in cases of glandular enlargement within the chest, and this symptom has been probably sufficiently discussed at pages 35 and 36. I would like, however, again to insist upon the fact of spasmodic asthma—i.e., spasm of the whole bronchi rather than of the vocal cords—as a symptom very specially indicative of the presence of a malignant growth within the chest.

(4) Local oedema and local venous varicosity.—These symptoms need no further elucidation. It is necessary, however, to mention that both may entirely disappear before death, and may not be discoverable at the post-mortem examination. The disappearance of local oedema was well
illustrated in Drs. Moore and Finlayson's case of tubercular mediastinum (see page 169); and I have recently had a case of intra-thoracic lympho-sarcoma, where a well marked varicosity of the superficial subcutaneous veins was present during life, and entirely disappeared after death.

Of the differential diagnosis between mediastinal tumour and pleurisy with effusion, it is unnecessary at present to say more than that, so far as the physical signs are concerned, the resemblance between the two conditions may be exceedingly close—a resemblance which may be enhanced by the fact that both conditions may be present in the same case. This circumstance is well illustrated in Case 2, and it is only by not trusting too implicitly to the physical signs, and by giving every heed to the general principles enunciated above, that we are in some cases enabled to arrive at an accurate diagnosis.

The present state of our pathological and clinical knowledge, however, permits of us going a step further. Not only should we be able to diagnose clinically the presence of a solid tumour within the chest, but we should also be able to arrive at a tolerably clear idea of the kind of solid tumour with which we are dealing. I quite agree with Letulle, who in a clinical lecture delivered in the Hôtel Dieu, and published in *La Semaine Médicale* for 18th September, 1889, stated that he believed it possible nosologically to classify cases of primitive tumour of the mediastinum under observation during life.* Here, again, it is by careful discrimination of the pathology of the affection, and not by a mere investigation of the physical signs, that we must proceed. In the first place, we must get rid of the notion that the majority of mediastinal sarcomatous tumours are related to lymphadenoma or Hodgkin's disease. I have already written at sufficient length upon this matter (see page 415, vol. xxxv). Again, the result of our previous study of mediastinal tumours has been to convince us that by far the largest proportion of primitive mediastinal tumours are lympho-sarcomata, a circumstance not to be forgotten in the determination of the variety of tumour with which we may be dealing.

As regards the differential diagnosis between sarcomatous and cancerous tumours of the mediastinum, there are several points, which have already been illustrated in the accounts of cases, and which may help a good deal in the distinction. As a general rule lympho-sarcomatous growths are large bulky tumours, often giving rise to very definite physical

* *Annual of the Universal Medical Sciences*, 1890, vol. iii, B-14.
signs, and causing multiple pressure effects, which there is usually little difficulty in recognising. Such tumours also very readily grow towards the front of the chest. Primary cancers of the mediastinum, on the other hand, are usually smaller and more limited tumours, and in respect of their individual size or bulk are often incapable of giving rise to physical signs capable of detection. Primary cancerous growths, as has been pointed out, originate almost always in the posterior mediastinum, and as they are specially liable to break down by ulceration, it is possible that evidence of their presence might be obtained by microscopical examination of the sputum. With the exception of malignant stricture of the oesophagus, primary carcinoma of the mediastinum is frequently very difficult of diagnosis, and is probably most likely to be mistaken for phthisis pulmonalis. This was so in the case reported at page 116, and a similar diagnosis was also made in a case of carcinoma of the mediastinum in a young woman aged 27, reported by Lissier in the Bulletin de la Société Anatomique for 20th December, 1889.* It is to be remembered also that even in cancerous strictures of the gullet pressure symptoms may sometimes be met with. In this regard an important paper by Drs. James Finlayson and Joseph Coats may be referred to, in which a case is recorded where a cancerous tumour of the oesophagus caused paralysis of the left vocal cord.† To this paper Dr. John Macintyre contributes an important note, in which he gives a full account of the literature bearing upon laryngeal paralysis as a symptom of oesophageal cancer. It is essential, then, that such a combination should always be borne in mind in every attempt to arrive at a diagnosis of mediastinal cancer. Cancerous tumours within the chest are also prone to metastasis, and the significance of this as a diagnostic feature should also be kept in view. In the case recorded at page 116 there were two secondary metastatic tumours, and in Dr. Finlayson's case just referred to there was a tumour in the body of the twelfth dorsal vertebra, which during life had given rise to an inexplicable pain in the abdomen.

It is quite unnecessary to refer at any length to the differential diagnosis of fibromata and tubercular new-growths of the mediastinum. What has already been written with regard to the possible association of the former with the rheumatic diathesis should help us in arriving at an opinion as to whether we have to deal with a fibrous tissue new-

* Annual of the Universal Medical Sciences, 1891, vol. i, A-51.
growth within the chest; and the association with multiple subcutaneous fibrous nodules should by no means be forgotten. Tuberculosis of the bronchial glands in children is a disease quite within the reach of diagnosis during life; but, as the features which lead us to an accurate opinion have already been sufficiently adverted to, and as they are to be found in detail in all the good text-books on children's diseases, it is unnecessary to allude again to them here. Some difficulty, however, might be experienced in forming an opinion as to the nature of a tubercular tumour like that described at page 169, and under such circumstances the symptoms and signs might readily enough be regarded as pointing to the presence of a lympho-sarcomatous tumour. Under such circumstances I would urge the necessity of giving due weight to the other manifestations which the patient may present of the tubercular disease. Due and judicious importance should be attached to all the signs of the tubercular tendency in dealing with any intra-thoracic tumour, as to whose real nature we are in some doubt.

With regard to the differential diagnosis of the forms of new-growth which may attack the mediastinum, but which are on the whole rare in occurrence as compared with those varieties already discussed, I feel that very little can be said. In the case of the more ordinary varieties of tumour formation being excluded, one cannot do more than attempt to arrive at a correct conclusion by the careful consideration in detail of all the clinical and pathological features of the individual case. Thus, there are well known special features about such affections as hydatid disease and teratomatous tumours, which might be made use of in attempts at differential diagnosis, and it is necessary to do no more than to mention this in order to indicate the lines along which such efforts should proceed. With regard to syphilitic tumours in the chest we have seen that they are most likely to originate in connection with the bony structures of the thorax (page 175), particularly the sternum, and this circumstance, along with a careful search for other syphilitic manifestations, should always be carefully taken into account in considering the question of diagnosis.

The prognosis of mediastinal tumour is almost always very grave, even in the case of those varieties in which a possibility of ultimate recovery might perhaps be looked for. Tubercular, syphilitic, and hydatid disease constitute a series of affections in which recovery may not unreasonably be hoped for; but, when they affect the mediastinum, the proximity to
important structures renders the prognosis exceedingly grave even with regard to them. In the case of malignant disease the outlook is hopeless.

Concerning the treatment of mediastinal tumours there is unfortunately little to be said. As in my previous remarks I have endeavoured to show that all sound diagnosis of these very serious affections must rest upon a clear and practical knowledge of their pathology, so also it is right to make it plain that all rational treatment must be established on a similar foundation. The treatment of malignant disease is always a hopeless thing, and it must be especially hopeless when the seat of the disease is so inaccessible as the interior of the thorax. Modern surgery can sometimes attack, with more or less success, the malignant disease of the abdomen, but I do not think that it has yet affected anything against that of the mediastinum. Medical treatment of these formidable affections has been no more successful, and all that the physician can accomplish is simply to alleviate symptoms and complications as they arise. One of the most disagreeable symptoms met with, in the course of malignant disease of chest, are the suffocative paroxysms which are apt to arise from nerve pressure, particularly in cases where the tumour spreads up into the root of the neck, and involves the pneumogastric trunk, as in those referred to at page 36. The important practical point to remember with regard to tracheotomy is that it can only be expected to give relief if the distress chiefly arises from spasmodic closure of the glottis. Unfortunately, as we have seen, the laryngeal spasm, in many cases, is associated with very decided bronchial spasm as well, and if the latter symptom be at all severe, it will practically undo any good in the way of temporary relief that might otherwise arise from tracheotomy.

In cases where the tumour has caused a large quantity of fluid to be effused either into the pleura or the pericardium, relief may be afforded by the operation of tapping the chest. In a case of secondary cancer within the thorax following the removal of a scirrhus of the mamma, I have seen marked temporary relief from this procedure; and, as has already been pointed out, paracentesis thoracis may often be of service from the point of view of diagnosis, as in cases of mediastinal malignant disease the fluid withdrawn is frequently bloody. Often, however, the fibrinous element may so predominate in the pleural and pericardial exudations in such cases, that the operation of paracentesis is rendered of little service either for diagnosis or treatment.
Local œdema of the upper extremities may possibly be relieved by the very careful and accurate application of a soft flannel bandage from the fingers to the shoulders. Considering the very obvious mechanical cause of the œdema, and the very slight possibility of our being able to remove the cause, attempts to relieve the swelling by punctures or by the use of Southey's trocars should not be made, except as a last resort in cases where there is a risk of the skin giving way. Cough, dyspnœa, restlessness, and pain must be treated on general principles.

In cases of fibrous disease of the mediastinum, like that recorded at page 162, in which it is possible that the mediastinal lesion may be associated with and dependent upon the rheumatic diathesis, a carefully regulated course of anti-rheumatic medicines might at least be tried. Such treatment might possibly have the effect of arresting the course of the connective tissue hyperplasia, if it did nothing more. The fact that subcutaneous rheumatic fibrous nodules do disappear, and sometimes with very remarkable rapidity, is, so far as it goes, encouraging, but against this we must place Dr. Cheadle's opinion that an abundant eruption of such nodules is of very serious and even fatal import, at least in the case of children. It is possible, however, that in the case of adults such an opinion might require modification.

It is quite unnecessary to speak in detail of the general principles involved in the treatment of tubercular affections of the mediastinum, as the same rules must be followed out here as in dealing with the other varieties of tuberculosis. It is essential, however, if one is satisfied of the presence of tubercular glands or of a tubercular tumour within the chest, to pursue the constitutional and hygienic treatment of the case with the most unremitting zeal; for, as has been shown, a tubercular nodule may at any moment ulcerate its way into a bronchus or a blood-vessel with the most disastrous results. That tuberculosis of the mediastinal glands is capable of cure is a fact with which everyone, who has had much experience of post-mortem work, is perfectly familiar. As a general rule, tuberculosis of the bronchial glands is quite removed from local treatment, but occasionally an abscess pointing at the surface of the chest may form and be amenable to surgical treatment. "In other instances," say Ashby and Wright, "the glands may form an abscess which points in one of the intercostal spaces close to the sternum, as in a case under the care of Dr. Eustace Smith, or may open into the œsophagus. In one of our own cases a mediastinal
abscess pointed near the left edge of the sternum, low down."* The possibility of such an occurrence should, of course, be borne in mind.

Syphilitic affections of the mediastinum may be treated with very reasonable hope of cure according to the ordinary rules; and I know of one case of syphilitic disease of the lymphatic glands, presenting many of the classical clinical features of Hodgkin's disease, that completely recovered under a prolonged course of iodide of potassium.

In conclusion, however, it must be admitted that in the majority of cases the treatment of the tumour formations of the mediastinum is very hopeless; and in what has been said, I have simply endeavoured to suggest a few principles which I trust may be of service to the practitioner when called upon to deal with individual cases of this very formidable disease.

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REPORTS OF HOSPITAL PRACTICE.

FROM THE PATHOLOGICAL DEPARTMENT OF THE GLASGOW ROYAL INFIRMARY.

(Under the Direction of John Lindsay Steven, M.D.)

1. Two Cases Illustrating the Pathology of Consecutive Nephritis or Surgical Kidney—[Reported by Mr. James Devon, Student of Medicine, St. Mungo's College.]

Case 1.—Pelvic Cellulitis with Great Matting, and Consecutive Nephritis of Embolic Origin.—G. G., aged 40, laundress, admitted to Ward 28, under Dr. Knox, who supplied the following clinical note:—"Admitted on 27th February, complaining of enlargement of her womb, which her doctor had told her was a fibroid tumour; menstruates regularly every three weeks; for the last nine weeks has had a yellowish discharge; pain in right iliac region. A hard resistant tumour extends upwards 6 inches above the pubis; and in the right iliac region the contents of the tumour seem to be solid. Dr. Knox considered the case to be salpingitis, resulting from

* The Diseases of Children, Medical and Surgical (London, 1889), p. 204. No. 5.
gonorrhea. Difficulty in defaecation and micturition. Temperature irregular all along."

Summary of Post-mortem Examination made on 7th April, 1891.—Pelvic cellulitis with much matting, but very little pus. Large white kidneys with miliary abscesses. Fatty infiltration of the heart.

External Appearances.—A thin and somewhat emaciated body, with extreme pallor of the countenance.

Chest.—The heart is somewhat enlarged and the arch of the aorta seems dilated, but the aortic curtains are quite competent. The external fat is very greatly increased, especially over the surface of the right ventricle. The fat, on section, is seen to encroach very much on the muscular tissue of the ventricular wall. The other structures of the organ present a quite healthy character. The lungs are emphysematous, and the right is considerably adherent over the apex; but otherwise they present nothing remarkable.

Abdomen.—The great omentum is adherent to the anterior margin of the pelvis, i.e., along the inner surface of the symphysis pubis and ileo-pectineal line, by old adhesions. On breaking through these adhesions it becomes apparent that there has been an old standing pelvic peritonitis, leading to great matting of the pelvic organs, so that the different structures cannot with accuracy be differentiated. At one point a loop of small intestine has been firmly glued to the upper surface of the bladder and adjacent parts, in such a fashion that the wonder is there had been no obstruction. What is supposed to be the right ovary has undergone a peculiar change, being partly cystic and partly solid—the solid portion consisting of nodulated material of the consistence of cartilage. The rectum is loaded with faeces. The os uteri is eroded, and gives exit to a tenacious white material, not further examined at present. No pus in the pelvis. The liver shows nothing unusual and weighs 60 ounces. The spleen is quite pulpy and weighs 10 ounces. The kidneys weigh respectively 7 and 8 ounces, and present the typical characters of the large white kidney. The capsule slips easily, leaving a smooth surface. The apices of several pyramids present a caseous appearance, as if about to ulcerate. All through the cortex are scattered numerous minute points of suppuration. The ureters are not dilated.

Examination of the Pelvic Organs by Dr. J. K. Kelly.—The pelvic organs are all matted together into one mass, and on the surface are attached to pieces of small intestine. Of these portions of intestine, one is about 6 inches long, and is so curved as to have both its upper and lower ends close to
each other. Another is about 2 inches long; both pieces are firmly attached over the region of the right ovary. On being laid open the larger piece presents, at its place of firmest attachment, a round smooth-walled perforation, about one quarter of an inch in diameter, leading into small loculi of the peritoneum round the ovary. The smaller piece here also presents a thinning of its wall, as if ulceration were penetrating from its outer surface. The bladder is slightly distended with urine, in which is a thick deposit of tenacious muco-pus. The mucous lining is healthy. The ureters are traced up, and found quite healthy and undilated, though a slight quantity of muco-pus is found in the left. The uterus is completely enveloped in adhesions, and has to be dissected out before it can be distinguished. It is firmly adherent both to the bladder in front and the rectum behind. In Douglas's pouch are several small loculi filled with serum. On opening the uterus along its left border a small quantity of blood is found at the inner os, but the endometrium seems healthy. The fundus grates slightly on section, and at the right angle of the os externum is a small ulceration. The anterior lip is thickened and of a bluish colour. In the cervix are one or two tensely filled Nabothian follicles. The left ovary cannot be dissected out. When an incision is made across its supposed position, it is found to be about the size of a pigeon's egg, and containing one large and several smaller cysts with smooth walls, which seem to be unruptured Graafian follicles. The wall of the ovary surrounding these is about a quarter of an inch thick. The Fallopian tube is indistinguishable. The right ovary is completely changed into a mass of hard tissue, which seems in some places calcareous, in others cartilaginous. Its section somewhat resembles necrosed bone, and this appearance seems to arise from the infiltration of the hard matter having taken place in the walls of ruptured and contracted follicles. The rectum is quite healthy.

Microscopic Examination, 7th July, 1891.—A microscopic examination of the kidneys in this case is made to-day, and it is found that there are many of the signs of chronic nephritis, of a combined tubular and interstitial character. The interstitial tissue is decidedly increased in amount, and the tubular epithelium is very granular, and drops out very easily. Here and there foci of acute inflammatory exudation are observed, these, no doubt, corresponding to the suppurating points observed in the microscopic specimen.

26th July.—Many sections from different parts of the organ have been examined, with the result of confirming the descrip-
tion as to the general morbid changes present in the kidneys, whilst a more detailed information with regard to the suppurating areas is obtainable. Numerous foci of round-celled infiltration are discovered, generally in the cortical portion of the sections, but also in the pyramids. The cortical infiltrations, as a rule, are somewhat pyramidal in shape, and one or two of them present characters which are strongly suggestive of embolic origin—that is to say, around the margins of some of the infiltrated areas distinct engorgement of the blood-vessels in the affected spot is markedly present; and in one, in addition to this, extensive infiltration of red blood corpuscles has taken place, so that we have all the characters of an infarction, with a slight degree of hæmorrhage—a most unusual thing in the kidney. Examination of the ureter revealed nothing abnormal. The completed examination of the case leaves little doubt as to the origin of the suppurating points. They are evidently embolic, and the irritating material has no doubt been derived from the inflammatory products in the pelvis.

CASE II.—Prostatic Abscess, with Consecutive Nephritis of Right Kidney, and Great Dilatation and Inflammation of Right Ureter.—J. M. H., aet. 30, iron-tube worker, Ward 3, under Dr. Gemmell, who supplied the following note:—

"Admitted 6th April, with pain over lower part of abdomen, of thirteen days' duration; inability to walk, of ten days' duration; and inability to micturate, of thirteen days' duration. The pain and inability to micturate came on simultaneously while at work; the abdomen swelled, and then a doctor drew off a large quantity of urine. Since then the urine dribbles away, and has constantly to be drawn off. Previous to this, patient had been drinking heavily. He had venereal disease four years ago, unaccompanied by sore throat or eruption, but since that time his hair has been falling out. He came into the Glasgow Royal Infirmary with bed-sores. He cannot stand or walk. Patellar reflexes gone; no ankle clonus; bowels move involuntarily. Sense of touch in lower limbs is unimpaired. Tenderness over twelfth dorsal and first lumbar vertebrae. Lungs and heart apparently normal. Urine very alkaline; decided trace of albumen and pus."

Summary of Post-mortem Examination, made on 25th May, 1891.—Pelvic cellulitis; abscess of prostate; hypertrophy of bladder; dilatation of ureter; miliary abscesses of kidney; consecutive nephritis.

External Appearances.—The body is that of a man
apparently about 40 years old, fairly well developed, but greatly emaciated.

Thorax.—On opening the thorax the right lung is found to be somewhat adherent from an old pleurisy. The left lung is non-adherent, and both, on section, appear quite healthy. The pericardium contains almost no fluid. The heart is soft, and nearly empty; its valvular structures and muscular tissue appear quite normal.

Abdomen.—The liver is quite normal. The spleen is slightly enlarged, and soft in consistence. The intestine is examined and found quite healthy. The left kidney and ureter present perfectly healthy characters. On cutting into the right kidney it is found to be the seat of multiple miliary abscesses arranged in groups, and presenting the usual characters of abscesses secondary to disease in the lower urinary tract—i.e., minute purulent points are found projecting from the surface of the kidney, and on cutting into the organ they are found to extend through the cortex as pale yellow streaks. The pelvis of this kidney is very characteristically the seat of pyelitis, the whole organ being a very typical example of pyelo-nephritis or surgical kidney. The right ureter is greatly distended, and its mucous surface is injected. It gives exit to an opaque, purulent fluid. The urinary bladder is contracted, and there is great matting and infiltration of the tissues between it and the pelvic wall, so that the pelvic contents are removed with considerable difficulty. On laying open the rectum a circular ulcer, communicating with a sinus, is found in its anterior wall about the level of the prostate gland. The prostatic urethra has sloughy, opaque, yellow walls, and on opening into the bladder through it, a large abscess cavity, which has almost entirely excavated the prostate gland, and which is covered with a layer partly purulent, partly phosphatic, is exposed. A catheter, passed into the rectal sinus, passes through the floor of the abscess. The mucous membrane of the bladder is black, but not eroded. The orifice of the right ureter is narrowed, but easily passes a stream of water. The spinal cord could not be examined.

27th May, 1891.—The bladder and ureters are dissected to-day. The right ureter is carefully traced till it enters the bladder. Its wall is found to be thickened throughout. Its mucous membrane has a swollen and congested appearance, and for about 2 or 3 inches above the opening into the bladder it is very intensely inflamed—brilliant red in colour. A small probe is passed from the right ureter into the bladder without difficulty, and the cellular tissue of the pelvis surrounding the
entrance of the ureter into the bladder has been evidently the seat of very considerable inflammatory infiltration, by contiguity and continuity to the prostatic abscess. At the time of the post-mortem pus was found issuing when the cellular tissue on the right side of the pelvis was cut into. The remains of a small pelvic abscess communicating with that of the prostate is found in the dissection of the specimen. The small lymphatic glands surrounding the ureter are found to be considerably enlarged. About 3 inches below the pelvis of the right kidney the ureter is the seat of a stricture which prevents the passage of a probe, but freely passes fluid as at the time of the post-mortem. On examining this, it is found to be of the nature of a diverticulum, probably congenital, but greatly aggravated by inflammatory thickening.

The left ureter is carefully traced down to the bladder, and laid open. Its mucous membrane all the way down presents quite healthy characters—a circumstance which fully explains the limitation of the miliary suppuration in the kidney to the right side. The left kidney is quite healthy.

4th August, 1891.—A large number of sections from three different portions of the right kidney are carefully examined with the microscope. The renal tissue, where it has not been involved in the suppurative process, presents, on the whole, tolerably healthy characters—with this exception, that the tubular epithelium is slightly swollen and granular, although not sufficiently so to justify a diagnosis of desquamative nephritis. In these parts of the renal tissue, also, the interstitial structure is normal; and the Malpighian tufts appear to be quite healthy. In various parts of the renal structure, but especially in the pyramidal portion, infiltration of leucocytes, corresponding to the miliary abscesses detected with the naked eye, are observed. In some of these all traces of renal structure are quite lost, and the centre of the mass of infiltration has broken down into a cavity. Sections from the pyramidal portion of the kidney show that an intense acute interstitial nephritis has existed near the apices of the pyramids; and there can be little doubt that the renal suppuration in this case has been directly due to irritating material passing into the kidney from the apices of the pyramids. The capsule of the kidney is carefully examined, but no appearances are observed which would indicate that the irritating material had obtained entrance by means of the capsular lymphatics. In some cases the cortical abscesses are of large size, so that the tissue falls asunder on sections being
cut; and, under such circumstances, the cortical abscess is in direct continuity with the pyramid.

Sections of the right ureter show an immense thickening of the mucous membrane, with many and large lymphatic spaces. Round about these spaces the tissue is here and there infiltrated with leucocytes.

On microscopic examination sections of the bladder-wall present a very marked hypertrophy of the muscular coat; and here and there, in the connective tissue surrounding the bundles of hypertrophied fibres, a few collections of leucocytes are observed, evidently indicative of inflammatory action passing outwards through the bladder-wall from its internal surface.

**Remarks by Dr. John Lindsay Steven.**—The record of these two cases, for the careful examination of which I am much indebted to Mr. Devon, is of great interest from its bearing upon the pathology of surgical kidney or consecutive nephritis. In the *Journal* for September, 1884 (vol. xxii, page 162), I published a paper on “The Pathology of Suppurative Inflammation of the Kidney,” in which, at considerable length, I discussed the whole question. In that paper I classified cases of renal suppuration, and showed that there were two paths by which irritating material might reach the kidney, and so set up scattered points of suppuration—the one was by way of the blood-vessels, the other by means of the ureter. When the two cases just related occurred, I thought that they might profitably be recorded in support of the opinion I arrived at, as the result of careful and prolonged histological investigation, some seven years ago. The first of the two, though a pelvic case, did not cause the inflammation by irritative material passing up the ureter; here the infection of the kidney was clearly pyæmic. In the second case, the infective material as clearly reached the kidney by way of the ureter, and spread in upon the renal structure by the apices of the pyramids. The interesting fact, which very strongly supports my view, is that in this case only one ureter was involved, and, as a result, the suppurating foci were only found in one kidney.
Obituary.

JOHN ROSS, M.B., C.M., B.Sc., KING WILLIAM'S TOWN.

Many of our readers will have heard with deep regret of the death of Dr. John Ross, of King William's Town, which took place at sea on 3rd September. It appears that Dr. Ross was on a voyage to Zanzibar, partly on holiday and partly with the view of seeing for himself an outbreak of zymotic disease there. Within a few days after his departure from home he was found lying dead in his cabin, death, according to two medical men who made a post-mortem examination, being due to congestion of the lungs.

John Ross was born in Kaffraria, and belonged to a missionary family. His father is the Rev. Dr. Bryce Ross, well known as an African missionary, and his grandfather was one of the pioneer missionaries in Kaffraria.

His boyhood having been spent at Lovedale, he was then sent to Edinburgh, where he finished his school education, and attended the arts' classes of the University for two or three years. Coming to Glasgow about 1873, he entered the medical classes at the University, graduating in 1877. After a year in the Western Infirmary, as resident assistant, he proceeded to Vienna, where he spent a winter in the study of various specialities. In 1879 he returned to South Africa, and settled in practice at King William's Town. When the Galeka war broke out, however, he went as surgeon with the Cape Mounted Rifles to the field, where he acquired an interest in ambulance work which years afterwards resulted in his organising a medical staff corps. On resuming duty in King William's Town, he devoted much time to the consideration of sanitary questions, and sought to stir up public interest in these matters by a series of papers in the Cape Mercury, afterwards published in book form, and very favourably noticed by the great German authority, Professor von Pettenkofer. In 1888 Dr. Ross came home to spend a year in the study of hygiene. During that year he devoted himself assiduously to work, taking various courses at Cambridge, at the Fayrer Institute in London, and at the University of Edinburgh, where in 1889 he graduated as B.Sc. in sanitary science. On his return to his practice he maintained his interest in all matters of public health, and it was with the desire of increasing his practical acquaintance with epidemic disease that he undertook the journey to Zanzibar.
The Cape newspapers give expression to the wide-spread sorrow which followed on the reception of the news of Dr. Ross's death, and to the high regard in which he was held as a physician, as an adviser in all matters pertaining to the public health, and as a man. That he had made a name for himself as a leading citizen of King William's Town, and that he held a high place in the affections of his fellow-citizens, was evinced by the large number who attended his funeral, representing all classes of the people.

To us who knew John Ross as fellow-student and friend, it is no surprise to learn of the high esteem in which he was held. His great natural ability, his excellent medical training and knowledge, and his singleness of purpose and energy, marked him out as a man sure to occupy a prominent place; while his kindness of heart, his geniality, and his straightforward manliness and honesty endeared him to all who knew him.

CURRENT TOPICS.

UNIVERSITY OF GLASGOW—ELECTION OF ASSESSORS TO THE UNIVERSITY COURT.—There was a large meeting of the General Council on 28th October, for the election of assessors to the University Court. There were four nominations for the two vacancies. The result of voting by show of hands was—Rev. A. R. Macewen, 89; Mr. David Hannay, 88; Rev. J. W. King, 68; Mr. D. C. M'Vail, M.B., 68. A poll was demanded on behalf of the two having the lowest numbers, and voting papers will shortly be issued.

PATHOLOGICAL AND CLINICAL SOCIETY.—The Society will meet in the Faculty Hall, 242 St. Vincent Street, on Monday, the 9th inst., at eight o'clock. Dr. R. S. Thomson and Dr. Dalziel will show a specimen of aneurysm of the innominate artery, treated by Macewen's method. Dr. Joseph Coats will show parts from a case of multiple sarcomata of the bones associated with abscess. Also, specimens of intussusception, perforation of the heart, and rupture of the heart.

GLASGOW SOUTHERN MEDICAL SOCIETY.—At a meeting of this Society, held in Fleming's Hotel on the 8th October, the following gentlemen were elected office-bearers:—President, Dr. Alexander Miller; Vice-President, Dr. David Couper; Treasurer, Dr. John Brown; Secretary, Dr. C. E. Robertson;
Editorial Secretary, Dr. A. S. Tindal; Sealkeeper, Dr. John White; Court Medical, Dr. Erskine (convener), Dra. James Dunlop, Gilmour, Macgilvray, and Hamilton; Governor of Victoria Infirmary, Dr. E. McMillan; Extra Councillor, Dr. J. C. Edmiston.

Royal Infirmary Nurses.—The newspapers of 20th October contained the Report of the Committee of Inquiry regarding the grievances of the nurses, which extended to two and a half columns. As might have been expected from gentlemen whose credit was at stake, it was exculpatory and apologetic. In our opinion, the Report reads too much like a piece of special pleading. There is too little of a frank acknowledgment of the grievances of the nurses, and too much of that self-satisfied excusing of self which is equivalent to accusing. At the same time we must recognise that, while the grievances are not sufficiently acknowledged in words, they are acknowledged, perhaps in the best way, by the undertaking to provide remedies.

The Committee enumerate the various improvements which have been introduced to increase the comfort of the nurses in past years. The meals, they say, are much better than they were formerly, and special buildings have been erected to give the nurses separate bedroom accommodation. The food supply is obtained from various firms of good standing, and no complaints reached them till now. They also state that the resident medical staff and the patients are quite satisfied with their food, though it is cooked in the same kitchen, and obtained from the same sources as that supplied to the nurses. Several of the Committee dined with the nurses and found the food excellent. The nurses, however, state that the meals on these occasions were exceptionally good, and that if they were always as good they would be quite satisfied. The Managers have thus obtained a standard of sufficiency, and it does not look as if the nurses were exorbitant in their demands. The Committee recommend greater variety in the food supplied to the nurses; that the cook should have a skilled assistant in addition to the present kitchen maids; that a refrigerator be obtained to keep the fish supplies in good condition; that the contractor for butcher meat be enjoined to eliminate all unnecessary fat from the meat; that the night nurses should have some additional fresh meat during the night, which could be heated in the ward kitchen; and that the matron should not only see to the providing of greater variety in the bill.
of fare, but that she should also give special attention to the cooking and serving of the food. These are all wise provisions, and if they are carried out in a generous spirit much good will result.

Overtime is the next question discussed. The night nurses complain that they do not get off duty at 10 A.M., as they should, according to the rules, but are detained by the visiting staff for several hours longer; that they are roused from their afternoon sleep once a week to hear a lecture on nursing; and that when they get a day's holiday they are put on duty before they get sufficient sleep. The probationers, again, complain that they do not get off duty at the proper hour—viz., 8.30 P.M.—and that they are liable to be called to special night duty after their ordinary day's work, and are consequently too long on service at a time. The Managers acknowledge that they have been short-handed as regards nurses, and had resolved at the beginning of August to employ eight additional nurses and eleven extra cleaners, and explain any hardships the nurses may have had in this respect by the strain put on the resources of the Infirmary owing to an epidemic of influenza, which disabled many of them. They recommend that all the nurses should have a holiday once a month, by right and not by favour merely; that sufficient nurses be employed to prevent over work, and that the lectures on nursing be given in the evening.

The most important recommendation of all, we think, is the appointment of a "Nurses Committee" of Managers, to whom superintendent, matron, and nurses can have access at all times, and who shall see to the recommendations of the Committee being carried out. With an efficient Committee and a capable matron, we think there should be no vestige of well founded grievances left to the nurses which will not be at once remedied.

We may add that the result of the enquiry has justified the position taken up by the nurses and embodied in the letter to the newspapers which first raised the question publicly. In a public institution, where there are many officials, grievances are sure to occur unless the most careful supervision is exercised. We deprecate most strongly the tone of injured innocence which appeared in a letter by a much respected former manager of the Infirmary, and which is too manifest in the tone of the Committee's report, and we trust that a determined effort will be made to place the Royal Infirmary in every respect in a state of thorough efficiency. We suspect that there has been in the past too much of a
cheese-paring disposition in the management. If more money is needed to make the place efficient, we feel sure that it will be forthcoming. The Royal Infirmary will not be allowed to starve.

Besides the report of the Committee, there is a document issued by the resident physicians and surgeons. These gentlemen have all along sympathised most warmly with the nurses, and from their position they may be regarded as specially informed in the matter. Their paper summarises the grievances of the nurses, and makes a series of suggestions, fifteen in number. Many of these suggestions have been embodied in the report, and we hope that the others will receive careful consideration by the Directors.

UNIVERSITY OF GLASGOW.—The following gentlemen have passed the first professional examination for the degrees of Bachelor of Medicine (M.B.) and Master of Surgery (C.M.):—


The following gentlemen have passed the second professional examination:—

Current Topics.


The following gentlemen have passed the third professional examination:—


B. Not including Pathology.—Peter Aitken, John Anderson, Charles James Babes, John James Boyd, Forbes Brown, George Burnside Buchanan, B.A. (Cantab); James William Moon Buick,
Koch’s Further Communication on Tuberculin.—In the *Deutsche Medicinische Wochenschrift* for 22nd October, 1891, the discoverer of the tubercle bacillus and its products gives an important account of his later researches on the composition of tuberculin. He holds that the accounts of experiments already made by others have been published too early, for the subject is even yet incapable of being completely investigated and settled; and therefore he confines himself to a simple account of his own results, and does not in the meantime compare them with those of other experimenters. In investigating the subject, Koch has pursued his usual careful method, testing each chemical product isolated from the fluid by inoculation of animals. He has found that as healthy guinea-pigs require a large dose to react, they were not suitable, whereas tuberculous guinea-pigs, on account of their ready reaction, were very suitable for his experiments in this investigation. In experimenting upon guinea-pigs, we cannot be content with any dose less than a fatal one, because in them the reactions, both local and general, are trifling to the ordinary doses, which produce so striking results in tubercular men. Details as to the amount of tuberculin necessary to produce fatal results in the different stages of tuberculosis in guinea-pigs follow, which our readers can find in the paper. In every case he makes a control experiment with the ordinary tuberculin, and uses a similar dose of the extracted substance, carefully comparing the results. The mode of death from tuberculin in tuberculous guinea-pigs is so characteristic that it can hardly be mistaken for any other disease; and according to the stage of the tubercular affection, occurs in from six to thirty hours. If the death occurs earlier or later than this it is generally not due to the tuberculin. The *post-mortem* appearances of death from tuberculin are described in detail,
and can be pronounced on with certainty. He considers the haemorrhage-like spots on the surface of the liver as pathognomonic. His first attempts at separation were made by absolute alcohol, on the addition of 5 volumes of which to the tuberculin a brown mass was precipitated, leaving a clear supernatant fluid, both of which showed the tuberculin action in equal degrees. A separation therefore was not possible in this manner. By using a large excess of alcohol, and elaborate filtering and drying processes, he succeeded in obtaining a white powder which, however, was not the active substance in a pure state, but contained a number of insoluble extractives. The amount of this powder was about 10 per cent of the tuberculin used. The remaining alcohol, on being evaporated, left a fluid which had a much weaker action than ordinary tuberculin. With the assistance of Proskauer and Briege he tried ineffectually, by various chemical substances, to separate the active principle from this powder. In the course of experiment he found that alcohol and tuberculin, in the proportion of 2 to 3, gave instead of a brown resinous mass, a white flocculent precipitate, from which he obtained a light grey powder by washing with 60 per cent alcohol. This grey powder reacted in such a way as to convince him that it was almost pure. The pure powder was about 1 per cent of the tuberculin. A long account of the properties of the pure tuberculin is given; and it is stated that glycerine is the best preservative for the active principle. A careful investigation of the chemical composition of the pure tuberculin is given. Drs. Kitatsato, Wassermann, Maas, and P. Guttmann consented to receive injections of the pure substance, with reaction very similar to that observed in healthy individuals with common tuberculin ("rohtuberkulin"). By investigation in the cases of patients in the Moabit Hospital it has been found that the pure tuberculin is forty times stronger than the ordinary variety.

Koch's paper concludes with a full account of the method of preparing tuberculin, and he is not sure that his method is the best that may yet be devised.

The Rudolf Virchow Museum in Berlin.—In the Deutsche Medicinische Wochenschrift, No. 42, 13th October, 1891, Professor Paul Grawitz of Greifswald gives a paper strongly recommending the foundation of a national pathological museum in honour of Professor Virchow.

Grawitz was for eleven years assistant to Professor Virchow in the Pathological Institute of the Charité Hospital in Berlin,
and he tells us in this paper that the Professor has gathered together an enormous collection of preparations illustrative of pathological anatomy, which are crowded in the garrets of the Institute. That these thousands of preparations have all passed through Virchow's hands several times, and that he has entered a description of each of them in a catalogue giving reference to the post-mortem report, so that the diagnosis can be verified at any time, and he has directed personally how each preparation was to be preserved, and this now for more than thirty-five years.

He says that if rooms were obtained for the proper display of these specimens, the Germans would have reason to be as proud of their Rudolf Virchow Museum as the English are of Hunter's Museum in London.

He goes on to point out the great value such a museum would have for medical men, enabling them to further educate themselves in all branches of medicine, and for this purpose he considers it would be of as great or greater value than post-graduate courses. It would also be of great use in enabling men to correct their impressions before bringing forward cases as new, which such a collection might show to have occurred not infrequently in the past.

Before closing his paper, Professor Grawitz recommends a method which has enabled him to preserve the colour of pathological specimens now for five and a half years, and he hopes, therefore, that it will preserve them much longer. The fluid in which he preserves the preparation (after separating portions for microscopic examination) is composed of common salt, 150 grammes; saltpetre, 20 grammes; boracic acid, 10 grammes, in a litre of water. This fluid is as clear as water, and should be changed several times, then 20 grammes of chloroform water is added, and the vessel firmly closed.

Such preparations are of no use for microscopical examination, and therefore portions should be kept in alcohol or bichromate for that purpose. The specimen should be set up at once in the position it is to be kept in, as the preparation of fresh cut surfaces later on is unadvisable; this, however, saves double trouble.—C. W.

DERMATOL.—We have received from Messrs. Burroughs, Wellcome & Co., a specimen of this new preparation. Chemically it is a subgallate of bismuth, and has been investigated by Dr. Glaeser, assistant physician at the University Gynæcological Clinic, Breslau. Dermatol will be seen to have a similar yellow colour to iodoform; it is insoluble in water,
very stable, and quite odourless. Applied to small external wounds, raw surfaces, and in fresh laparotomy wounds, the removal of the dressing showed practically no secretion, and there was nowhere any trace of irritation. The wounds closed up with rapidity. In extensive tissue necrosis and granulating wounds the effect was wonderful. For certain slight skin affections, excoriations, intertrigo, slight moist eczema, dermatol is not used alone, but preferably in combination with an inert powder such as starch; or as an ointment—1 part dermatol, 1 part vaseline, and 8 parts lanoline.

REVIEW.


Most of these lectures have already appeared in print, but there can be no doubt that their publication in book form (in preparation for which they have undergone some alteration and extension) will be welcomed by the many readers who have already learned to appreciate the writings of Dr. Saundby, and especially his admirable Lectures on Bright's Disease.

The first chapter deals mainly with the physiology of glycosuria and its experimental production. Dr. Saundby recognises that physiological experiments on animals have not as yet thrown much light on true diabetes in man, though many interesting facts have in this way been ascertained. He does not seem to us, however, to insist sufficiently on the distinction to be drawn between diabetes and glycosuria, and it is noteworthy that he does not attempt to define the meaning that he attaches to the term diabetes. His exposition of what is known of glycosuria from the physiologist's point of view is brief, and his discussion of the uses of glycogen in the economy and its relations to glucose is rather unsatisfactory; those specially interested, however, will find full reference to the bibliography of the subject.

In relation to experimental glycosuria, he draws attention
to what may prove to be a serious source of fallacy in Fehling’s and Trommer’s tests. It is generally known that some urines which do not contain sugar reduce the copper in these tests. Schmiedeberg and Meyer have shown that in these urines the reducing substance is glycuronic acid, which is found in the urine after the administration of various drugs—e.g., chloral hydrate, camphor, phenacetin, morphia, chloroform, croton chloral, and curare. The application of the fermentation test will exclude this source of fallacy.

The second chapter treats of the etiology of the disease, and is of much greater value. Dr. Saundby has been at great pains to acquire information as to the geographical distribution of diabetes, and though he admits that complete reliance cannot be placed on all the statistics, he has elicited some interesting facts. It seems to be more common in the British Isles (especially in England) than in Prussia or Italy, or in almost any of our colonies and possessions, except Malta, where it is abnormally frequent. Statistics were not obtained from India, but those who could speak from knowledge of that country regarded diabetes as a disease extremely fatal to the higher classes of the population, while it is extremely rare among the manual labourers. The Mongolian and African races seem to have a comparative immunity. It is generally believed that the disease is more common in urban than in rural districts, but from the figures he adduces Dr. Saundby regards this as an erroneous impression. In regard to its prevalence, he believes that the disease is rapidly increasing in this country, the proportion per 10,000 deaths having risen from 19 in 1878 to 30 in 1886. He believes in the heredity of diabetes, although in the majority of cases there is no direct evidence of this. He attaches, as seems to us, undue importance to injury as a cause of diabetes, and the cases he quotes, while no doubt showing that the diabetes was discovered after the injury, do not prove that it occurred because of it. The connection between diabetes and various other diseases is dwelt on, such as nervous affections, exophthalmic goitre, acute rheumatism, gout, influenza, liver disease, diphtheria, enteric fever, pregnancy, &c., in many of which it is no doubt a mere coincidence; but he has omitted to note the comparatively frequent occurrence of glycosuria in diseases of the respiratory organs, especially those of an obstructive kind.

The morbid anatomy of diabetes is dealt with in the Bradshawe Lecture, which forms the third chapter of the book. Dr. Saundby has carefully collected all that has been hitherto described in this relation, and supplemented these
facts by his own observations and comments, but he admits that he has made no great addition to our knowledge. His general conclusion is that the morbid anatomy of the disease is of a very complicated kind, so many lesions having been met with in various organs. We are glad to see that he does not attach much weight to the vacuoles found in the central nervous system, to which Dickinson was inclined to attach a very undue importance. In our experience of the examination of the nervous system, these are of common occurrence, and must in the majority of cases be referred more to the mode of preparation adopted than to real lesions. Dr. Saundby favours the view that the atrophy of the pancreas, so commonly described in post-mortem examinations of diabetics, is the most important lesion, but the bearing of it cannot be clearly understood at present owing to our defective knowledge of that viscus. He also regards as important the changes met with in the abdominal sympathetic ganglia, while he looks upon the changes in the liver, kidneys, lungs, and heart as altogether secondary.

The best part of the chapter on the Clinical History is that dealing with the complications of diabetes, of which a full enumeration is given, with a series of cases illustrative of the more important of them. Here, however, we again feel that in reading this book we are at a disadvantage in respect to the omission of a definition of the term diabetes, for it is clear that Dr. Saundby embraces under it some cases that others would regard merely as glycosuria complicating other affections.

The complication known as Diabetic Coma has a special chapter for itself, to us the most interesting and valuable of these lectures. The subject is fully discussed, and numerous cases are recorded in illustration of the views entertained by Dr. Saundby. We cannot do better than quote his summary of his conclusions:

"1. Diabetic coma is specially apt to supervene in acute cases in young persons.

"2. Diabetic patients and their friends should be warned of the danger of constipation, muscular exertion, nervous excitement, and cold, as probably predisposing causes of death by coma.

"3. The discovery of the ferric chloride reaction in the urine should be taken as a warning against the premonitory symptoms of coma.

"4. Deep respiration, rapid pulse, and abdominal pain are the earliest premonitory signs of this condition."
"5. Cyanosis may be absent in spite of the dyspnœa, and may appear only just before death.

"6. Convulsive seizures are not an uncommon occurrence just before death.

"7. The temperature is usually normal or subnormal, but may be considerably raised.

"8. Diabetic coma, with all its classical symptoms, occurs independently of any excess of fat in the blood, and the pathological value of lipæmia, when present, is yet undetermined.

"9. The toxæmic theory—e.g., poisoning by acetone or some nearly allied substance or substances, affords the best explanation of this remarkable group of symptoms.

"10. Recovery is possible from the prodromal symptoms, and even from some degree of drowsiness, but from actual coma it is at least very rare.

"11. Great benefit may ensue in the early stages from speedy evacuation of the bowels by a brisk purgative. Treatment in the later stages seems always unavailing."

We quite agree with Dr. Saundby in the view that diabetic coma is a toxæmic condition, and it is quite refreshing to find that in these days, when everything is referred to bacteria, he has not sought the source of the mischief in a ptomaine or a leucomaine.

Dr. Saundby deals with the treatment of diabetes in a satisfactory manner. He very properly insists on a knowledge of the natural history of the disease being essential to any proper appreciation of the value of treatment, and in this connection draws marked attention to what is too often overlooked—the different tendencies in diabetes in the comparatively young and in the old. Bearing this distinction in mind, he pins his faith to diet, opium, and alkalies. We quite agree with him in his belief in this line of treatment, but we are surprised to find that he thinks so little of codeia, which we have often found of great service in controlling the amount of urine, and therefore the distressing thirst. He has found skim-milk treatment useless, and in one case apparently harmful. We have a distinct recollection of two cases in which we gave this treatment a very fair trial many years ago, the experiment spreading over several months, in which it proved almost valueless. Of the most recently advocated treatment, that by jambul, he has nothing favourable to say, as it has proved quite inefficacious in his hands. He used a preparation of the bark of eugenia jambolana. In only one case have we tried this remedy, using the powdered fruit
seeds of the plant, which we received from a friend in India. So far, we cannot say that any benefit appeared to be derived from its use, but our friend, we hear, has formed a somewhat favourable opinion of it in his experience among the natives of his district in India, where, contrary to the opinions received by Dr. Saundby, diabetes appears to be by no means uncommon among the poorer classes.

The volume concludes with a chapter on Diabetes Insipidus, in regard to which the author accepts the view commonly adopted that it is due to a neurosis. He has nothing very encouraging to say as to its treatment, but he emphasises the fact that, unless due to some serious and incurable nervous affection, the prognosis is not unfavourable.

In concluding our remarks on these lectures, it is only necessary to add that a good bibliography is attached to each chapter, and that in our opinion our readers can refer to this book with confidence, as representing very satisfactorily the present state of medical knowledge in regard to the subject of which it treats.

The Pulse. By W. H. Broadbent, M.D., F.R.C.P., Senior Physician to, and Lecturer on Clinical Medicine in, the Medical School of St. Mary's Hospital, &c. Illustrated with 59 Sphygmographic Tracings. London: Cassell & Company. 1890.

This volume, one of the clinical manuals being issued by Cassell & Company for students and practitioners, is an expansion of the Croonian Lectures on the Pulse delivered by Dr. Broadbent in 1887, and we may at once say that it is the best book on the pulse which has come under our notice. From the first page to the last it is clearly the work of a man who has thought deeply on the difficult problems of cardiac pathology, and it is equally evident that he is a master of clinical observation.

After a succinct account of the history of our knowledge of the circulation and of the pulse, with an instructive reference to the position of Galen, Dr. Broadbent, in his second chapter, defines the pulse, and discusses its mechanics. In describing the pulse he differs from most authorities, holding that there is no expansion of the artery, but only a change in its shape; and, as an illustration of his meaning, he refers to the pulsation which can be felt by putting the foot on the inelastic leather hose of a fire-engine in action, in which there can be no expansion. We believe that he is probably right in a
sense, but his illustration is rather unfortunate; for, while he believes the finger on the artery plays the part of the foot on the hose—i.e., compresses the vessel—anyone who looks at such a hose lying on ground sees pulsation in it, the weight of the wall causing more or less collapse after the wave of fluid has passed on. This is a small point to direct attention to, but it has some bearing on the future pages, in which the diagrams of sectional areas of arteries are made to perpetuate the idea, and it is a view which does not account for visible pulsation.

In this connection he also disposes of a common misconceptions—that the pulse necessarily indicates an onward move of the blood in the arteries, and even may be regarded as the index of that movement. In fact, as he points out, in cases of peripheral obstruction the heart, acting with increasing energy, may fail to propel even an average amount of blood into the aorta, though it raises the blood pressure. And this consideration is of an importance not generally borne in mind, for he believes "it enters into the explanation of dropsy, and especially of the varying amount of dropsical effusion under apparently similar conditions, and that it also helps to clear up obscurities in the relation between circulatory conditions and head symptoms." Such suggestive remarks as these are met with everywhere throughout the book.

The factors of the pulse, the action of the heart, the elasticity of the great vessels, and the resistance in the arterioles and capillaries, are each considered in relation to their individual and united effect on the mechanism of the pulse, and varieties of pulse dependent on these relations are briefly described. One of these, the pulsus bisferiens, is, according to the tracing given, clearly that generally known to users of the sphygmograph as an "anacrotic" pulse; but the name is not applied to it at p. 26, while the description given of "anacrotic" at p. 140 applies to something quite different.

Following on this are some general remarks on the sphygmograph, which so clearly define the views we have long entertained, that we feel tempted to quote a few of them. "In recent teachings with regard to the circulation and the pulse, the constant reference to the sphygmograph has been an obstacle to the application of the newly obtained knowledge to clinical work, and especially to every-day practice. It is not every student who can thoroughly familiarise himself with this instrument, and acquire the requisite skill for bringing out its indications, and the busy practitioner has still less chance
Reviews.

of doing this. . . . The sphygmograph is rarely necessary for diagnosis, and scarcely ever to be trusted in prognosis; . . . . the personal equation of the observer comes in, and if any special result is expected or wished for, an enthusiastic investigator can obtain it, and may, without the least conscious intention, twist facts in the desired direction. . . . The pretence to measure the exact pressure employed in taking the trace, and thereby to obtain corresponding knowledge of the intra-arterial pressure, is illusory. . . . While, then, I think that every student ought to be familiar with the sphygmograph, and will gain from a study of its indications a comprehension of the pulse in its different forms, obtainable in no other way, I am of opinion that we learn by means of the educated finger all that the sphygmograph can teach, and more.” It has long been our opinion that the introduction of this instrument into our hospital clinics has been a considerable disadvantage, as it has led to the students being taught too little of the digital examination of the pulse; and few, if any of them, acquire that tactus eruditus which is conspicuously at the command of the internes in our fever hospitals.

Dr. Broadbent refers to the various sphygmographs in common use, but we are surprised that he, as well as almost all British writers on the subject, makes no reference to the work of Dr. Alonzo T. Keyt, whose observations on simultaneous tracings of the heart and arteries, with simultaneous time record, seem to us to offer much more valuable information than any to be obtained by the ordinary instruments.

The third chapter is chiefly concerned with the mode of feeling the pulse, of which an admirable clinical description is given. The varieties of pulse are also noted, and correlated to the condition of the heart and of the arteries.

The heart-sounds in relation to the pulse are discussed in Chapter IV, the views which are upheld being mainly those of Sibson, while every page bears evidence that these views have been thoroughly tested by the author’s clinical observation. The chapter is full of interest, and it is worth pointing out that in many ways it shows how good observers may differ even in regard to fact. For instance, while we have been taught that the pulmonic second sound is usually less loud than the aortic—an instruction which we have frequently confirmed by our own observations—Dr. Broadbent gives it as the result of his experience that the pulmonic second sound is louder than the aortic. In matters of theory, also, he is at variance with many writers on the heart—e.g., he regards as
obsolete the view that the second sound is due to the click of the semilunar valves; and he believes reduplication of the first sound to be due to a want of synchronism between the first sounds of the two ventricles, and therefore between the first moments of their contraction. He faces the difficulty presented by reduplication of the first sound, but he does not seem to us to have removed it. In proof of his view, he refers to observations common at St. Mary's Hospital, but hitherto unknown to us—viz., that the asynchronism can often be felt by pressing the fingers, or the ball of the hand, well into the intercostal space, just to the inner side of the apex beat.

The two following chapters are nominally upon increased and diminished frequency of the pulse, but they are more comprehensive than the heading implies. Thus, we find discussed here the influence of respiration on the pulse, Graves' disease, abdominal aortic pulsation, palpitation of the heart, the relation between infrequency of the pulse and epilepsy, coupled heart-beats, &c. In connection with the question of coupled heart-beats, we again find Dr. Broadbent showing an inclination to belief in asynchronism of the ventricles, while he is compelled (almost reluctantly, it would seem,) to admit that it is a demonstrated fact that there is no such occurrence as an alternating action of the two ventricles. The illustrative cases adduced in these chapters are of extreme interest.

Space will not allow of a detailed examination of the remaining chapters dealing with intermittent and irregular pulse, low and high arterial tension, the pulse in acute disease, in valvular disease, in hypertrophy and dilatation, in aneurism, in kidney disease, in intermittent albuminuria, and in affections of the nervous system. Suffice it to say that these subjects are treated of very broadly, the relations of the pulse characters to various concomitant symptoms being fully traced; and sometimes considerable space being given to the consideration of such symptoms—e.g., Cheyne-Stokes' breathing is brought under review, its main varieties described, and its most typical form referred to high arterial tension. In this connection Dr. Broadbent makes some striking statements—for example, that we do not see Cheyne-Stokes' breathing in mitral disease. We cannot trust our memory to either confirm or deny this observation, but we mention it as one of many clinical observations made by Dr. Broadbent, which suggest a careful examination of case records as the proper outcome of a perusal of his book.

There are few books that have passed through our hands
which we can so heartily recommend to our readers. In every chapter they will find something of assistance to them in their daily work. The book is essentially clinical, and Dr. Broadbent has, in the most happy manner, introduced many illustrative cases that are of great interest.

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This book deals with those symptoms generally grouped under the names of concussion and nervous shock, which, while they may be said to be of traumatic origin, bear little proportion to the actual trauma, great or small, in any given case. Mr. Page's name is already associated with careful and discriminating observations on this subject, and it is obvious that he has dealt with the cases coming under his official cognisance in no perfunctory manner, nor has he allowed them to pass from his ken when his official relation to them had come to an end, so that the reader is able to form an idea in most of the cases adduced of what the illness really amounted to for the patient.

That "concussion of the spine" is a misnomer is a statement which finds pretty wide-spread acceptance at the present day; concussion we know, and sprain of the back we know, but we would prefer to speak neither of concussion of the spinal cord nor of the spinal column, for of these the former does not correspond to any group of symptoms analogous to those of concussion of the brain—that is, concussion in the ordinary sense, and the latter can only denote a condition better and less ambiguously described as sprain of the back.

On the other hand, the theory set forth by Mr. Page does not make light of the possibilities of sprain; the application of the term here, as in injuries of other articulated parts, being limited only by actual dislocation or fracture-dislocation in the case of the vertebræ. Upon this is based a prognosis more hopeful, indeed, than was tenable under the theory of concussion, but which is so just in as much as it discriminates more fully as to existing anatomical lesions, and avails itself of this for treatment. Withal, it is not ignored that the structure sprained is one whose integrity is of much greater importance to the general well-being than that of any peripheral part, not merely in its architectural relation to the whole trunk, head, and limbs, but anatomically to the spinal nerves.
So much for the physical injuries and the objective conditions, but this is not all with which we have to deal. There remains the element due to psychical disturbance. In the main, the author follows Mr. Thorburn's tentative classification of the post-traumatic functional neuroses:

"1. Acute effects.
   "(a) General nervous depression—'shock' or 'collapse.'
   "(b) A more localised and defined disturbance of cerebral (cortical) origin—'acute hysteria' or 'hysteric's.'

"2. Chronic after effects.
   "(a) General nervous depression—'neurasthenia.'
   "(b) A more localised and defined disturbance of cerebral (cortical) origin—'chronic hysteria.'"

Much, of course, had been done when the idea of post-traumatic functional neuroses had been arrived at. But the author's analysis of these conditions, their relations to traumatism and environment, has a lucidity which will do much to popularise the views of which he is the exponent, while his discussion of individual cases, carefully observed over long periods, gives interest and value to the work, independent of any modifications or developments which the theory may undergo.


The number of works on the Diseases of Children, issuing from the medical press, shows no signs of diminishing, and the two works to which we now direct the attention of our readers are likely to prove of considerable utility in their respective departments.

Dr. Ballantyne's book contains the record of a large amount of original work, which will be of considerable value to the pediatric physician, and to the young practitioner, who is introducing himself to the study of children's diseases. From the strictly clinical standpoint, the work is comparatively unimportant, because the author, being still a young man, cannot have had that lengthened and varied experience of the diseases of childhood which can only come with age, and which alone justifies authoritative writing on diagnosis, prognosis, and treatment. From the anatomical and physio-
logical points of view, however, the book is likely to prove of
the greatest service, and many of the chapters bear evidence
of careful study and research, in a department which is
specially that appertaining to the younger members of the
profession—the laboratory and the dissecting room. The
accounts given of the frozen sections of infants are of great
interest, adding considerably to our knowledge of infantile
anatomy, and the understanding of the text is greatly facili-
tated by the excellent chrono-lithographs and other illustra-
tions which abound in the work. We think the title of the
book scarcely indicates with sufficient preciseness its contents.
The book strikes us as being not so much an introduction to
the diseases of infancy, as to the anatomy and physiology of
infancy. No doubt the author is specially concerned with
anatomy and physiology in its bearings upon disease, but this
might have been indicated in the title. The occasional para-
graphs on clinical and physical examination strike us as being
somewhat out of place, and are evidently introduced with the
idea of imparting some clinical character to the book. These
paragraphs are commonplace, and the volume would have
been ever so much stronger without them. The anatomical
part of the work is better than the physiological—the former
is in large part original—the latter is to a very great extent
compiled. We recommend the volume to our readers.

The second work is a compilation, and pretends to be
nothing more. The authorities made use of are given at the
beginning of the volume, which is got up something in the
style of a visiting list, and may be conveniently carried in the
pocket. The first part contains an alphabetical statement of
the medicines, and their doses, suitable for the treatment of
infants and children; and the second gives in a similar fashion
the different diseases, with a concise account of the lines of
treatment applicable to each. The busy practitioner will find
in small compass a considerable amount of useful information
suitable for the contingencies of every-day practice.

On Painful Menstruation: The Harveian Lectures, 1890.
By Francis Henry Champneys, M.A., M.D. Oxon., F.R.C.P.
London: H. K. Lewis. 1891.

The subject of Dysmenorrhœa is still a questio vexata, which
Dr. Champneys in these lectures attempts somewhat unsuccess-
fully to settle.
He considers "Spasmodic Dysmenorrhœa" the only kind which is justly entitled to the name, and includes under it Membranous Dysmenorrhœa, to which he devotes one of the three lectures.

Dysmenorrhœa, he thinks, "is essentially a neurosis, and has motor phenomena (colic) and vaso-motor phenomena (scanty or greatly varying flow)." It "is pre-eminently an affection of the immature uterus." The treatment he recommends is accordingly antispasmodic, and the drug he thinks most useful is castoreum. "A hot foot-bath and a good glass of gin and water at bedtime, at the beginning of the pain," he considers also valuable. "Dilatation is the last resort," "at one sitting under anaesthesia, and with full antiseptic precautions, after ascertaining that the genuine dysmenorrhœal pain is evoked by dilatation of the os internum." But "nothing can be promised," as the dilatation may give no relief whatever.

Membranous dysmenorrhœa receives very full consideration, but without any satisfactory result being reached. In its treatment he recommends again castoreum, and feels tempted to scrape the uterus with an irrigating curette flushed with antiseptic solution, preceded by dilatation. But "the treatment of membranous dysmenorrhœa is a most unhappy problem; not even pregnancy going to full time cures it."

It is curious to reflect that menstruation itself, and the morbid phenomena which so frequently accompany it, should still be subjects of so much discussion. Of a truth, the commonest things are the most unknown. Dr. Champneys has done good service in again stating the problem, though we cannot see that he has much advanced the solution.

**Lead Poisoning in its Acute and Chronic Forms: The Goulstonian Lectures.** By Thomas Oliver, M.D. Edinburgh and London: Young J. Pentland. 1891.

These lectures upon a subject of such vital interest to all medical men, and indeed to others also, are well worthy of study, as, although they do not give much positive information that can be called new, they point out fields for further investigation, and they give what has been already known in a fresh setting.

We would specially draw attention to the digestion experiments which our author has made, and which go far to explain
the method by which the lead is dissolved in the alimentary tract and gains access to the circulation.

The course and symptoms of the disease, and also the pathological anatomy, are discussed pretty thoroughly; but, on the other hand, the treatment of cases is not given with sufficient fulness to guide one in combating the malady.

We think the book would have been much more useful and easier studied had it been rearranged for publication instead of the lectures being published just as they were delivered.

As regards the illustrations, they are very well got up, especially the coloured histological drawings; but the sphygmographic tracings are not satisfactory, as no indication of the pressure is given. For the same reason, the whole discussion of the arterial tension is incomplete, as the character of the tracings given by the sphygmograph very much depends on the pressure applied over the artery which is being examined.

The book is very handsomely got up, printed on good stout paper, and illustrated with a number of capital chromolithographs, showing the blue line on the gums and the histological changes which occur in the tissues.

We hope the writer will soon have an opportunity to improve his work in another edition, by giving it a more suitable arrangement for readers.

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*Practical Guide to the Demonstration of Bacteria in Animal Tissues.* By Dr. H. Kühne. Translated by Dr. V. D. Harris. London: Baillière, Tindall & Cox. 1890.

The demonstration of bacteria in the tissues and fluids of the body is now generally recognised as a very practical and important element in diagnosis. To do this satisfactorily, however, requires not only careful attention to the details of the procedure followed in this or that method, but acquaintance with the general principles underlying the staining of tissue cells and bacteria. It is unfortunate that the larger text-books have a tendency to discourage those entering upon this kind of work by multiplicity and refinements of "methods," and by creating the impression, perhaps, that a great sacrifice of time is required. We are, therefore, confident that this little book will be welcomed by student and practitioner alike, since it will be found, as the author states, to furnish an explanation of the technique and a description
of the methods which would enable anybody to perfect himself therein without a great loss of time. Details are given as to the making of sections and cover-glass preparations, and attention is mainly directed to the use of methylene blue. It is shown how this stain may be employed for the more ordinary bacteria, and also variously modified to demonstrate the rarer species. Fuchsine and methyl-violet are preferable for two or three forms, and the method of using them is briefly described. The composition of the staining fluids is given in an appendix; also, a description of several of the best known microtomes, and of the process embedding in celloidin.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

SESSION 1891-92.
MEETING I.—2ND OCTOBER, 1891.

PRESIDENTIAL ADDRESS BY DR. JOSEPH COATS.

The President took as his subject “The Spontaneous Healing of Tuberculosis: Its Frequency and the Mode of its Occurrence.”*

The prevalence of tuberculosis was first dealt with. Its prevalence is not easy to estimate. The Registration returns give an erroneous indication of the deaths from tuberculosis; it was pointed out that, in the case of children many deaths are uncertified and many are referred to whooping-cough, measles, bronchitis, convulsions, &c., which are really due to tuberculosis. These statistics may, to a certain extent, be corrected by the observations in children’s hospitals where a skilled diagnosis, usually verified by post-mortem examination, is made. In most institutions the deaths from tuberculosis amount to a third, and frequently more than a third of the entire deaths. Correcting the Registrar-General’s statistics by these facts, we should have tuberculosis furnishing about 22 per cent of the deaths instead of about 15 per cent. But we have still to consider the recoveries. There are in children

* The address is published in full in the British Medical Journal of 31st October, 1891.
the very frequent scrofulous or, more correctly, tuberculous lymphatic glands; there is lupus and there are diseases of bones, all of which must furnish a large contingent of cases of tuberculosis not fatal to life. But even among the more deadly forms of internal tuberculosis, such as that of the lungs and peritoneum, there is a considerable percentage of recoveries. As the result of the careful scrutiny of post-mortem examinations, the conclusion was reached that about 23 per cent of the persons who die of diseases unconnected with tuberculosis have been at a former period of life affected with some form of internal tuberculosis. If we take only these into account, excluding the cases of healed external tuberculosis, then we get with the former percentage of 22 a proportion of 45 per cent of persons who either die of tuberculosis or show evidence at the time of death of having been affected. Surely if we take into account the cases of external tuberculosis we shall not be far from the truth in saying that about half the persons born into the world are at some period of their lives affected with tuberculosis. In further developing the subject the immediate results of tuberculous infection were considered, and then the influence of constitutional susceptibility on these results. It was pointed out that both in animals and in man the introduction of the tubercular bacilli is followed by a struggle between the bacilli and cells of the tissues. In human beings the struggle between bacilli and cells is a continuous one. In some persons the bacilli are always overcome, in some the contest is doubtful, whilst in others the living cells continually prove the weaker. We have to add to this a fourth class in which, after the disease has been fully established and has already done much damage, there is so far a recovery in that the infection ceases and is removed, leaving Nature to repair the damage so far as it is in its power. It is this last group of cases which falls to be more specially considered.

The processes involved in the healing of tuberculosis were now sketched, and it was pointed out that these processes all involve loss of tissue and subsequent formation of connective tissue, so as to produce a capsule or cicatrix around the part. There may result either an obsolete cavity or a cicatrix generally containing cretaceous matter, the remains of the necrosed tissue.

In illustrating this the various organs were gone over, and illustrative specimens shown. In the lungs we have healed cavities and cicatrices. In the bones we have, after collapse of the bodies of the vertebrae, ankylosis and condensation of the parts. In the peritoneum we have adhesion of surfaces,
with cretaceous matter contained in the adhesions. Sometimes these adhesions form long bands which may strangulate the intestine. In the kidneys the necrosed tissue may be cleared out and a large cavity formed. In the testicles there may be cavities becoming obsolete.

The statistics of healed tuberculosis were based on observations in the post-mortem room of the Western Infirmary. During ten months Dr. Coats carefully noted the cases in which evidences of healed tuberculosis existed in persons who died of other diseases. The numbers of cases are not large, after all imperfectly examined cases and all cases of active tuberculosis have been subtracted, but they are enough to give some indication as to the frequency of healing, and also to illustrate some other points.

Some of the post-mortem examinations were only partial ones, and others were made in the absence of Dr. Coats, and special attention was not directed to this matter; subtracting these, we have 131 cases available in the ten months; of these, 28 were cases of active tuberculosis, and they are to be excluded for the present purpose. Of the remaining 103 there were evidences of healed tuberculosis in 24, or in over 23 per cent.

As to the forms of tuberculosis, 20 out of the 24 were cases of healed tuberculosis of the lungs. Of the remaining 4, 2 were cases of healed tuberculosis of the peritoneum, 1 of the mesenteric glands, and 1 of the bronchial glands.

The ages of the persons who presented evidences of healed tuberculosis was shown on a table alongside the ages of persons who died of active tuberculosis, and of those who died from other causes. It was seen in these tables that the ages at death in the cases of healed tuberculosis approximate somewhat closely to those in the cases of death from other causes, but, if anything, are a little higher. Thus there are only 29° per cent of the former under 40, while there are 34 per cent of the latter. It was noticable that in the cases of active tuberculosis the order is nearly inverted, those under 40 being 64.5, and over 40, 35.5.

The causes of death were embodied in another table, and it was noted that if any weight can be attached to such small figures, then, perhaps, the most noteworthy fact is the frequency of gangrene of the lung in the cases of healed tuberculosis. One can understand that a lung where blood-vessels have been interfered with by the processes of necrosis and subsequent cicatrisation might be less resistant to acute inflammatory disease than a normal lung. It does look
remarkable that a condition so relatively uncommon as gangrene of the lung should occur in 6 cases out of the 24.

In regard to cancer, it will be noted that it occurs in about the same proportion in the cases of healed tuberculosis as in the general cases. This rather contradicts the general impression that cancer and tuberculosis are in some measure incompatible—an impression which, on other grounds, Dr. Coats regarded as erroneous.

Healing in one locality and extension in another was the last subject specifically dealt with. Dr. Coats began by showing a lung in which there was a considerable healed cavity, and at the same time a widely disseminated recent tuberculosis, with no intermediate stage. This was accounted for by the condition in the larynx. It seemed probable that there had been a tuberculosis of the lung more than two years before death, which had healed. Before healing the larynx became affected, and the tuberculosis had lingered on there. After a time, when extensive ulceration had occurred, the infection was carried back to the lung, and produced a fresh extensive outbreak. The opinion was expressed that this is of frequent occurrence, this opinion being based on post-mortem examination in which two widely separate stages of tuberculosis are often visible in the lungs. The importance of paying attention to laryngeal symptoms in cases of even slight pulmonary tuberculosis was emphasised. Other instances of healing occurring at one place while advance was going out at another were shown, in the case of the vertebrae and the urino-genital tract.

At the conclusion of his address the President referred to the question of tuberculosis as an infectious disease—a question which he had brought prominently before the recent Congress of the Sanitary Association of Scotland in Edinburgh. He suggested this as a topic for discussion in this Society during the present session.

Dr. Maclaren had much pleasure in proposing a vote of thanks to Dr. Coats for his address, to which they had all listened with great interest. When he was a student he used to hear often of the healing of tuberculosis from his teacher, Dr. Hughes Bennett, who paid great attention to that aspect of the subject, and in 1845 published a paper "On the Frequent Spontaneous Cure of Pulmonary Consumption and the Indications furnished by Pathology for its Rational Treatment." Dr. Hughes Bennett was pathologist to the Royal Infirmary for some years, and, according to his investigations, from one quarter to one third of the bodies examined showed traces of healed phthisis—puckerings, cicatrices, &c.
Meetings of Societies.

at the apices of the lungs; and he held that cure occurred not only in early and slightly advanced cases, but also frequently in those far advanced. Dr. Maclaren recollected a preparation which Dr. Bennett used to show them, and which is figured in his work (On the Pathology and Treatment of Pulmonary Consumption, Edin., 1859), of a lung which had a cicatrix measuring 3 inches by 1 inch, and where there was still some sound pulmonary tissue, though the greater portion of it was destroyed—not, as in the specimen shown by Dr. Coats, by the formation of a cavity, but by the lung becoming knit together; the other lung from this particular case showed tubercular changes. Death had occurred from delirium tremens at the age of 50; and at the post-mortem Dr. Bennett asked the patient's brother, who was present, if he (the patient) had ever had any disease, and it then transpired that at the age of 22 he was thought to be dying of "decline," but that he had subsequently got a situation as schoolmaster, and continued well till his fatal illness. Dr. Maclaren was sure that everyone present had had cases of advanced phthisis which had recovered, and he felt that it is a great matter to have a hopeful view of phthisis even if well advanced. Since cod-liver oil was introduced in 1841, great advance had been made in the cure of phthisis—by cod-liver oil itself, and by attention to hygienic, climatic, and dietetic treatment—and thus a much larger proportion of cases recovered now than formerly, while the average duration of cases of phthisis (fatal) had increased from 2 to 4 years, as shown by Williams.

Dr. Buchanan, as a surgeon, begged to second the proposal, and quite agreed with Dr. Coats that a meeting or meetings be devoted to the subject named at the close of his address. Dr. Buchanan would go further, and discuss not only the tubercular bacillus, but the earlier stages of tuberculosis or tubercular disease, whatever they may be; and, in anticipation of such a discussion, he would ask the pathologists of the infirmaries to look into a subject, in which he had taken a great interest, but he began to think he might be wrong in his views since the discovery of the tubercle bacillus. He used to believe that in the earliest stage of tubercle there is a change going on in reference to bone specially, as shown in preparations analogous to those shown by Dr. Coats, which comes a little short of what Dr. Coats had brought forward; and possibly in the tissue of the bone there may be evidence of the presence of bacilli long before either necrosis or caseation, most probably these organisms producing an acrid substance which sets up a kind of change different from
that described, but what he (Dr. Buchanan) described as an asthenic inflammation, which softens the tissue of bones. One gets the bone softened from this asthenic inflammation short of necrosis, short of tubercle, and short of suppuration; and he believed a great many of the hunchbacks seen have not gone through these further stages, but have had their bones softened by the early stage of tubercle, the bone being softened short of casation, necrosis, abscess, &c. This change cannot often be seen in the post-mortem room. But if they would do at the infirmaries what he used always to do in the case of an amputation of a tubercular foot—instead of looking into the joints, to saw the part through in four planes, so as to see the condition of the bones. Take the cuboid to be the one most diseased; then the next bone is in a somewhat similar stage, but the next again is merely red—in a state almost of fatty degeneration, so that one can crush it with the fingers—but he believed it to be in this early stage of tuberculosis short of casation. He would suggest, therefore, that some specimens of this nature should be obtained, and from a study of this stage one could see why there should be so many hunchbacks—without history of abscess and these other further changes—simply because they have their backs crushed down by the softening of the bone.

Dr. Coats replied.

* * * The Council of the Society, at the special request of a number of members and with the consent of the President, have arranged for a discussion of the subject of the Presidential address on the healing of tubercular lesions. This discussion will be held on Friday, 6th November.

It has also been arranged that a Discussion on Tuberculosis as an Infectious Disease will be held later in the session.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

SESSION 1891-92.

MEETING I.—12TH OCTOBER, 1891.

I.—CASE OF BILATERAL FACIAL PALSY.

BY DR. ALEX. ROBERTSON.

Dr. Alex. Robertson showed a patient who suffered from palsy of the portio dura successively on the two sides of
the face. The patient was a married woman aged 27. She had twice suffered from acute rheumatism—first at 13, and afterwards at 18 years of age. There was a well marked pre-systolic murmur. In November, 1890, a fortnight after child-birth, she felt twitching on the right side of the face, and next morning that side was paralysed. Power gradually returned, though some of the affected muscles are still weak in their contractions. Three weeks before her admission into the Infirmary on 4th August, she awoke one morning to find that the left side of the face was affected as the right had been, and it has continued so since that time. The usual indications of left facial palsy exist at present, though there has been improvement at some points in the distribution of the nerves. Thus, though she cannot raise the eyebrow, she can corrugate it. Details were submitted showing the presence of the reaction of degeneration on the left side. Taste was entirely in abeyance in the anterior two-thirds of the tongue on the left side. This was tested by sugar, salt, and acid solutions. On the other hand, she instantly recognised the bitter taste of quinine in the posterior part of the tongue and the soft palate of that side.

Dr. Robertson remarked that the defect of taste pointed to a lesion of the portio dura in or distal to the geniculate ganglion. He mentioned a case that had been under his care about a year ago, in which sensory defect on one side of the face was associated with loss of taste on the whole of the same side of the tongue and soft palate. Solution of quinine at the back, or sugar or salt at the fore part of the tongue, gave rise to no sensation. Anatomical details were submitted to show that the fifth nerve might subserve taste on the back as well as on the fore part of the tongue.

Dr. Robertson considered that the lesion of the nerve was of a rheumatic nature, and was not due to embolism.

Dr. Finlayson said that the main interest of the case for them had lapsed with the recovery of the other (the right) side of the face. Such cases of double facial palsy are not very common, particularly cases that can be fairly ascribed to peripheral paralysis from cold or rheumatic tendency. He had not seen many cases of double facial paralysis altogether, and any he had seen had been obviously from central mischief. He thought, with Dr. Robertson, that the present case was not one of brain lesion, the facts mentioned about the sense of taste being against such a theory, and the electrical reactions also being different from those which one gets with cerebral lesions, except when these involve the nuclei.
Dr. Steven had seen the patient in the dispensary before she was admitted to the wards, and he was almost certain he took a clinical history of the case at that time. The opinion he was then inclined to form was that the heart lesion had something to do with the facial palsy. The history she gave was that she had two distinct attacks of a paralytic nature; and, unless he were confusing the case with another, Dr. Steven thought that at one time the arms were affected. At the time of her visit to the dispensary, he had spoken to the students of the coincidence of the heart lesion and the paralytic phenomena. However, as Dr. Robertson had pointed out, as the result of a prolonged study in the wards, it seemed that the lesion was more likely peripheral than central, although it was natural that one should correlate the cardiac and paralytic conditions.

In replying, Dr. Robertson said that, when the case came before him first, he had the same idea as Dr. Steven—that there was a relation between the heart condition and the palsy. On studying the facts more carefully, it appeared that the first attack was preceded by twitchings. Now, if it had been an embolism of some minute vessel connected with the nerve, there would have been a complete paralysis at once and not merely twitching. Of course, the patient was rheumatic, and that is the most common cause of peripheral facial paralysis; so it occurs to one as not an improbable view that she had an attack of rheumatic inflammation of the sheath of the nerve in the middle ear. It is peripheral—first of the one side and then of the other. It would be most improbable that one should have an embolism first of the one side and then of the corresponding part on the other side; but such symmetry is not uncommon in inflammatory conditions—for example, in skin affections.

II.—CASE OF LOCOMOTOR ATAXY TREATED BY SUSPENSION.

By Dr. Eben. Duncan.

The following is the history of the case shown by Dr. Duncan:—

J. D., stationmaster, aged 30, was admitted into the Victoria Infirmary on the 17th August last, complaining of lameness and of shooting pains in his legs.

Nine months before admission he suffered from pains in his joints and swelling of his ankles, which confined him to bed for five weeks. He had a recurrence of these symptoms two months later, and was confined to bed for a fortnight. He
recovered and resumed work, but for some weeks before admission he had a difficulty in walking and a dimness of vision. About a month before admission the pains assumed a lightning character, and he began to notice a loss of sensation in the legs and feet; he had prickling sensations in the soles of his feet, and felt as if he were walking on carpet.

On examination of his joints no swelling or tenderness could be found, and they were all freely movable and free from pains. His temperature was 99° F. In walking he had an ataxic gait. When placed with his feet close together and his eyes shut he could not stand, and he could not turn suddenly without falling. He could not walk on a straight line. His plantar reflexes were somewhat exaggerated. The other superficial reflexes were normal. The knee-jerk could not be elicited. Sensation was much weakened below the knee in both legs and feet, and perception of pain was much delayed. He could not localise the points pricked with a pin on the foot and ankle, although he felt the pricks. His right pupil was slightly larger than his left pupil, but both responded to light and also to accommodation. Although a married man, he had had no sexual desires for some weeks before his admission. There was no evidence of syphilis, and he denied ever having had any venereal disease. He was, however, addicted to drink. There was no tendency to drop-foot or drop-wrist, and there was no obvious weakening of the anterior tibial group of muscles. His urine was acid; sp. gr. 1020; deposited uric acid, but contained no albumen.

21st August.—Patient, who weighs 10 st. 2 lbs., was suspended by the head on Sayre's suspension apparatus for thirty seconds. Next day it was noted that patient walked better, and that the sensibility of the feet and legs was slightly improved. He was afterwards suspended once a day by the head alone, no axillary straps or elbow rests being used.

1st September.—It was noted that patient had been regularly suspended since last note, and can now remain suspended, principally by the head, for two minutes. Defective sensation is now chiefly confined to the middle third of the right leg, and sensation of the left leg is not appreciably diminished. There is no evidence of the Argyll-Robertson pupil. The knee-jerks are still absent.

7th September.—Suspension is still being carried on daily. He is now being suspended by the head for three minutes. He feels better. The pains in his legs are not so severe; he also walks more steadily. He can stand with his eyes shut, and can turn without falling. The knee-jerks are still quite
absent. Sensation in the limbs is improved, but perception of pain is delayed and very acute.

14th September.—He can now stand suspension for five minutes without any inconvenience. Owing to sleeplessness at night 20 grains of antipyrin to be given at bedtime.

The treatment by suspension was continued until 30th September, when he left the Hospital very much improved. He could walk quite steadily. Sensation in his legs and feet was quite normal, and the only evidences of his disease were slight inequality of the pupils and absence of the knee-jerk in both knees.

12th October.—A fortnight has now elapsed since he left the Hospital, and on examining him to-day I find that the improvement continues. His pupils are now equal, but somewhat dilated; his eyesight has improved. He walks quite steadily and can stand with his eyes shut, and turn without any difficulty. The pains in his legs are gone. Sensibility is normal; and he informs me that his sexual desires have returned. The knee-jerk is still absent in both knees.

Dr. Robertson asked if there were any evidence of syphilis.

Dr. Duncan.—None. He also stated, further, in reply to a question from Dr. Middleton as to any further treatment, that a few doses of antipyrin had been given, in the evenings, for sleeplessness and for the pains in the legs.

Dr. Finlayson said that there were one or two points which led to its being doubtful if the case were a bona fide one of locomotor ataxy. One of these is the state of the eyes, not only the pupillary reflex being present with light, but also this dilatation of the pupils. He thought the usual experience was that the pupils were contracted. The exaggeration of the plantar reflex also seemed an unusual feature in the case of ataxy. With regard to the question whether the patient could have improved so quickly without suspension, one sometimes saw symptoms of a marked and acute character in such cases subside very quickly. In the present case one would have to consider whether alcoholic paralysis would not account for the condition, and the abstinence from alcohol in the Victoria Infirmary might have something to do with the improvement.

Dr. Newman asked what was the idea in the treatment by suspension.

Dr. Duncan replied that it stretches the spine and the spinal nerves, and also improves their nutrition by sending more blood to those parts. With regard to the possibility of alcoholic paralysis, that had been a question in his mind, and
he had not been able to see that that would account for the marked ataxic symptoms in the case. It is quite true that the pupils are often contracted in ataxy, but that is not a constant fact, and many cases are recorded by Charcot, Duchenne, &c., in which dilatation was present. With regard to the plantar reflex being exaggerated, he thought there was no rule that the superficial reflexes in the early stages should be in abeyance, but rather the other way, the pathological condition in the spinal cord not affecting the superficial reflexes.

Dr. Robertson had the same feeling as Dr. Finlayson as regards the diagnosis, although one did see cases of locomotor ataxy in which the Argyll-Robertson pupil was absent. There could be no doubt, in any case, that the patient derived benefit from the suspension, and to him that was instructive, as he had had two cases in which suspension was tried, and neither got any benefit from it, and he had not tried it since; one of his cases was decidedly the worse for it. As a method of treatment it seems a little hap-hazard, but might be tried as a dernier ressort.

III.—CASE OF HYPER-PYREXIA IN ACUTE RHEUMATISM—TREATMENT BY COLD BATH, ETC.—RECOVERY.

By Dr. Alex. Robertson.

Dr. Robertson also showed a patient who had suffered from the hyper-pyrexia of acute rheumatism. He was a labourer, age 29, and a fairly healthy man before this illness. The rheumatism was of a week's standing before admission into Infirmary on 9th September. All the larger joints had been affected, but only the elbows and those of the fingers were painful and swollen on admission. The first sound of the heart was accentuated at the apex. The urine was acid; sp. gr., 1026, with a trace of albumen. Axillary temperature, 100·2°; moderate acid perspiration. He was prescribed 20 grs. of salicylate of soda every three hours, and continued this treatment till the morning of the 11th, when, at the visit (11 o'clock), it was found that the temperature, which had been 100·8° at 8 P.M. on the 10th, had risen to 102° at 4 A.M. and 102·6° at 8 A.M. on the 11th. At the same time the patient said that he was quite free from pain everywhere, and wanted to get out of bed. He had then an excited, anxious aspect. The perspiration was free, but not excessive. Ten grs. of quinine were then ordered, and to be repeated in an hour. Directions were also given that, if after the quinine
the temperature should still increase, as was feared, 2½ grs. of antifebrin were to be given every hour, watching the effects, and giving a little brandy if the heart's action should become weak. It was further directed that, in the event of the fever advancing to beyond 104°, the cold bath was to be used. None of the antifebrin was given, as the nurse noted that the temperature at 2 P.M. had reached 106·8° in the axilla, and the patient had become more excitable and somewhat delirious. She immediately called Dr. M'Gregor, the house physician, who proceeded at once to use the bath. The temperature of the water at the outset was, as ordered, 90°, and it was intended to reduce it to 60° in a few minutes. However, some difficulty was found in adding the cold water, so that it was only lowered to 71°. The patient was kept in the water for twenty-five minutes. Then the thermometer, which had been all the time under the tongue, showed a fall to 101·4°, but the pulse was perceptibly weaker. After being five minutes in bed, the temperature had further fallen to 97·2°. Small quantities of brandy were administered. The pulse fell from 160 to 120 while patient was in the bath. Dr. M'Gregor continued the salicylate of soda as before—namely, 20 grs. every three hours, and patient had four doses between the time of the bath and 11 A.M. of the 12th. The temperature, taken every half-hour, had risen two and a half hours after bath to 101·2°, and four and a half hours afterwards to 101·6°. At midnight it had declined to 101°. Thereafter, hourly observations showed a range from 100·2° to 100·8°. This was its point at the visit on the 12th. At that time the pulse was 100, full, soft, and compressible; the urine was clear, straw-coloured, with no sediment, and only a trace of albumen. It was distinctly acid, and its sp. gr., 1011. Examination of the heart revealed a roughness and abruptness of the first sound, suggestive of mitral obstructive disease, though there was no murmur. The patient was ordered 10 gr. of quinine every second hour, and afterwards every six hours.

After this, except in one point, the patient's progress was very satisfactory. The temperature slowly fell, till on the 14th it had become normal, and it has continued so. There has been no recurrence of pain or swelling of joints. The only drawback is the condition of the heart. There is a short but clear pre-systolic murmur at the apex, accompanied by a thrill.

Dr. Robertson remarked that the entire subsidence of the joint-affection, with the absolute freedom from pain when the mere disposition to hyper-pyrexia arose, was very
striking. The state of the urine was remarkable. Instead of the heavy brick-dust looking deposit of urates so common in acute rheumatism, there was a clear straw-coloured excretion of rather low specific gravity. There had occurred a sudden check in the elimination, and probably also in the formation of those waste products which are so freely excreted in most cases of this disease. Generally there is no cardiac complication in such cases of hyper-pyrexia. But it was not so in his patient, as organic disease developed and continues. It is worthy of note also that it became manifest under the use of the salicylate of soda. With respect to the treatment, antifebrin was ordered, but not given. About a year since, in a similar case, except that the fever-producing tendency of the system was not nearly so marked, antifebrin was administered in hourly doses, and the temperature fell from nearly 105° to about 100°. He did not think it would have succeeded in this case. The very rapid and great increase showed such a disposition to fever as would not likely have been checked by any agent of that kind—unless, perhaps, under the use of doses that would have been dangerously depressing. The fall of temperature from 101·4° to 97·2° within five minutes after removal from the bath is a point of much practical importance.

Dr. Finlayson spoke of his experience of cases of high temperature in rheumatism. He thought, so far as his memory served him, that all his cases had been in private practice. In the treatment of a case of advancing temperature, the mind naturally reverts to the use of the cold bath; but in private practice, or even in hospital practice, unless special arrangements are made for it, the use of a bath is extremely inconvenient, and indeed in all the cases he had seen, impossible. For example, in some houses there is no bath, or perhaps, if there is one, there is a stair up or down which it is difficult to carry the patient—particularly if he be heavy. Under these circumstances he had resorted to using what might be called ice-packs, packing the patient with lumps of ice, down the trunk, and re-applying it if it became too warm. In this way one can carry out the application of cold with the patient in bed.

In two cases, treated thus, the patient’s life was saved—in one the temperature had risen to 107·5°, and the patient was already comatose; in the other case the temperature was not quite so high, but was advancing, as Dr. Robertson had described, every time it was taken, and was up to 106°. In that case also the life was saved. Both of these cases were, he would say, pretty satisfactory. One of them recovered
quite; as regards the other, he was not so sure whether recovery was absolute or whether some partial weakness in the legs remained—that was the case with the temperature of 107° 5'.

Other cases he had had where the treatment was successful in a sense—in the sense of reducing the temperature, but not in saving the life of the patient. One such case was that of a young woman with rheumatism, to whom he was called about 1 A.M. or 2 A.M., to assist in the treatment. They sent and got ice with some difficulty, and Dr. Turner and Dr. Finlayson waited with her all night. Her temperature was 109°, but after vigorous application of cold it was reduced to about 102°, and they thought that they would succeed in saving her life. She never properly regained consciousness; but, from being perfectly insensible, she began to show signs of distress. Dr. Finlayson left in the morning with the pretty confident hope that she would come out of the insensible state, and would recover, but soon after she turned worse again, and died about 9 or 10 A.M.

Another case that he had seen could be spoken to by Dr. R. M. Buchanan with more precision; to it he had been called with Dr. Perry. The temperature was very alarmingly high, and there were comatose symptoms. They got the temperature reduced, and the patient did not die for two or three days, but he did die.

Dr. Finlayson thought that the point he began with is one worthy of consideration. In the case, for example, of the girl he attended with Dr. Turner, it was in a house where there was no such thing as a bath. In the other cases, he thought there was a bath, but it would have been absolute madness to carry such heavy patients (as they were) down or up staircases.

In hospital practice, particularly in some hospitals that lay themselves out for this treatment, they have baths that can be brought to the bedside; elaborate, but so far simple and efficient, arrangements are made for raising the patient by pulleys. For example, in the Middlesex Hospital he had seen such an arrangement, by means of which it can be done with the greatest case by one nurse, who, with one hand, can raise the patient from the bed, and let him down into the bath. If such plans are to be carried out frequently, the apparatus is well worth the trouble and expense.

Dr. R. M. Buchanan said that Dr. Finlayson had already mentioned the chief points in their case. The patient, when he (Dr. Buchanan) was called, was comatose; the temperature in the mouth was 108°, as taken by two separate thermometers.
It was inconvenient to carry the patient in his condition down an awkward staircase to a bath, so he thought he would attain the same result by the application of cold, and at once began with cloths wrung out of cold water until ice could be obtained. Under the use of the ice the temperature fell from 108° to 102° in the course of two hours. The patient never fully recovered consciousness; there were frequent attacks of convulsions, and evidence towards the end of meningitis. The temperature had the tendency always to return to 104°, or even above that; but it was tried, so far as possible, to keep it at least from rising higher than 102°. After the application of ice had been discontinued the temperature continued to fall, reaching a point almost as low as that reached in Dr. Robertson's case, after his patient was removed from the bath. The only other point to be mentioned is the difficulty of feeding on account of the comatose condition. The patient lived for three days after the high temperature. There was no cardiac lesion.

Dr. Robertson, in reply, said that the main point referred to by Dr. Finlayson was the inconvenience of getting a bath; but he thought that this had been exaggerated, and that even though there might not be a bath in the house, one could now be hired. If one can reduce the temperature, he presumed it did not matter very much how that was done; but he thought it not so convenient to apply ice around the patient's body as to put him into a bath. With regard to hospitals, they had, even in parochial hospitals, baths for going to the bedside, and in wards there was always a bath available to which the patient could be carried on his sheet. He thought that with ice one could not reduce the temperature so quickly. "Two hours" had been mentioned, and that was a long time for a patient in such a condition. In the case published some time ago by Dr. Fox the temperature was 110°, and the patient recovered after the use of the cold bath.

Dr. Duncan referred to the ease with which a bath could be hired, and mentioned some cases where this had actually been done.

Dr. Finlayson—At what time can it be obtained? At two in the morning?

Dr. Duncan could not answer for that. He had seen a patient recover after the temperature had been 108° without any treatment of the kind under discussion; so that it does not follow that, though a patient with a temperature of 107° recovered after the cold bath, the bath was the cause of the recovery.
Dr. Beatson had had only one case of hyper-pyrexia in rheumatic fever under his care. The patient (a lady) had passed through an attack of articular rheumatism, and was so far convalescent that the nurse had left. The lady got up in the night, owing to the servant being ill, to prepare a poultice for her. Some slight return of the rheumatism took place, and after it had lasted for two days she became much worse, and the temperature rose again, and at a visit paid early in the forenoon he had found that the temperature was 102°. Calling back about mid-day he learned from her that she was “all right,” and that the pains had ceased, and she moved her legs to show how freely she could do so; but, as she appeared flushed and excited, he took the temperature again. It was then 105°, so he sent for her husband to come to call upon him, and ordered that the nurse should be sent for. The husband came at two o’clock to say that his wife was much worse; and on Dr. Beatson calling he found the temperature then to be 110° (2:45 P.M.), and coma and convulsions to have set in. He had preparations made for a cold pack, but before it could be given the patient died. The noteworthy facts in the case Dr. Beatson considered to be—the rapidity of the rise of temperature; its occurrence in such a short time in what might be called a relapse, the first attack having passed without hyperpyrexia; and the complete cessation of pain.

Dr. Robertson urged that when one saw the temperature rising in such a case, the temperature should be taken every half-hour.

IV.—LARYNX AND TRACHEA FROM A CASE OF DIPHTHERIA.

By Dr. Shearar, Paisley.

Dr. Shearar showed, as a fresh specimen, a larynx and trachea obtained on 5th inst. in Paisley Infirmary. The patient had been admitted on the 2nd inst. with diphtheria. The illness was then of a week’s standing, the croupy symptoms having been present for four days, and growing more marked. It was at 9 P.M. he was admitted, and at 11 P.M. the house-surgeon performed tracheotomy on account of the great dyspnoea. A very striking result of the operation was that there was not so much relief as was expected, although the tube went in all right and was clear. Next day Dr. Shearar found the case quite apparently about to die. There was nothing to be seen in the pharynx; the tube was still free from any obstruction, though the dyspnoea was extreme. Death took place 27 hours after the operation.
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The *post-mortem* took place upon the following day, and then it was found that from the epiglottis downwards there extended a thick layer of false membrane, the mucous membrane being thickened and inflamed, and the diphtheritic membrane closely adherent to it. This membrane was continued downwards to the minute bronchioles, and thus there was a very evident cause of the want of relief after tracheotomy.

V.—CASE OF TUBERCULOSIS OF THE FALLOPIAN TUBES COMPLICATED WITH TUBERCULAR PERITONITIS AND MENINGITIS, AND PRESENTING DURING LIFE SIGNS REGARDED AS THOSE OF POST-Puerperal Mania.

By John Lindsay Steven, M.D.

The case, the pelvic organs of which I now submit for your inspection, was one of very great interest, both from a clinical and a pathological point of view. It is specially interesting in that a distinct physical lesion was discovered to account for the maniacal symptoms which the patient developed before her death; and from the pathological point of view, it is noteworthy because the *post-mortem* has shown that the tubercular infection of the system took place, in all probability, from the generative organs.

The patient was a housewife, aged 32, who was treated in Ward 8 of the Glasgow Royal Infirmary, during the absence of Dr. Wallace Anderson, so that I am obliged to Dr. W. K. Hunter for the following synopsis of the clinical history:—The patient was confined about two months before her admission to the ward, and had made a good recovery, although she had never become very strong. About three weeks after the birth of the child she wakened one morning with a severe pain in the back of the head; she also felt very giddy, cold, and shivery. A little later she found that she had completely lost the power of the left side of the body. This soon passed off, but returned again almost every day for about an hour. As time went on, the patient became quite insane; and no intelligible answer could be obtained to any question. She moaned a great deal, and constantly complained of pain at the back of the head. The temperature ranged about 100° F.; the heart and lungs presented normal characters; but the urine contained a large amount of albumen.

Upon the 2nd October, 1891, I performed a *post-mortem* examination of the body, and the following is an account of its essential features:—
External appearances.—The left hand had a peculiar appearance, as if there had been some spasmodic contraction of the fingers during life. The body was well nourished, and apparently about 30 years of age. The mammas were flaccid; rigor mortis moderately firm; pupils dilated and equal. A sanguinolent fluid escaped in considerable quantity from the vulva; and the subcutaneous and subperitoneal adipose tissue was abundant in amount. On opening the abdomen the peritoneal cavity was found to be considerably obliterated by tolerably recent adhesions, which, however, could be easily separated so as to expose the cavity. On separating the adhesions, distinct miliary nodules were discovered on all parts of the peritoneal surface, the nodules having the characters of tubercles. On the under surface of the diaphragm the arrangement of the tubercular infiltration was quite suggestive of lymphatic injection. There was no fibrin in the peritoneal cavity, the adhesions having resulted from a recent plastic inflammatory change which had not led to any great exudation. The nodules were most abundant near the pelvis, and especially in Douglas’ pouch. The great omentum, which was spread out over the surface of the intestine and adherent both to the loops of bowel and the anterior abdominal wall, was glued by its inferior margin to the anterior half of the ileo-pectineal line. It would seem to have been by way of the great omentum chiefly that the infection had spread from the pelvis to the upper regions of the abdominal cavity. The urinary bladder was distended, and its mucous membrane infiltrated with blood. The uterus was distinctly enlarged, and both Fallopian tubes were distended, particularly the left, which had a slightly sausage-shaped appearance. The distended tubes were filled with a creamy or caseous material, and the os uteri was eroded and red. Apart from the peritoneal changes, the liver, spleen, and kidneys presented nothing very remarkable.

Chest.—The pericardium was generally adherent by adhesions similar to those of the abdomen, the inflammatory action having obviously spread through the diaphragm, although no tubercles could be discovered with the naked eye. The lungs were practically healthy, although here and there a yellow miliary nodule was seen.

Head.—On removing the brain a most extensive yellow exudation was found over the whole basal surface, entirely obscuring the quadrate space, and sealing together the surface of the fissures of Sylvius. On the convexity of the brain one or two opaque yellow caseous nodules, the size of barley corns,
were seen in the soft membranes with surrounding areas of opacity. The lateral ventricles were much distended, and contained a large quantity of slightly opaque cerebro-spinal fluid. On dissecting off the cerebral membranes from the base and in the fissure of Sylvius, and subjecting the vessels to microscopic examination, here and there little miliary tubercles were seen in the walls of the arteries. The cerebral tissue was somewhat softened.

Dr. Workman kindly made several preparations of the cheesy matter from the Fallopian tube for the detection of the tubercle bacillus, but has not yet succeeded in discovering it. But the naked eye characters of the case, along with the microscopic examination of the cerebral membranes, leave no doubt as to its tubercular nature.

On two previous occasions I have published communications on Tuberculosis of the Fallopian Tubes—viz., in the Glasgow Medical Journal, series v, vol. xvii, pp. 411, 462, and vol. xix, p. 1. The first of these two cases is also referred to in Coats' Manual of Pathology. In my paper on the second case I came to the conclusion that tuberculosis of the uterus and Fallopian tubes might be of two kinds—(1) primary if the disease had originated in the generative organs and extended therefrom, and (2) secondary if the Fallopian tube had become infected from the absorption of tubercular matter from a primarily diseased peritoneal cavity. The second of these two cases was in very many respects quite similar to that which I have now brought under the notice of the Society, and was obviously one in which the tubercular condition of the generative organs was primary. In the present case also I believe that the tuberculosis was primary in the uterus and Fallopian tubes. We have no disease elsewhere that could be regarded as of older standing or primary to that within the pelvis. In both of these cases of primary tuberculosis of the Fallopian tubes it is of interest to note that tubercular meningitis supervened in the course of the disease.

Dr. Robertson wished to take exception to the remark naming the case one of puerperal mania.

Dr. Steven—I am only giving the diagnosis of the physician. Dr. Robertson demurred to the case being described as such. There were motor symptoms which should have prevented such a diagnosis. However delirious a patient may be, one does not call the case one of mania if there are objective symptoms; it is merely acute delirium occurring in the course of meningitis.

Dr. Finlayson said that when he saw the billet he at once
thought of a remarkable case he had lately, of a woman, admitted to his ward. In her case they had the history of her being in the Western Infirmary in 1886, suffering from "perimetrritis and parametritis"; and she had recovered pretty well from that to the extent of having been since twice confined. She was just nursing her last child (of about 14 months old) when admitted, for there was then still milk in her breasts. She came in complaining of pains in the abdomen, and her belly was swollen. With the old history one thought of peritonitis. By and bye we had the pelvis examined, and an old cicatrix on the left side of the vagina was found; the cervix was fixed; the os patulous; but there was no local tenderness. There was thus no acute disease there to account for her acute illness. She had also some hemorrhoids. Severe diarrhoea set in in a day or so, and Dr. Finlayson began to think they had a case of typhoid fever. There were high temperatures, distended abdomen, and some slight indication of delirium from the feverishness. In addition to all that, pleural effusion of the right side was evidenced—not extreme, but quite marked. In these circumstances they were somewhat surprised when the temperature rose to 106°8, and she had a rigor; in point of fact she had four rigors.

She was admitted on 27th August, and on 9th September she died.

On the 6th September she became stupid—almost comatose; she could not recognise them, and could not speak to them. By and bye she got out of that condition and could answer quite well, and then she had another relapse of comatose symptoms. In the intervals of coma there was some excitement, and conjugate deviation of the eyes was noted, though Dr. Finlayson did not himself have an opportunity of observing it. When she died he had no fixed idea of the cause. On the one hand they had the old pelvic inflammatory condition; there was the suggestion of typhoid fever; the rigors suggested pyaemia; the brain symptoms seemed to point to local mischief there.

At the post-mortem they found suppuration in both Fallopian tubes, and there were several abscesses in the pelvic and abdominal cavities; there was an abscess between the right kidney and the liver, and another between the liver and the diaphragm; there was also the pleural effusion. No evidence of enteric fever was present. On examining the chest further, the heart was found to present changes in the valves—there being thickening of, and large vegetations on, the aortic and mitral curtains. When she was taking those extraordinary
symptoms he had thought of ulcerative endocarditis, and
listened to the heart; the heart's sounds were rapid and
flapping, but he could not make out any more. On testing
the aortic valve post-mortem it was found competent.

On examining the surface of the brain there was found
purulent exudation, chiefly of the convexity—evidently not
tubercular. Dr. R. M. Buchanan examined the vessels, and
found reason to suppose that this meningitis might be con-
ected with the ulcerative endocarditis.

Clearly the case is one of pyæmia spreading from the pelvic
organs. Dr. Finlayson had been surprised to find that she
had had three children—one before the attack in 1886; the
second three years ago, that is after it; and the last fourteen
months before death.

Dr. Coats supposed that Dr. Steven would probably admit
that the tuberculosis of the Fallopian tubes in his case might
be secondary to that of the peritoneum. The fact of its being
of the distal parts of the tubes to his mind indicated this, and
one must remember that unless there is serious disorganisation
of the Fallopian tubes there is not likely to be an escape from
them into the peritoneum. The play of the cilia, too, is
towards the uterus.

Dr. Kelly had been much impressed by Dr. Finlayson's case,
which was one, evidently not of tuberculosis, but of pyo-
salpinx. Such cases are much neglected, under the name of
"Perimetritis," and the course Dr. Finlayson described is
the usual course of such a case left to itself. With regard
to puerperal mania (although the symptoms of Dr. Steven's
case were not those of puerperal mania), it is generally believed
now that with that form of mania we have usually some
inflammatory pelvic condition. The two former cases of Dr.
Steven's he had read long ago, and the fact of the involve-
ment of the uterus in two of the cases—in the present case
and in one of the two former—indicated that the uterus was
the organ first affected, and the salpingitis secondary to the
uterine condition.

Dr. Steven, in reply, had only briefly to say that, with
regard to the diagnosis of puerperal mania, it was not his; but
the symptoms must have been strikingly like those of insanity
following labour, or occurring during lactation. In reading
the summary of the clinical history furnished to him, the
presence of motor symptoms struck him as significant, but he
did not know that any of these had been observed during
residence in the hospital. He was much struck with what
Dr. Kelly had said with regard to the association of puerperal
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mania and pelvic inflammatory conditions. He could not agree with the remarks of Dr. Coats as regards the likelihood of the affection of the Fallopian tubes being secondary to that of the peritoneum, for he could not conceive such a slight tuberculosis of the peritoneum, which had given rise to no more permanent adhesions, and in no part had gone on to caseation, to be any other than secondary to a primary tuberculous in the generative organs.

ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

NERVOUS DISEASES AND INSANITY.

By Dr. R. S. STEWART.

Radicular Paralysis of the First Dorsal Pair, with Hemilateral Lesion of the Cord, of Traumatic Origin, simulating Syringomyelia. By Charcot (Archives de Neurologie, September, 1891).

—This is the case of a baker, 22 years of age, who was sent to M. Charcot by an expert as a case of syringomyelia. The history is as follows:—At 18 he was shot in the back of the neck, close to and to the right side of the seventh cervical spine, with a bullet, the immediate consequence of which was paralysis of the right limbs. At the end of five days he was able to walk, and in two and a half months he had completely recovered and returned to his work. Three years later, when raising a heavy weight, he suddenly experienced a violent pain between the shoulders, accompanied by a sense of suffocation. Weakness of the right leg was noticed next day, and this gradually increased, and was associated with rigidity. Soon after the right hand became weak and atrophied, and loss of sensation supervened in both arm and leg. The symptoms at the time of examination were dissociate anæsthesia (such as is found in syringomyelia) of the inner aspect of the right arm, atrophy of the thenar and hypothenar eminences and of the interossei and flexor muscles of the forearm, with reaction of degeneration; spasmodic paralysis of both lower limbs, much more pronounced on the right side; dyæsthesia of the left leg and corresponding half of the trunk, as high as the level of the axilla; spinal curvature (deviation of the 1st dorsal spine to the right, and from the 3rd to the 9th dorsal a regular scoliotic curve, with the convexity to the right); apparent diminution of the right eyeball, with sinking of it into the orbit; pupillary contraction and flattening of the face on the same side.

Syringomyelia is characterised by many of the symptoms present, but the conclusion arrived at is that the case is one of injury of the root of the first right dorsal nerve at the intervertebral foramen. The pronounced reaction of degeneration, and the absence of fibrillary tremors point to disease of the nerve itself, and not of its central nerve cells in the anterior spinal cornua.

The laminae of the seventh cervical and first dorsal vertebrae, which were found eburnated, were removed by the trephine; but no improvement had been recorded two months after the operation.
Cancer in its Relation to Insanity. By Snow (Journal of Mental Science, October, 1891).—The following are the conclusions arrived at by the writer of this paper:—

1. Cancerous disease among the insane is rare. Among individuals with congenital mental deficiency it seems to be almost wanting.

2. Cancer is not increasing in frequency among the insane. This fact is of no slight importance in connection with the view of cancer as specially a disease of civilisation, largely caused by depressive mental emotion; and with the explanation of its greater prevalence in recent years on the ground of the increasing wear-and-tear which nineteenth century life involves.

3. Cancer not uncommonly precedes and causes mental derangement without cerebral tumour formation. It should rank among the recognised causes of insanity.

Cases of Epilepsy treated by Hydrate of Amylene. By Dunn (Journal of Mental Science, October, 1891).—This paper is based on the results of the use of this drug in fourteen cases of epilepsy. All of these were chronic cases, with more or less secondary dementia; all in good health, and, with two exceptions, under previous treatment by bromide of potassium. The treatment by amylene hydrate was continued for twelve weeks, in half-drachm doses three to four times a day. The results are not very satisfactory. In two cases the number of fits was increased by one-fourth; in one the increase was slight; in four the number of fits was diminished; in three the number was practically the same under either treatment; and two died in status epilepticus. Of the two cases not previously treated by bromide, in one the fits diminished by more than one-third; in the other there was no apparent effect. During the first four weeks considerable mental improvement was noted, due probably to the cessation of the administration of the bromide, and the number of fits was small; but afterwards there was a marked tendency to run into the status. Prolonged periods of epileptic excitement were common, frequently alternating with periods of stupor, and in no case was there any ultimate mental improvement. The writer concludes that there appears to be no advantage to be derived from replacing the ordinary bromide treatment by this drug.

Pachymeningitis Hæmorrhagica Interna following Sunstroke. By Whitcombe (Journal of Mental Science, October, 1891).—This case is one of acute mania induced by sunstroke five months previous to his admission. It was characterised by persistent intense excitement, with numerous delusions and hallucinations, tremors of the hands and tongue, and embarrassment of speech. Death occurred twenty-six years after admission, and at the autopsy the dura mater was found lined with a thick, tough, leathery false membrane, composed of a dense fibrous outer layer and a delicate laminated inner layer, between which were numerous hæmatoidin crystals, fatty globules, and granular amorphous detritus.

Mental Disease following Influenza.—In the Deutsche Medizinal Zeitung for 3rd and 7th September there are references to various recent articles on mental disturbances following influenza—the quotations being from the Deut. Med. Wochenschr., Allg. Zeitschr. f. Psychiat., Med. and Surg. Report, and The Cinc. Lancet. Two of these articles merely give an account of one or two isolated cases, but in the others there are records of more considerable numbers of patients who had developed a psychosis following on influenza. Some of those referred to by Dr. Jutrosinski (Deut. Med. Wochenschr., March, 1891) were observed in Prof. Jolly's clinique in Strassburg. The conclusions in his paper are summarised as follows:—

1. When mental disease is brought on by influenza, in the great majority of cases the patients are of neurotic temperament.
2. The attack may come on in any stage of the influenza, but there appears to be a preference for the period of convalescence.
3. In the majority of cases the symptoms were those of melancholia and hypochondriasis.
4. Neither sex is specially liable.
5. Most cases occur between 20 and 50 years of age.
6. In the case of existing mental disease, influenza caused an aggravation in almost every instance.

With these statements may be compared the facts submitted by Dr. Miselbaum of Bonn (Allg. Zeitschr. f. Psych., Bd. 47, Hft. 1, 1886). He had patients of each sex, and of ages varying from 16 to 70. All of them had been for some time convalescent from the influenza attack, though suffering from lassitude and persistent sleeplessness. At the onset of the psychosis there was always acute delirium, of variable duration, which gave place, except in two cases, to a melancholia lasting for at least a fortnight. With Kraepelin, he does not consider that influenza of itself is sufficient to produce an insanity in a normal subject, but that there must always be other etiological factors. In any case, influenza must be considered along with other specific fevers which have mental diseases among their sequelae.

Miselbaum mentions other nervous diseases which he had met with after influenza (intercostal and supra-orbital neuralgias, and long continued sleeplessness). He advises special care in treatment and observation of cases during the period of lassitude following influenza.—J. H. C.

MATERIA MEDICA AND THERAPEUTICS.
By C. O. HAWTHORNE, M.B., C.M.

Common Errors and Fallacies in the Treatment of Children.
—In a post-graduate lecture on this subject, Dr. W. B. Cheadle discusses:—
1. Infantile Diarrhoea.—He combats the popular notion that a moderate amount of diarrhoea is not altogether a bad thing, and may act as a safeguard against convulsions. No attack, even though slight, can, he believes, be neglected with safety. The treatment must be both dietetic and medicinal. Cows' milk must be stopped, or at least only given when peptonised and diluted with barley water. All foods should be pre-digested. When there is a tendency to collapse, meat essence is very valuable. Dr. Cheadle recommends 10 drops of Valentine's juice in a dessert-spoonful of water every four hours.
With regard to drugs, he finds astringents, such as logwood and catechu, useless in the acute stage, and opium in some form essential in anything like a severe case. Subnitrate of bismuth, in 5 to 10 grain doses, and chalk and liq. opii sed (1/4 to 1 min.) are his most trusted remedies. When there is much vomiting, he gives small and frequent doses of grey powder and Dover's powder.
2. Chronic Constipation.—Dr. Cheadle notes the difference between the routine treatment of this condition in adults and in children—the former are sensibly given a dinner pill or sent to drink laxative waters at a spa; the latter too frequently are treated by occasional doses of strong purgatives, repeated enemata, or the addition to the diet of coarse foods and fruits, which may do good in slight cases, but which, if they fail, make matters worse by favouring hard accumulations. He refers to a number of extreme cases, and speaks of the good results following the use of strychnine, belladonna, and saline laxatives, such as the sulphates of sodium and magnesium.
3. Night Terrors.—The most frequent error in the treatment of this condition is to regard the whole manifestation as neurotic, and so to be content to dose the
patient with such sedatives as bromides and chloral. The treatment needed is the discovery and removal of the cause of the undue nervous activity—constipation, worms, hepatic disorder, uric acid gravel, &c.

4. *The Use of Antipyretics in Acute Disease.*—These drugs are, Dr. Cheadle considers, too readily resorted to, though he freely admits the value of such antipyretic agents as the cold bath, cold pack, and ice bag in cases of hyperpyrexia; but he regards the mere forcing down of the temperature, when pyrexia exists, by the use of drugs as futile, and points out that this result is obtained in most cases only at the expense of depressed cardiac action and the danger of collapse.

5. *The Local Treatment of the Throat in Diphtheria.*—Brush out the throat with caustic solutions, or with astringents, as perchloride of iron, &c., Dr. Cheadle firmly opposes, both because of the difficulty of application and also because abrasion of the surface of the fauces gives, he believes, new opportunities for the absorption of local poison. "Insufflation with iodiform or sulphur, or spraying with boric acid or corrosive sublimate solutions, are far more easy of application, and more effectual in antiseptic action."

Other errors in treatment which Dr. Cheadle refers to are—Oppressive politicking in pneumonia, obstructive to respiratory movement and tending to increase the body heat; the administration of emetics in diphtheritic croup, which is utterly ineffectual, except to depress and exhaust the patient; the too frequent purging of rickety children suffering from laryngismus and convulsions, under the belief that the sole cause of the evil is intestinal irritation; the habit of indiscriminately ordering iron syrups or cod-liver oil for pale or weakly children, who often require rather a more careful dietary and some corrective of disordered digestion—e. g., calomel, grey powder, saline laxatives, &c.—(*Practitioner*, July, 1891.)

**Iodide of Potassium in Angina Pectoris.**—Dr. Lauder Brunton contributes to the October number of the *Practitioner* a paper on "Cardiac Pain and Angina Pectoris," in which, after speaking of the value of nitrite of anil, nitro-glycerine, nitrite of sodium, &c., as agents by which the blood pressure may be rapidly diminished and the attacks of angina relieved, he states that "first and foremost, amongst the drugs that are really efficient in tending to prevent the recurrence of the attacks in angina, comes iodide of potassium in doses of 5 to 30 grains three times a day. Whether it acts as a simple eliminant, or whether it tends to increase the blood supply to the heart by causing absorption of the deposits which block the coronary arteries, or whether it acts in some other way, we cannot tell; but about its practical use there can be no doubt whatever."

**Poisoning by Gelsemium Sempervirens.**—The following effects are recorded by Dr. Edward Jeppson as following the administration of the tincture of this drug:—The dose employed was at first 10 minims every two or three hours, and at the expiration of twenty-four hours three or four 20 minum doses were taken at intervals of three hours. Patient was unable to speak, and only swallowed with difficulty, having lost all power over the tongue. There was also general muscular weakness. The pupils were dilated widely, and vision was indistinct. Consciousness was unaffected, the patient moving her head in response to questions. Stimulants and the subcutaneous injection of strychnine were employed with a satisfactory result.—(*Brit. Med. Jour.*, 19th September, 1891.)

**Treatment of Vomiting of Pregnancy.**—In a paper read before the Harveian Society, on severe attacks of this condition, Dr. Amand Routh states that he has for seven years successfully employed the following solution as an application to the cervix and cervical canal:—Iodine, iodide of potassium, rectified spirit, water—equal parts. In no case did he experience failure, though occasionally a second application was required on account of
the return of the vomiting. This usually caused permanent arrest.—(British Medical Journal, 13th June, 1891.)

**Sulphonal.**—The insolvibility of this drug and the consequent delay in its action have undoubtedly retarded its popularity. Dr. David Stewart, of Philadelphia, suggests the following method of administration:—Stir the sulphonal in a tumbler, two-thirds full of boiling water, until entirely dissolved. When the solution has cooled to a drinkable temperature, let the patient drink it off. In this way the sulphonal is taken in solution, and is rapidly absorbed, the gastric vessels being dilated by the heated fluid.—(Philadelphia Medical News.)

**Fluid Belladonna Plaster.**—In the recent edition of the Unofficial Formulary issued by the British Pharmaceutical Conference, a convenient substitute for belladonna plaster is introduced. It is named “Collodion of Belladonna,” and is made as follows:—

- Alcoholic extract of belladonna, . . . . 5 ounces.
- Spirit of camphor, . . . . . 2½ fl. ounces.

Dissolve, and add flexible collodion sufficient to produce 1 pint.

**Determination of Sugar in Diabetic Urine by the Muscimetric Method.**—The following is from the American Druggist:—Prepare a 1 per cent solution of grape sugar in healthy urine, pour it on a soup plate; on another plate pour an equal volume of the diabetic urine; evaporate both to a syrupy consistence, then expose both plates in a place where there are flies. After ten or fifteen minutes count the flies on each plate, divide the number on the diabetic urine by the number on the grape sugar solution, which will give the percentage.

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**MEDICINE.**

By JOHN H. CARSLAW, M.A., M.B., C.M.

**Croupous Pneumonia in Children.**—In the Archives of Pediatrics for September, there is an article by Dr. S. Henry Dessau on the treatment of croupous pneumonia in children, in which he gives what he considers to be the true therapeutic indications, besides discussing the best methods of carrying these out. His position is that the natural course of the disease, especially in children, is to recovery, and the duty of the physician is merely to assist nature, interfering as little as possible. The dangers to be feared are hyper-pyrexia, an apathetic condition, the presence of serious albuminuria, and, most important of all, the tendency to heart failure. The last mentioned he enters into in considerable detail, regarding it as not due principally to the high temperature, causing degeneration of the cardiac muscle, but to the mechanical difficulties the heart has to overcome. Dr. A. H. Smith had drawn special attention to this aspect of the question, in a paper on “Some Considerations in regard to Acute Obstructive Diseases of the Lungs,” which he read before the Berlin Medical Congress in 1890, and he had shown that “the right heart, and not the heart as a whole, was the main source of exhaustion, and that it was far safer to watch the pulmonary second sound of the heart than the pulse, as a danger signal of this condition.” The pulmonary circulation becomes engorged, and it is to be remembered that the seriousness of a case is always much greater where both lungs are involved. At the same time, through “the action of the disease-poison upon the vaso-motor centres, and an effort at physiological compensation for the undue blood supply to the diseased lung,” there is a contracted condition of the systemic arterioles. The left
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heart then comes to act more vigorously, and the whole heart to beat more quickly, while the right heart becomes engorged and dilated without compensatory hypertrophy. In children the heart can stand this strain better than in adults—hence the better prognosis in the case of children. There is also to be considered the action of the poison, as it circulates, upon the cardiac nerve-centres.

These being the dangers, how are they to be met? In assisting nature, one must follow the methods she selects for a favourable termination; that is always attended by profuse perspiration. Simple diaphoretics are therefore recommended to be given internally, and the different forms of bathing to be applied to the skin along with friction. (Exception must, however, be taken to Dover's powder being mentioned as one of the remedies to be given internally). "By the production of diaphoresis an opportunity is certainly afforded to relieve the congested condition of the diseased lung, by inviting more blood into the dilated cutaneous vessels; at the same time an effort is made to eliminate some of the morbid poison circulating in the blood." A similar relief to the pulmonary circulation can be obtained by acting through "the liver and its collateral circulation," which may become a "compensating reservoir, so to speak, for the vascular mechanism," while the increased flow of blood to the liver stimulates the functions of that organ, one of which is to destroy the "poisonous products, or ptomaines, generated in the system." With this in view, calomel in moderate doses may be given, and it may have the further advantage of acting as a diuretic and assisting in the elimination of the poison and fever products through the kidneys.

Aconite is recommended in small repeated doses at the onset of the disease because of its diaphoretic action, and because it slows the heart, and thus gives it a better opportunity to relieve itself. Digitalis and carbonate of ammonia are to be avoided. The various forms of blood-letting are passed over without mention.

In regard to local treatment, warmth and cold are both favourably spoken of—the former principally because of its assisting diaphoresis; the latter because it reduces temperature and strengthens the heart.

The above conclusions are thus summarised:—"The most successful methods (of treatment) apply to the principle of dilatation of the cutaneous blood-vessels and the effort to maintain this condition, thereby producing diaphoresis and at the same time reducing the temperature. This is the most rational and surest manner of relieving the overcrowded heart, and, in consequence, guarding against the tendency to dilatation of the right heart and subsequent paralysis of that organ. If the morbid poison is to be regarded as an important factor in the production of cardiac failure, by its action upon the nerve-centres, as in all probability it may be, then there is no better plan that I can conceive of than to aid in its elimination through the emunctories of the skin, and its destruction by the physiological function of the liver."

Multiple Neuritis with Double Facial Palsy after Influenza.—In the Norsk Mag. for Lægevidenskaben, No. 11, 1891, there is recorded by H. J. Thue a case, of which the following are the leading points:—

The patient was a strong man, 33 years of age. On 7th January he had an attack of influenza, but on the 13th he returned to work though feeling still weak. On 19th January he had again to take to bed, and soon he had almost complete loss of power both in arms and legs, as well as paralysis of both sides of the face. Taste was lost for some days. Sensation was slightly interfered with, but the bowels and bladder were unaffected. The condition lasted for three weeks, and then he improved, and fourteen days later was able to rise. Treatment was by the faradic current and tinct. nuc. vomic.

On 6th March there was still double facial palsy with "reaction of degeneration" on both sides. There was no paralysis of accommodation and no
diplopia. At that date, too, patient felt otherwise quite well, and could use his arms and legs, though they soon grew tired; patellar reflexes were absent, and the sensation in both legs rather defective. Electrical reactions were normal in both arms, and in the legs altered merely quantitatively, both for nerves and for muscles.

The patient's condition improved visibly under the use of the constant current, and by the beginning of June the facial palsy had gone and the electrical reactions on both sides of the face were normal. Some stiffness or contracture of the muscles, affecting the features about the mouth, subsequently came on, but was very slight, though still present on 10th August. Patellar reflexes returned.

The case is regarded as one of poly-neuritis, such as occasionally is met with after other specific fevers. There does not seem to have been any doubt as to the primary illness being influenza.—Deut. Med. Zeitung, 6th August, 1891.

Case of Multiple Neuritis in Arsenic Poisoning.—In connection with the occasional production of multiple neuritis by arsenic when used as a drug, the following case is of interest. It was published in the Bost. Med. and Surg. Journ., cxxxiii, No. 20, 1890, by Dr. Cutter of Boston. The patient was a shoemaker; and at his work, for more than a year before he came under observation, he had been in the habit of taking green coloured slips of paper into his mouth. His first symptom was weakness in the right hand, with a feeling of numbness and pricking of the fingers. A few days afterwards there developed a similar feebleness in the left arm and in both legs, associated with cramps in the muscles of the calves. There was slight tenderness of the muscles of the extremities; knee reflexes absent; superficial reflexes diminished. Arsenic was found in the urine. There were no other symptoms present; in particular, there was nothing to suggest lead poisoning. Under observation the atrophy and weakness of his muscles increased; but ultimately he made a good recovery, though still subject to shooting pains in the muscles of the limbs from time to time. The patellar reflexes are not constantly present. Arsenic was found in large quantity in the paper referred to.—Deut. Med. Zeit., 13th August, 1891.

Mechanical Treatment of Chronic Constipation.—The particular variety of cases of constipation, in which the following treatment is recommended, is that with intact mucous membrane, but with the expulsive forces deficient in power to produce evacuation—either because of meteorism or because of weakness of the abdominal walls, or through the constipation being associated with cardiac or renal disease, or with some other circulatory disturbance of the veins of the bowel, such as hemorrhoids. In such conditions purgatives are said to be harmful, because by the increase of its fluid contents the muscular coats of the bowel are further relaxed, and congestion of the mucous membrane, if present, is aggravated by the use of drugs. Massage and electricity may also fail, as also any attempt to strengthen the muscles of the abdominal wall alone. The method recommended by Dr. L. Felchenfeld of Berlin is compression of the abdomen, by means of which the lumen of the bowel must be diminished and the accumulation of gas lessened, while at the same time the muscular coats of the bowel are stimulated by the relief to their relaxation. A stimulation of the nervous plexus is also considered probable. The compression is carried out by a pillow, in which a considerable quantity of small shot is introduced in different layers separated by wadding, and thus a powerful but uniform pressure is obtained. A pillow of this kind is fixed on the abdomen for a stated length of time, sometimes being left on all night. It was found that usually one half to one hour was sufficient to induce a natural movement of the bowels, and it is recommended that the pillow should be applied for half-an-hour before rising in the morning. The results obtained have been highly satisfactory, even in one or two cases where there was
constipation with hemorrhoids without any tympanites, the explanation then being thought to be that a favourable influence had been exerted on the circulation.—(Deut. Med. Zeit., 17th September, 1891.)

Treatment of Intestinal Obstruction by Electricity.—In the Académie de Médecine, on 29th September, Dr. Semmola (Naples) communicated a case which he thought showed that intestinal obstruction may exist from a temporary paralysis of the bowel, due to a defect of innervation. In his case the use of the constant current had produced a remarkable beneficial effect.

The patient was a lad of 20, in whom, during recovery from a complicated attack of typhilitis and peri-typhilitis, there had been some error in diet, upon which a severe diarrhoea had been set up, in turn succeeded by vomiting, diminution of the urine, and constipation. Ordinary treatment had failed, and laparotomy had been proposed, when Dr. Semmola was called in in consultation, and diagnosed obstruction through defect of innervation; he advised electrical treatment. The position pole of a Daniell apparatus giving 10 milliamperes was introduced into the rectum, while the negative pole was moved over the course of the colon. This was done for ten minutes thrice daily, and after the third application the ischuria ceased and the colic grew less intense. At the end of the third day there was a spontaneous evacuation of the bowels, and after continuing the treatment for other two days the functions of the intestine were completely restored.—(La France Médicale, 2nd October, 1891.)

PATHOLOGY AND BACTERIOLOGY.

By R. M. BUCHANAN, M.B., C.M.

A Collection of Illustrative Cases of Primary Tumours of the Heart. Jürgens (Berl. Klin. Woch., 13th October, 1891.)—Tumours of the heart are in general so rare that in the discernment of heart diseases a clinician thinks more readily of all other conditions rather than of the existence of a tumour. The collection of cases has been, on the part of pathological anatomy, extraordinarily increased in the last three decades. From the considerable number of these publications, it is seen that almost every tissue of the heart can give rise to a tumour formation. With tumours of the heart, as with those of the central nervous system, a fatal issue is dependent not so much upon whether their histological arrangement follows the malignant or non-malignant type, as upon the attainment of a certain size on the part of the growth.

The already recorded cases show important differences, according as the tumours are situated in the pericardium, the muscular substance, or the endocardium. This diversity in the position of the neoplasma naturally gives rise to a corresponding variety of functional derangements, which may be grouped in nearly the same manner as the complex symptoms of the different forms of peri-, myo-, and endocarditis. The author records cases illustrating four forms of cardiac tumour.

1. *Fibroma.*—Tumour the size of a cherry broadly attached to the anterior wall of the right auricle. The endocardium of both ventricles showed a diffuse fibrous thickening in several places. It is suggested as not improbable that the tumour in the auricle, and the endocardial thickenings in the ventricles, originated at the same time and from the same cause. The patient, a child of 10 months, exhibited no cardiac symptoms, and died apparently from tuberculosis.

2. *Fibro-myxoma Polyposum.*—The middle of the anterior wall of the left auricle has attached to it a pedunculated tumour about the size of a walnut.
It is 3½ c.m. long, and hangs down club-like, so that the lower end is within the lumen of the mitral valve, almost completely filling it. Microscopically, the tumour is a very vascular fibro-myxoma, containing an extraordinary quantity of brown pigment. Notwithstanding the great obstruction of the mitral valve, and also great distension of the left auricle, there was no hypertrophy of the right ventricle. The heart is noted as being uncommonly small. The patient was a labourer, aged 50, and the clinical observations of his illness do not indicate the presence of any cardiac lesions. The autopsy, however, showed edema of the extremities and external genitals. Cases of this kind have already been described. Kottmeier records one on which a 2-inch long fibroma hung from the septum auriculorum into the lumen of the mitral valve. An analogous case is communicated by Boström, in which a telangiectatic fibro-myxoma of the left auricle caused the sudden death of a woman 80 years old.

3. Fibro-sarcoma.—A diffuse infiltration of the wall of the right auricle to the thickness of the thumb, extending to the anterior segment of the tricuspid and along the chordae tendineae. The valvular segment at its insertion is almost the thickness of the little finger, and the lumen of the valve is greatly reduced. Microscopic examination gave marked fatty metamorphosis of the heart and "small celled infiltration" of the affected part. The question of syphilis is raised, but is dismissed in the absence of other evidences of the disease, and in the absence of fatty metamorphosis in the elements of the new growth. The patient, a man aged 36 years, died suddenly on the street.

4. Gummata Intra-parietalia.—On the wall of the right ventricle a number of slight prominences is observed forming the apices of tumours having their seat in the substance of the heart muscle. Similar tumours are also interpersed through the septum ventriculorum. Other changes due to fibrous thickenings of the tissues are noted. The histological examination showed the characteristic structure of gummata, and the simple connective-tissue hyperplasia of syphilis. Such a severe form of heart syphilis is uncommon. The patient, a young woman of 18 years of age, had complained of palpitation of the heart for 8 days, and died suddenly. There were no other evidences of syphilis.

Aneurysm of the Renal Artery. Oestreich (Berl. Klin. Woch., 13th October, 1891).—Aneurysm of the renal artery is of extremely rare occurrence. If 80 to 90 per cent of all aneurysms be credited to the aorta (Emmerich) a mere fractional part of the remainder belong to the renal arteries. Two cases are recorded by Dr. Oestreich.

Case I.—Sacciform aneurysm of a branch of the left renal artery, situated within the kidney.—Widening and twisting of the renal arteries (especially the left) by endarteritis chronica deformans—Eruption of the aneurysm through the pelvis of the kidney—rupture—death from hemorrhage.—The patient, a woman aged 50, began to complain of weakness about a year previous to admission into the Charité, and several months later suffered from a severe apoplectic attack. Bleeding from the genitals commenced twelve days before admission to hospital, the blood coming in gushes at a time (nemostruin), and violent pain in the abdomen appeared at the same time. The bleeding became more copious from day to day, and the patient was so weakened as to be unable to stand. From the fourth day the blood had a bad odour, and latterly the smell was quite intolerable. On admission a large swelling was felt in the situation of the left kidney (due to hemorrhagic infiltration of the retro-peritoneal tissue, as was subsequently discovered), and the case was diagnosed as a malignant (?) growth of the kidney.

Case II.—Sacciform aneurysm of the trunk of the right renal artery, situated without the kidney.—The patient, a young man, died of malignant endocarditis, and an aneurysm, the size of an apple and completely filled with thrombus, was discovered post-mortem. During life there were no symptoms pointing to the existence of the tumour.

A third case, reported by Armstrong in the American Journal of Medical
Science for October, 1885, is cited as illustrating a suddenly fatal termination. A man, 50 years of age, with tumour of the right kidney, died suddenly, and it was found that an aneurysm of an interlobular artery had ruptured under the capsule, and that tearing of the latter had taken place, with escape of the blood into the peritoneal cavity.

The Etiology of Empyema in Children. Koplik (Internat. Jour. Med. Sc., July and August, 1891).—It has been shown by A. Fränkel and Weichselbaum that several forms of bacteria are intimately associated with the production of empyema in the adult, and that empyema, viewed from a bacteriological standpoint, is a condition admitting of division into several varieties. Koplik has sought to find, by an experimental and clinical study, how far the results in children correspond with those attained in the adult, or whether they differ. The enquiry shows that in the child, as in the adult, the micro-organisms found in the pus are practically limited to four—namely, the streptococcus pyogenes, the staphylococcus pyogenes aureus, the diplococcus pneumoniae, and the tubercle bacillus. Fourteen cases are recorded as having been examined, and it is certainly striking that in nearly all the cases these organisms were not associated, but existed alone in the pus, as might be said, in pure cultivation.

From the clinical and bacteriological standpoint the cases arrange themselves into four groups:—

Group I includes the cases in which the staphylococcus pyogenes aureus or the streptococcus pyogenes was found. These were cases, as it happens, in which no extraneous source of infection was discovered. The children, four in number, had been ill with symptoms of pulmonary trouble for periods varying from one to six weeks. It has to be said that the absence of Fränkel's pneumococcus here does not disprove the possibility of its presence at some early stage of the empyema; and, on the other hand, Weichselbaum has demonstrated that both the streptococcus and staphylococcus pyogenes exist in the lungs of pneumatic patients.

Group II comprises empyemas complicating or following a pneumonia, and showing in the pus the pneumococcus of Fränkel. In two of the cases belonging to this group the pleuritic fluid, when first withdrawn from the chest, was serous in character—in one case even devoid of fioculi. In both of these cases the exudate taken later with an exploring syringe was markedly purulent, and both cases were operated upon. In the serous fluids first obtained, as also in the purulent exudate, the diplococcus was found. This shows distinctly that, though an exudate may be serous at first, it may subsequently become markedly purulent, not on account of anything introduced into the chest on the occasion of the first puncture, but from the continued action of micro-organisms already present (diplococcus pneumoniae or streptococcus pyogenes Fränkel). If an exudate contain streptococci, even though serous, we can with certainty predict the advent of pus (Fränkel). We might make a similar assertion of fluids containing the diplococcus pneumoniae. If a serous fluid withdrawn from the chest fails to reveal any micro-organisms upon stain or culture, we can conclude that there is a probable tubercular element in the pleurisy (Fränkel). If such a serous exudate subsequently shows the presence of micro-organisms (streptococci), and then becomes purulent, we can suspect contamination.

Group III is reserved for a case of empyema of a tubercular nature. (That only one case falls to this group is rather surprising in view of the prevailing belief that the majority of cases in practice are of this nature.) "The exudate had to be repeatedly examined in order to establish the presence of tubercle bacilli." Streptococci were present from the first. The lungs yielded no evidence of involvement. The patient, a boy of 8 years, had had, however, several bronchitic attacks years before the advent of his empyema. Fränkel had cases of tubercular pleurisy in the adult in which he failed to find tubercle bacilli. The absence of tubercle bacilli is explained in two ways, by Ehrlich: — "1. The
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fibrin formations in the exudate remove the bacilli by enclosing them. 2. Thickening of the pleura by adhesions causes a resistance to the transmigration of bacilli. In empyemas the bacilli are more numerous than in simple pleuritic exudates, because cells passing in myriads into the exudate are more apt to carry bacilli with them. Israel and Gerhardt think that the bacilli rather become entrapped in the miliary growths of the pleura, and thus do not pass into the exudate.

Group IV shows a case of empyema presumably secondary to a suppurative process in another part of the body. A streptococcus existed alone, and appeared much more virulent than the organism obtained from cases of Group I.

In two of the cases in which drainage had been imperfect the pus assumed a fetid odour. From one of these cases a short, rather thick, bacillus was cultivated, producing a greenish colour and a mawkish odour.

A Contribution to the Etiology of Trismus or Tetanus Neonatorum. Peiper (Deut. Arch. f. Klin. Med., October, 1890.)—Evidence is accumulating to show that trismus or tetanus neonatorum is etiologically the same disease as tetanus of the adult. We have here the history of four cases. The symptoms appeared on the fifth day in three of the cases, and on the seventh day in the remaining one. One died on the fifth day (after birth), one on the sixth, and two on the eighth. Animals (mice and rabbits) inoculated from (the navel of) each case died in the usual course of tetanus. In two of the cases the bacillus of tetanus was demonstrated in the navel.—(Med. Chron., January, 1891.)

On the Influence of Acids and Alkalis on the Alkalinity of the Blood in Man, and on the Reaction of the Urine. Freundberg (Virch. Arch., Band 125, Heft 3.)—Until recently little was known concerning the alkalinity of human blood under normal and pathological conditions. Moreover, although the question has been much discussed lately, observers are still much at variance in their results. In some pathological conditions the alkalinity of the blood is diminished, in others increased, and the question arises whether the administration of alkalis and acids in these respective conditions would have a therapeutic value.

In his investigation, which was undertaken at the instance and under the direction of Professor Sahl, the author sought to determine whether the administration of acids and alkalis modifies the alkalinity of the blood. A series of over forty patients were examined at the outset, serving not only to give sufficient practice in the methods of testing, but to show that the alkalinity was diminished in a case of chlorosis, in one of puerperal anaemia, and in one of nephritis with marked anaemia.

The method employed was that of Von Jaksch, somewhat modified by Professor Sahl. The results of the experiments are tabulated, and a résumé of the general results is as follows:—

a. The alkalinity of the blood was not changed in all cases, with one exception, by 4 to 8 grammes of hydrochloric acid daily. The acidity of the urine increased in all these cases; in a case of cystitis the strongly alkaline urine became ultimately acid.

b. The alkalinity of the blood was diminished about ¾ to ½ by 10 to 30 grammes of lactic acid daily. The examination of the urine showed that thereby the acidity of the urine also increased, but not to any significant extent. This increase accords by no means with the quantity of acid administered, so that it must be concluded that the great part of the lactic acid was converted into CO₂ and water. Cantani's view (Bd. ii, 8, 230, 1880) that lactic acid is the most suitable and most effective acid to produce acidity of the urine is therefore not confirmed by the present experiments.

C. The alkalinity of the blood was diminished about ¾ in the average, by 5 to 10 grammes of tartaric acid per day. The acidity of the urine was thereby
increased in all cases with one exception, but the increase in the acidity was not commensurate with the amount of acid administered, so that here, also, the greatest part was decomposed in the body.

d. The alkalinity of the blood was increased in three cases about \( \frac{1}{4} \) by 5 to 15 grammes of bicarbonate of soda daily; in two cases no change took place. The urine became thereby strongly alkaline.

Thus, it is evident that the alkalinity of the blood is not influenced in all individuals by acids and alkalis, whilst the urine is in almost all cases rendered more acid or alkaline.

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DISEASES OF THE EAR.

BY DR. WALKER DOWNIE.

Diagnosis, Prognosis, and Treatment of Progressive Deafness in Chronic Non-Suppurative Inflammation of the Middle Ear.—From the frequency with which this condition is met, and on account of the want of success in most cases following the use of recognised remedial measures, anything which can throw light on its pathology is interesting to aurists. But notwithstanding the careful researches of Professor Gradingo, of Turin, here given, little is told which is not already well known to all intelligent aural surgeons. Progressive deafness may result from pathological changes in the membrana tympani and Eustachian tube, or these may begin in the vestibular wall, resulting in stapedio-vestibular ankylosis, and in a third set of cases the inner ear is affected.

Where the pathological changes are limited to the membrane or Eustachian tube, improvement may follow on well directed treatment, but the other forms are less amenable to treatment, and usually lead on to a degree of deafness which in time may become complete. As a result of Professor Gradingo's experience, he recommends treatment of the naso-pharynx, especially in the neighbourhood of the openings of the Eustachian tubes, by the application of such means as will influence the vitality of the tissues pathologically altered. Amongst other things he employs galvano-cautery, nitrate of silver, and iodine; and when hypertrophies are removed he employs the air-bag, catheter, or bougie, by which means, in a large proportion of cases, he gets satisfactory results.—(Archives of Otology, July, 1891.)

The Use of Electricity in Chronic Affections of the Middle Ear.—Dr. Baxter, Bangor, Maine, reports on ten cases in which he used the constant current. Those cases had been under ordinary treatment—infan-

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successful, and warrant a further trial of the same treatment.—(Archives of Otology, July, 1891.)

Excision of the Membrana Tympani, the Malleus and Incus.—In the Journal of the American Medical Association for 28th September, 1891, there is an article by Dr. Charles H. Burnett on the above as a means of treatment in otitis media catarrhalis chronica, and in otitis media purulenta chronica. The operation, as carried out by Dr. Samuel Sexton, was noticed in Abstracts on Diseases of the Ear published in August. A somewhat similar method is pursued by Dr. Burnett. The most favourable part of the conclusion which he draws from his results is that "vertigo, headaches, tinnitus, and the ordinary attacks of ear ache from 'gatherings' so common in chronic otorrhoea in children, are entirely and permanently relieved by the excision of the necrotic remnants of the membrana tympani and the two larger ossicles."

Colloidion in Relaxation of the Membrana Tympani.—The use of colloidion for the relief of relaxed membrana tympani was first suggested by Dr. M'Keown of Belfast. He recommended it to be painted over the membrane, and as it dried and contracted, it dragged the membrane into proper position and fixed it there. Dr. Lannois of Lyons here details two cases in which he has employed colloidion. He recommends that the tympanic membrane be placed in proper position by inflation; then, in place of painting surface of drum head, to have a few drops of colloidion dropped into the ear. He finds that not only is the patient relieved while the colloidion is in position, but that after the colloidion film is removed the patients continue to have improved hearing power.—(Annales des Maladies de l'Oreille, &c., January, 1891.)

Hemorrhages into Labyrinth during Pernicious Anemia.—Dr. J. Haberman, of Prague, reports in the Prager Med. Wochenschrift, the case of a young woman about 20, who, a short time before death from anemia, became deaf. At the post-mortem examination all internal organs were found extremely anemic, with hemorrhages into the meninges, the brain, pericardium, pharynx, intestines, and retina. Numerous minute hemorrhages were found in the cochlea, in the vestibule, and in the semi-circular canals. Those hemorrhages Dr. Haberman thought accounted for the deafness and soundings in the ears complained of before death, and the vertigo may have been caused either by the hemorrhages found in the semi-circular canals, or those described in the brain.

Vesicles in the External Auditory Meatus.—Dr. H. L. Swain gives details of five cases of vesicles occurring in the external ear and upon the membrana tympani, which have been met by him during the past two years. The condition is rare judging from published statistics. His five cases occurred during and immediately subsequent to the epidemic of influenza (1889-90), all being seen within a few months. He considered that la grippe was responsible for the sudden appearance of so many cases in so short a time, and that the pathological condition necessary to their production is the same as that which results in herpes.

He also reports, in same paper, two cases of hemorrhagic vesicles of the external meatus. There also followed an attack of influenza; occurred in patients each 22 years of age, were accompanied by excruciating pains, and both were relieved by puncture.—(Archives of Otology, July, 1891.)


The Neuroses of Development, being the Morison Lectures for 1890, by T. S. Clouston, M.D. With Illustrations. Edinburgh: Oliver & Boyd. 1891.


An Introduction to Human Physiology, by Augustus D. Walker, M.D. London: Longmans, Green & Co. 1891.


Origin, Purpose, and Destiny of Man, by Wm. Thornton. Boston: Published by the Author. 1891.


GENTLEMEN,—It is a custom hallowed by long antiquity, and possibly more honoured, however, in the breach than in the observance, that when a teacher makes his début to his class, he is expected to deliver an introductory address, the subject of which, by general consent, ought to be of a semi-professional nature, and, if possible, one engaging attention at the time. After the magnificent address which you heard last week from the learned Dean of this old, and, I venture to add, honoured and honourable school—an address—and I do not use the language of mere conventional eulogy—which, for elegance of diction, close reasoning, general intellectual culture, and roseate imagination (welling, as I diagnose the case, from a youthful sanguine temperament) would be creditable to any university in this or in any other country; I say, while the reverberation of Professor Watson's stately periods is still ringing in your ears, you can understand at how great a disadvantage I find myself in the endeavour to discharge my present function. Professor Watson's eloquent address was beatifically constructive. The sentiments which I have the
honour to address to you will proceed on somewhat different lines—lines with which I am probably more familiar—the destructive. Both processes are essential in evolution—the one is the complement of the other. "Oh, that mine enemy had written a book!" exclaims the envenomed reviewer of old; "or delivered an introductory address," adds the modern critic. I am thus quite alive to the risks which I run; but I have always considered if there be one luxury greater than another which life has to give me, it is the luxury to think what I like, to learn what I like, and to express what I like, where and whencsoever it seems to me expedient to do so; or, as the sentiment is better expressed in the dignified language of Plautus, "Rara temporum felicitas, ubi sentire quae velis, et quas sentias discere licet." It is the apostolic injunction to be all things to all men; but I humbly differ even from the apostle, holding that the man who is all things to all men can be very little of anything to himself. And if the luxury of thinking and acting for one's own self be an expensive one, it must not be forgotten that the bounds of liberty are widened, and the good of mankind is advanced over the prostrate forms of reformers. The individual may die, but the race is more and more.

Now, gentlemen, every quarter, I should think, yearly, the din of academic battle and the clash of arms disturb our serenity. The Armageddon of muralism and extra-muralism is being fought at our very doors. Hosts encounter hosts. They close—they fall. The Church militant is there with foaming mouth and gory phylactery, fighting the battle of oppression, which has been ever synonymous with the name of ecclesiasticism. Her hysterical shrieks, as the vulnerable heel is pierced, make night hideous. The defenders of liberty and reform are led by one whose polemical skill and undaunted perseverance must command the admiration of all; whose slogan seems to be "L'audace; encore l'audace; et toujours l'audace; lapis gutta cavetur non vi sed sepe cadendo." In modern Athens a commission of potent, grave, and reverend seigniors is sitting in the secrecy of a star-chamber determining the fate and interests of the much-tossed-about medical student. Some of the best legislation of a country consists in the repeal of former enactments, and it is an open secret that the loosening of bonds which never should have been tied is the ostensible object of this Royal Commission. Gentlemen, if there be one thing on earth which should be as free as the winds of heaven, it is the right to impart knowledge, no less than the inalienable right, if a man feels so inclined, to make
that knowledge a marketable commodity. Nothing is more
tenacious of life; nothing dies harder than a corrupt and a
profitable monopoly. It is surely superfluous to argue at
this time in the world's history that it should matter little to
an intelligent or a discriminating public where or from whom
a man receives his knowledge, providing he gives satisfactory
evidence of the possession of it. To me it is incomprehensible
why the right and the fitness to impart knowledge should be
determined by the accident that a man's father or his grand-
father had rendered service, noble or ignoble, to some prominent
or lecherous politician or patrician. It requires no argument
to demonstrate that monopolies of every kind are subversive
of the best and the highest interests of the people; and that of
all monopolies, monopolies of learning are the most wicked
and the most indefensible. It requires no argument to de-
monstrate that such monopolies tend to sloth, corruption, and
inefficiency; or that in the matter of learning and intellectual
attainments, as in everything else, the fittest should and must
ultimately survive. In order that you may arrive at an
intelligent comprehension of the aims of university reformers,
allow me to present to you as a point d'appui, a short glimpse
of the early history of the University of this city. The
University of Glasgow, the alma mater—the alma proovia—
the dear great-grandmother of so many of us, was established
by a bull of Pope Nicholas V in the year 1450. Under this
bull the obligation imposed on all graduates, no matter in
what faculty, was to teach. The brevium or diploma which
they received on finishing their studies constituted them
teachers under the name of Doctores and Magistri. In this,
the original charter of the University of Glasgow, it is
ordained that those who have finished their studies, and are
found duly qualified, shall obtain "Docendi licentiam, ut alias
erudire valeant;" and, on referring to the parchment which
I received on the, to me, hallowed banks of the Molendinar, I
find it declared "Cuique potestatem damus plenissimam de re
Medica legendi, docendi consultandi, scribendi et disputandi
in cathedram doctoralem ascendendi." No doubt some wicked
people may insinuate that I have all my life-time indulged the
"protestatem plenissimam scribendi et disputandi," though
I have never occupied the "cathedram doctoralem" till now,
and that not by the grace of the University of Glasgow. But
supposing any other gentleman less aggressive than I—any
gentleman of more conspicuous negative virtues than I—
presented himself to the Court or Senate of the University
of Glasgow, with that parchment over which many a frugal
father has gazed with pride, and many a doting mother shed tears of joy, demanding the right ostensibly conferred on him by the University “in cathedram doctoralem ascendendi,” do you not think that his temerity would be rewarded by a descendendi to the double-quick in the direction of the Western Medical School? The men of learning and the men of sanctity would not dissemble their love, but they would kick him down stairs. Not only were the graduates the teachers recognised by the original constitution of the Universities, but they were under an obligation to teach when called upon by the University to do so, so that there might be no disadvantage to the University from want of teachers. The graduates employed in teaching received certain fees from those whom they taught. In order to relieve the students from this burden, and to secure the permanence of distinguished teachers in the University, it was at length enacted that some of the more eminent graduates should receive salaries on the condition of their teaching gratuitously. I venture to state that, if this rule were still in force, we would hear little of the segmentation of classes, or the clamant abuse of so-called “practical” classes. Thus was inserted the thin edge of the wedge in a mischievous monopoly. The obligation on the graduates to deliver lectures was only enforced when a sufficient number of voluntary teachers did not come forward, and hence the granting of salaries dissolved the obligation, for then, as now, the salaried graduates or professors had a keen sense of the dignity and importance of the “bawbee.” It followed from this, in turn, that when the non-salaried graduates attempted to deliver lectures, they were generally unable to procure auditors, as the students, with an appreciation of coin not less acute, availed themselves of the gratuitous instruction of the salaried professors. The practice of lecturing by graduates became then seldom, and it ultimately ceased altogether. It was soon nearly forgotten; and finally, with that aggressive, oppressive policy which has always characterised the University of Glasgow, the right of graduates to lecture at all was disputed by the professors, and thus, becoming masters of the situation, they began to charge fees, retaining, like good Christians, as a matter of course, their salaries at the same time. Reverting for a little to the Papal bull of Nicholas in 1450, we find that it was given on the application of James II of Scotland, and it proceeds in the following manner:—

“We erect and establish in the city of Glasgow a general seminary (generale studium) for theology, law, arts, and any other lawful study—[finance being, no doubt, included]—
omnia alia licita facultate. We ordain that the doctors, masters, readers, and students enjoy the same privileges, liberties, honours, exemptions, and inmunities as the masters, doctors, and students of the University of Bologna, and that the Bishop of Glasgow, for the time being, be chancellor of the University, and have the same authority over the doctors, masters, and students as the rectors of the University of Bologna. We ordain, with respect to those students who have merited the license of teaching, docenti licentiam ut alios erudire vuleunt, in the faculty in which they have studied, and apply to be created masters or doctors, that they shall be presented to the chancellor, who is to take all the steps requisite for the purpose, and if they are found worthy to bestow upon them the honours sought and the licence of teaching.” And the following remarks are verbatim:—“Those who, having been examined and approved of at the University of Glasgow, shall have obtained the licence of teaching and the honours before mentioned, from that time forward, without any other examination and approbation, shall have the full and free power of governing and teaching, both in the City of Glasgow and in other universities in which they may desire to govern and to teach, notwithstanding all the statutes and customs to the contrary, although confirmed by oath, by Papal sanction, or by any other kind of confirmation whatsoever. Let no man, therefore, rashly dare to infringe what we have erected, constituted, and ordained; and whosoever shall presume to attempt it, be it known to him that he will incur the indignation of Almighty God and of the blessed apostles, Peter and Paul.” We might well commiserate the professors of Glasgow University, if the indignation of the “blessed apostles, Peter and Paul,” were not now played out; as otherwise, I opine that a good many earless professors would be found promenading the quadrangle.

This charter recognised only the chancellor and the graduates, and the function of the latter is expressly specified to be to teach in the University, and to have a voice in the management of its affairs; and this right only belonged to the graduates engaged in teaching. From this followed a division of the graduates into regent and non-regent, those only engaged in teaching being entitled to the privileges and appellation of regents. And it is upon a phrase of this charter, it may be observed, that the University of Glasgow long based its right—in quavis alia licita facultate—to grant a degree in surgery, in violation of the privileges
conferred upon, and enjoyed by, the Faculty of Physicians and Surgeons. Such was the constitution of the University until the time of James the VI of Scotland, of pious memory. The Reformation caused a centrifugal movement in the dovecots of the University, owing to the natural attachment of its professors to the Church of Rome. (Need I remind you that one of the most munificent benefactors of the University in these days is a distinguished nobleman of the Church of Rome?) James, gathering together the *membra diejecta* of the University, conferred upon it a new charter, which is known as the *Erectio Nova*. In terms of this new charter, considerable funds, derived from the rectory and vicarage of Govan, are granted to the University, and twelve persons are appointed to reside within the walls of the College or University buildings. These twelve persons are the principal, three regents, four poor students, the rector, the servant to the principal, that essential appanage to all cloisters—the cook, and the janitor. The duty of the gymnasiarcha, or principal, was defined to be to teach divinity, Hebrew, and Syriac, to preach on Sundays at Govan, and to have the general superintendence of all the members of the College. The three regents were to receive salaries for teaching; the four poor students must be really poor, and deserving of encouragement; and it is especially committed to the principal to see that the rich be not admitted instead of the poor, nor drones instead of those who might be ornaments to the country. We have changed all that. (*Nous avons changé tous cela*). It is easier for a camel to pass through the eye of a needle than for a poor man now (£2,500 is the sum required) to enter the sacred precincts of Gilmorehill; and, as for drones, the less we say about them the better. Of these charters, all that I can say of them at present is, that the University authorities regard the new one as a confirmation of the older; and it is under the former that the degrees in medicine, until comparatively recent years, and in law and theology, were conferred. The most important change introduced by the new charter was the appointment of three regents, who were to receive salaries from the funds; and the branches of study to be superintended by the regents were specified. The salaried regents, however, were not to be the only teachers, but the voluntary regents were continued in their privileges, as under the old charter; for it is expressly enacted that the students, after attending the three salaried regents, shall proceed *ad graviora studia*; and as no salaried regents were appointed to superintend the *graviora*
studia, it is apparent that they were to be superintended by
the voluntary regents, as formerly. But now the privileges
of regency began to be gradually abrogated. The members
of the University appointed four additional professors in
Arts and Theology, and the Crown furnished a full comple-
ment of professors in the other Faculties. The voluntary
regents were repelled, denuded of their ancient privileges,
and a wicked monopoly established. "Mental labour," writes
my late venerated friend and teacher, Andrew Buchanan
—clarum et venerabile nomen—"is regulated by the
principles that regulate labour of every other kind. If the
labourers are numerous, then we have the usual effects of
competition, industry, dexterity, and moderate wages. If, on
the contrary, the labourers are few in number, then we have,
as usual, carelessness, bad work, insolence, and exorbitant
demands. And these evils attain their maximum when, as
in the Scotch Universities, there is only one labourer, and can
be no more. Mental labour is, therefore, subject to the same
laws as labour of every other kind, and it is surely alike
entitled to the protection of the laws. There is surely no
more oppression in prohibiting a man from exerting his
thews and sinews in an honest calling than in prohibiting
him from exerting the powers of his mind that he may
derive an honest profit from the exercise of them. But, say
the professors, the magnitude of our classes proves to a
demonstration that we are the most capable teachers. "One
might just as well say," remarks Andrew Buchanan, "if
there were but one ferry boat between Dover and Calais, or
between Portpatrick and Donaghadee, that the excellence of
the boat was demonstrated by the number of the passengers,"
or that there is any connection between Tenterden steeple
and the Goodwin Sands. For my part, I think that the
price of oatmeal in Scotland, and the right possessed by the
Universities to confer degrees, is the main factor in the
proliferation of these hypertrophied classes.
Now, what University reformers desiderate is a restitution
of the ancient rights filched from the graduates—the surely
reasonable demand that in the profession of medicine, as in
that of law and theology, the members of the profession will
have some part, by right, in the education of the future
practitioners, and some control over their entrance into its
ranks. But there are other clamant abuses not dreamt of in
the commercially primitive days of Andrew Buchanan, and of
these, the most outstanding is the segmentation of classes and
the invention of so-called practical classes. Admitting the
eminence and capability of many of our Scotch professors, I hold they are such in spite of, and not because of, the system under which they are appointed and protected, and that they are no less distinguished in the intricacies of finance than they are in those of science. Since my own student days the number of classes contained in the curriculum has more than doubled, while the expense of study has increased about 75 per cent. In my student days we found that we had quite enough to learn in the time at our disposal, and it is surely absurd to maintain that a competent knowledge of double the number of subjects can be acquired in the same time. I say the same time advisedly, for while an additional session is about to be added to the curriculum, that session is to be devoted to hospital and other practical work. Infinitely too much work is crowded into the present medical curriculum. The idea of a student having to attend 550 lectures or demonstrations per annum, or 2,200 lectures during his entire curriculum, in addition to other work, is positively appalling. The result is, and I have some experience of medical students, that—I say it with all modesty and submission—the modern student is crammed with minutiae and details of really little practical value—with fads and visionary theories—so that during his whole course he is the victim of mental dyspepsia, and is often totally ignorant of the outstanding facts and general principles of medical science as compared with the student of thirty years ago. The remedy is to lop off these excrescences of the curriculum, which serve only to enrich the teachers and impoverish and oppress the student.

Again, this system is faulty in relation to the mode of entrance into the profession, for, no matter how immaculate professors may be—and surely they are all honourable men, with the purity desired in Caesar's wife—the modern student has the impression, be the fact as it may, that his passage through the ivory gates is facilitated by his having attended the practical classes. Is the Crown itself not suspicious of the present system, of the ability of the men over whom it throws its ægis, and of the qualifications which they give? The State virtually says "these men may be all very well for practising amongst our civilian lieges, but we doubt their ability to practise amongst our sailors and our soldiers, and we must institute a special examination before permitting them so to do." I am not at all unmindful that assessors are appointed to assist at the examinations; but these assessors are the nominees of the University, gagged and fettered by the University, and their value as intermediaries between the profession
on the one hand, and the public on the other, is a sham, a
delusion, and a snare. These and other concessions, wrung
from the University at the point of the bayonet, represent just
so much dead cargo jettisoned to enable the frail and crazy
barque to weather the storm.

There is another subject on which a commission of enquiry
has been recently sitting, and which is of primary interest to
the medical profession, and especially to its younger members.
I mean the question of hospitals. If I do not tire you, I
should like to say a few words on this matter. Since I
entered the profession the question of hospitals has interested
me; I have written a great deal upon the subject (too much,
indeed, for my benefit), and I have consequently followed this
investigation with the zest and interest of a veteran. If there
be one thing more than another which it has revealed to me,
it is the inherent selfishness and the disingenuousness of
human nature, and the potency of, possibly enough, the
unconscious personal bias. How few of us are able, are
magnanimous enough, to take a clear and dispassionate view
of a question apart from the manner in which it may touch
our pockets! The hospital system in its earliest phases was
the outcome of the best impulses of our common nature—our
too frequently frail and erring nature. It is erroneously
believed by many to be one of the first fruits of the Chris-
tian religion. This is not so. Compassion for suffering, as you
may learn from Epectetus, Buddha, Confucius, and other noble
"heathen," knows neither clime, time, religion, nor country.
But, if in the differentiation of things so eloquently depicted
by my learned colleague last week, we lose certain organs,
why should we continue to mimic or endeavour to exercise
the functions of lost and eliminated organs? If, as units of
the State, the State relieves us of certain functions, the
specialisation should be conceded, and, so far as concerns the
individual, be considered abrogated. There is a dissipation
of energy in persisting in so doing. If one organ has become
evolved so as to do the work of two, then let it do so by all
means, if it do so satisfactorily. We have it on high authority
that if two women (and surely they are difficult enough to
deal with) be grinding at a mill, one shall be taken and the
other shall be left. If I were asked in a word to characterise
the outstanding social feature of the time in which we live, I
should reply—private oppression; public munificence. Squalor
and famine, crime and prodigality, go hand in hand; virtue
and vice embrace each other. It is gravely questioned by the
foremost thinkers of the age whether, in the numerous rami-
fications of agencies which we term benevolent, we are not inflicting mischief and injustice on the better portion of mankind, thwarting and dislocating the laws of nature, and of political economy, perpetuating the diseased and the physically unfit, and engendering improvidence, sloth, and even crime, by our lavish and indiscriminating almsgiving. "Like the getting up of companies" [and most of us know what that means in Glasgow], says Herbert Spencer; "the getting up of agitations and of societies is, to a certain extent, a means of advancement. As in the United States [I beg respectfully to interpolate in the United Kingdom too], politics has become a profession into which a man enters to get an income; so here there has grown up, though happily to a smaller extent [this was written a good many years ago], a professional philanthropy pursued with a view to position, to profit, or to both. . . . Every here and there an educated man with plenty of leisure and small income, greatly impressed with some social evil to be remedied, or benefit to be achieved, makes himself the nucleus of an institution, or the spur to a movement, and, since his success depends mainly on the case he makes out, it is not to be expected that the evils to be dealt with will be faintly pictured, or that he will insist very strongly on facts adverse to his plan. . . . Unfortunately agencies established to get remedies for crying evils are apt to become agencies maintained chiefly for the benefit of those who reap incomes from them. . . . The quality of a society is lowered morally and intellectually by the artificial preservation of those who are least able to take care of themselves. . . . Removal of certain difficulties and dangers which have to be met by intelligence and activity is followed by a decreased ability to meet difficulties and dangers. . . . Fostering the good-for-nothing at the expense of the good is extreme cruelty. It is a deliberate storing up of miseries for future generations. There is no greater curse to posterity than that of bequeathing them an increasing population of imbeciles, idlers, and criminals. To aid the bad in multiplying is, in effect, the same as maliciously providing for our descendants a multitude of enemies. It may be doubted whether the maudlin philanthropy which, looking only at direct mitigations, persistently ignores indirect mischiefs, does not inflict a greater total of misery than the extremest selfishness inflicts. . . . The thoughtless giver stands but a little degree above the drunkard, who thinks only of to-day's pleasure, and ignores to-morrow's pain. . . . Calling for still stronger reprobation is that scattering of money prompted by misrepresentation of the saying
that 'Charity covers a multitude of sins.'” So says Herbert Spencer, perhaps the most brilliant and most lucid thinker of our age; and I most humbly agree with him. My point is this, following the differentiation so eloquently enunciated by Professor Watson, and conceding causa argumenti the expediency of grandmotherly legislation so far, if the State has relieved society of the humane duty of relieving the poor, and taxing the community therefor, why should private individuals interfere with the function of the State in so doing? If two agencies are at work, private and irresponsible almsgiving on the one hand and State charity on the other, is there not apt to be an overlapping, a demoralisation, and an injustice somewhere, especially as, in the matter of medical aid, you are dealing with a commodity—viz., medical skill and education, by which, on the whole, a highly educated and honourable body of men, or at least the great majority of them, are solely dependent to earn a livelihood? Now, what is the attitude of the public towards the hospital system? I venture to assert that primarily it is an entirely passive one. All the hospitals in the kingdom might be wiped out by one coup, and the public would not complain. Most people who support hospitals do so from importunity or from considerations of meretricious respectability. If a successful grocer has a penchant for a knighthood or a baronetcy, and a prefix to the name of “the leader of the opposition” in his family circle, one of his first steps is to endow an hospital, and in so doing he stands, according to Herbert Spencer, “but a degree above the drunkard.” Of course this would be a new and an abhorrent view to any respectable and Christian philanthropist. It is said that intelligent Frenchmen in London are totally incapable of understanding the munificence of Mr. Voluntary Contributions. But it may be argued that there is a class of people intermediate between the pauper and the high-wage-earning class who are totally unable to make provision for the obtaining of medicine and medical attendance during illness. Supposing, again, causa argumenti, that there is such a class, will it be seriously maintained that it requires the innumerable hospitals both in and out of the metropolis to meet the necessities of this class? I understand that some two millions of people in London receive medicine and medical attendance gratuitously per annum, and I do not doubt that the proportion is not less in this city. It is a favourite argument with a gentleman on a neighbouring height, that the number of practitioners in this city has not much increased during the past thirty years, while the population has enormously in-
creased, and he thus affords encouragement to the young practitioner. He forgets to add, that for one person treated gratuitously thirty years ago, there must be now ten who receive medicine and medical attendance on this condition. I state it with some humiliation, and as showing somewhat the reverse side of the beatific picture of my learned colleague, that any number of highly educated practitioners are willing to take and compete for medical club appointments for the paltry sum of 2s. 6d. per annum, for medicine (so-called) and medical attendance. Eliminate the class of people quite able to pay this paltry sum for this boon, and it surely must diminish the number entitled to free medical attendance and medicine apart from the State. I go further, and maintain that the individual who cannot lay aside from his earnings 2s. 6d. per annum for such a contingency as medical attendance and medicine is ipso facto a pauper, and ought not to be ashamed to be treated as such. Any man in receipt of anything over from twenty to twenty-five shillings per week, who receives medical treatment gratuitously, is thereby demoralised, and the profession is being robbed by any agency, call it what you like, that panders to him in this direction. Surely an income of even 10s. per week can afford 2s. 6d. per annum for medical attendance. Never having held a club appointment, I am free to confess that I see nothing wrong in the club system; it is the principle on which life and other assurance is based, and it is infinitely better to combine for anything than to accept gratuitously that which ought to be honourably paid for. It is at this point that the hospital and the younger and poorer practitioners come in conflict, and the hospital being the stronger, the practitioner comes off second best in the struggle. You have all heard of that Jupiter Tonans in the Strand—the Lancet—which affects to hold the destinies of the medical profession in the hollow of its hand, and "which deals damnation" throughout the land to all who do not bow the knee to its authority and to its etiquette—whose creed seems to be

"That little villains must submit to fate,
That great ones may enjoy the world in state."

Well, the Lancet not long ago made the following observations (Vide Lancet, 4th April and 2nd May, 1891):—"The great hospital which he" (Dr. Steele of Guy's, at one time superintendent of "the Royal" here) "represents has put on a petty charge for medicine to out-patients, a course which many think but little calculated to bring either hospitals or
those who administer them into greater respect. At any rate, if the people apply the principle of proportion in estimating the value of medical help, their estimate of the value of the ordinary practitioner must be lowered. They must be tempted to say—'If we can get the learning and skill of Guy's Hospital's physicians and surgeons for threepence, the value of our medical neighbour, albeit a man of education, and one who has been well tormented by the medical bodies, must be something less.' I admit the validity of this argument as a popular one, and so, doubtless, does our friend, the "medical neighbour;" and, he naturally argues, if people get the services of such men as the physicians and surgeons of "Guy's" for threepence, in order that I may get any patients at all, I must make a still lower charge. Who, then, is to blame for the penny, the threepenny, and the sixpenny dispensary system so rampant in London, and which I certainly regard as an undoubted professional humiliation? But if the value of medical services is estimated by what is paid for them, is threepenny advice not infinitely better than that for which nothing at all is paid? The fact is this, Guy's Hospital physicians and surgeons, and the physicians and surgeons of all large hospitals, give their advice for nothing or next to nothing, and thus rob junior practitioners, seeing that by so doing they are enabled to get enormous fees from the wealthier sections of the community. But is there any exclusive right so to do vested in any section of the profession? Has one man not as good a right as another to treat poor people, and thus get experience and reputation, and consequently, material advantage? To the former of these questions, my answer is an emphatic No; to the latter, an equally emphatic Yes. This, and this alone, is the raison d'être of the ever-increasing number of our hospitals and special institutions. If any one of you will take the trouble to follow the voluminous evidence taken before the Commission on the Hospital System, recently sitting in London, you will find the evidence to be exactly as any man of sense would have anticipated. Physicians and surgeons connected with large general hospitals denounce the special hospitals; the specialists naturally defend the special hospitals; and the men who hold appointments in general and in special hospitals go on the medio tutissimus ibis principle. Sir Andrew Clark and some of his confrères denounce special hospitals because they have had the good fortune to be sufficiently advertised through general hospitals and the excreta of
prominent politicians; and Sir Morell Mackenzie and his confrères defend them for a similar reason.

Coming nearer home, what is the state of matters in Glasgow? Since I entered the profession, the number of hospitals and dispensaries in Glasgow has more than doubled. The public attach, and rightly attach as I hold, importance to hospital experience. You can no more expect an accomplished physician and surgeon without experience than you can find a good tradesman without the experience which begets knowledge and manual dexterity. If it be right to treat poor people gratuitously, then one man has as good a right to do so as another. The humblest member of the medical profession has as inalienable a right to found a hospital as the University has. There is not a single medical institution in this city, with the solitary exception of the Royal Infirmary, which does not owe its existence to private medical enterprise. The Western Infirmary is the special institution of the University, and it is carefully kept as its close preserve. With that business astuteness with which the University has always been distinguished, it has secured by charter permanent appointments in the Infirmary for certain members of its staff. To enter into the details of how this has been accomplished, in certain cases, would now be unkind. Having accomplished this, the University throws the onus of maintaining the hospital on the public, who find something like £20,000 per annum therefor. Now, what do the public get in return? It is alleged that they have the appointment of two physicians and two surgeons. Well, these gentlemen—and personally I desire to speak of them with all respect—were the nominees of the University, and they hold their appointments for life. Now, I hold that permanent appointments to such an hospital as "the Western," maintained as it is by public funds, is neither more nor less than a public injustice. It is not fair to the public, for it is in the public interest that as many members of the profession as possible should have placed within their reach the opportunity of perfecting themselves in professional knowledge and accomplishments; and it is equally unfair to competent young men in the profession, with justifiable and laudable aspirations to a share in these invaluable opportunities. It is time, and more than time, that some nosocomial policeman should give the order:—"Move on, gentlemen." If there is any one thing more than another, then, to justify the creation of special hospitals in Glasgow, as elsewhere, it is this system of reprehensible and indefensible nepotism. I ask any one interested in this
question to examine the staffs of our Glasgow hospitals and other medical institutions, and he will not only find shameful, scandalous plurality of appointments, but that these appointments are all vested in about eighteen individuals, all of whom are personae gratae to the octopus on Gilmorehill.

With your kind indulgence, I would say something regarding your studies. Up to the middle of the fourteenth century, in Europe every book, including school and prayer books, and every public and private document, proclamation, bull, letter, &c., was written by the hand. The art of printing has, no doubt, on the whole, conferred an immense benefit on mankind, but in many of its modern developments it undoubtedly constitutes an embarrassment and a nuisance. If I had my way of it, I would levy a heavy national tax on so-called poetry, and have a long close time for novelists, while any rhymes which required a dictionary in order to comprehend them, or some celestially minded individual to interpret them, should be considered a criminal offence, and treated as such. Our daily morning papers contain as much reading as our fathers could mentally digest in a week, and not infrequently one paper served for several families. The art of interviewing—an abominable art—was not then discovered, and the appetite for scandal was not whetted. The same thing applies to medical literature. If a man take too much food into his stomach, his digestion is weakened, his liver cells are over-wrought and disorganised, and hypochondria, with its thousand woes, results. So it is with too much, and too varied, and too spicy mental pabulum; assimilation is weakened, and the unfortunate victim degenerates usually into a shallow empiric. I therefore adjure you to carefully select your reading; do not attempt too much; above all things, endeavour to master the outstanding facts and general principles, and then the minutiae of the details will fall into their proper place, properly concatenated and adjusted in the repertory of your knowledge. Having become masters of the great facts of physiology and chemistry, you are on the first step towards a rational system of therapeutics. Haeckel most properly observes "the immense amount of empirical facts with which the gigantic advances of modern natural science have recently made us acquainted, has led to a prevailing inclination for the special study of single phenomena and narrow domains. This causes the knowledge of other paths, and especially of nature, as a great comprehensive whole, to be, in most cases, completely neglected. Everyone with sound eyes and a microscope, together with industry and patience for study, can in our day attain to a
certain degree of celebrity by microscopic 'discoveries,' without, however, deserving the name of a naturalist. This name is deserved only by him who not merely strives to know the individual phenomena, but who seeks to discover their casual connection." A simple fact is really of little value unless you know and appreciate its correlation to other facts and general principles.

Such of you as have had any experience of large cities, and especially abroad, are aware, that to master the topography of such city, you mentally map out the prominent buildings and principal thoroughfares. Knowing where these are, you know where to find localities and buildings circumscribed by these boundaries. If you are told that the Quartier Latin, so dear to the medical acolyte, is between the Panthéon and La Salpêtrière, you are not likely, if you know these buildings, to be gadding about for it at Montmartre, or the Champs Elysée. So it is in science. Having mastered outstanding general principles, you know where to search for, and are likely to obtain, new facts. You will do well—it is nigh impossible in those days—to distinguish between vital or useful, and trifling or irrelevant details, between ephemeral theories and such as rest on the solid foundation of eternal truth. I remember, when I was a student, how lectures were uselessly and unprofitably spun out; the notion of the iniquitous device of multiplying classes was just incubating. Calisaya bark, for instance, and its derivatives are doubtless of immense value in medicine, but what on earth is the use of dilating on the geological features of the country in which the tree grows, whether it is taken to the coast by white or black men, Spaniards or Indians, and whether on the backs of mules, horses, or asses? The subject which I have the honour to attempt to teach to you is full of details. It ramifies into all the sciences; so as the years of man's life are but three score and ten, and as much has to be accomplished in the too fleeting time, we should husband this time with miser care. Since I was a student, the subject of physiology has been invaded largely by natural philosophy and the science of mechanics. An immense amount of ingenuity has been lavished on the description and perfection of delicate instruments in relation to physiological investigations and study. I humbly think that too much time is thus spent. Physiology should be taught to the medical student in its relations to the future exercise of his art. In many cases, at least, it should be sufficient for a student to know that certain results have been obtained, leaving him, if time and opportunity after-
wards so incline him, to master the details of the manner in which these results have been reached.

Against three classes of authors I would especially warn you. Firstly, the inventor of new surgical, or medical, for that matter of it, devices. It is a trite axiom that a bad workman never gets a good tool. New instruments are, as a rule, invented as a means of genteel advertising. Not long ago there was an amusing fight in our leading medical journals over obstetric bags (the obstetric art lends itself readily to strife). In the course of my duties in connection with a metropolitan medical journal, I ventured to term this fight "the battle of the bags," and as such it has been pretty well known since. I advised an ambitious obstetric friend of mine in this enterprising city to add a toothpick to one of the bags, and enter the arena of conflict! As the result of my experience, I would also advise you to eschew the writings of the man—often a fashionable and successful practitioner, as the phrase goes—who takes his knowledge of drugs from the advertising columns of our medical journals, and the polite gentlemen who periodically call upon us from manufacturing druggists, and who, without the slightest notion of offence, dictate what and how we are to prescribe. This gentleman is sure to be constantly ringing the changes on all the newest sesquipedalian drugs of American and Teutonic birth. Polypharmacy and insensate rushing after new drugs are eminently characteristic of the superficial charlatan. *Hic niger est; hunc tu, Romane, caveto.*

In an especial manner, next to pestilence and to famine, would I guard you against the "discoverer." Let me tell you solemnly that most things that are new are not true; and that most things that are true are not new. Every now and then we are vexed by new "cures" and visionary systems, which have their day and cease to be. So that the remark of Bacon is a just one, "that the course of medicine is circular rather than progressive." But the other day, what a commotion we had in our midst! The darling sons of science—the new lights to whom an admiring public looked with faith and with hope—were on the stampede to Berlin. "A Berlin! a Berlin!" resounded from Camlachie to Whiteinch. What I ventured to term *Kochspiel* came upon

* In one recent number of a leading Vienna medical journal the following new remedies (?) are raked together:—Cocainum hydroiodicum, ætheleum bromatum, ammonium embellicum pulv., methylblue, apocodineum hydrochloricum, aurum tribesatum, benzanilid, citrarium puriss., chloral-ammonium, ephedrin pseudo-hydrochloricum, and a new spirit of bryony!!

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us with the suddenness and the brilliancy of the *Borealis race*, and it has vanished like the frost-work of an autumnal morning, leaving not a wrack behind, save possibly a lingering memory of public folly, medical credulity, and despicable commercial enterprise.* I entered the profession when the greatest surgical fetish of the nineteenth century was in swaddling bands. I have watched with mingled admiration and astonishment the pirouetting of Sir Joseph Lister among our old friends the antiseptics. The antiseptic system, like the Sheriff of Perth, in a sense never dies, for it is never, and has never been, the same thing since I knew it for a single week. It is like Lady Macbeth’s dagger—“I see thee not, and yet I have thee still.” I have seen Sir Joseph Lister embrace one antiseptic after another, as at length, *par excellence*, the surgical saviour; and I predicted, what has happened, that if Sir Joseph went on at that rate, that we would soon be back to where we were nearly thirty years ago—viz., at our ancient aids, the antiseptics, minus the exploded Listerian doctrine. “I want a hero—an uncommon want; for every day brings forth a new one.” In Lister’s last deliverance, in what is called the Cameron Lecture (the “Cameronian Rant,” I venture to call it), if language means anything, Lister has abandoned the spores and bacilli, and the antiseptic system is now back to the dirt from which it sprung. Lister to-day is being praised for his honesty, while intelligent men of science have been ridiculing him for his folly during the past thirty years.

“In science, too, how many a system raised,
Like Neva’s icy domes, awhile has blazed
With lights of fancy and with forms of pride,
Then, melting, mingled with the oblivious tide.”

Gentlemen, beware of the “discoverer.”

Gentlemen, most of you are on the threshold of your professional life, at the gateway of a profession, than which there is none more contemptible in the hands of a man capable of prostituting it; none more honourable under the broad canopy of heaven in the hands of a man under the influences of truth, dignity, and honour. It is followed, like every other calling, as a means for earning an honest livelihood, let me hope, in most cases. If you desire to reap fortune or State honours, then you should hesitate; you should reconsider your resolve. As a rule, however, the modest

* “£16 an ounce for spilt glycerine, which only caused blood-poisoning, could not be defended on the grounds that the vendor was a scientist whose sole aim was medical progress.”—Med. Press, 4th November, 1891.
want of every day the toil of every day will supply. But if you are worthy of it, you will reap what position cannot attain to, nor the wealth of a Cæsæus command—

"The consciousness of good, which neither gold,
Nor sordid fame, nor hope of heavenly bliss
Can purchase."

I adjure you, be not discouraged by failure. "Every failure," says Whewell, "is a step to success." Like the phœnix from its ashes, the spider constructs from the wreck of his tenement his new gossamer web. The repeated failures of the little ant stimulate him to renewed efforts in the gathering of his frugal store, not careless to provide for future want. The discovery of what is false and what is disappointing should lead you to seek the more earnestly after what is true and encouraging. By failure, the builders on the plains of Shinar found the earth to be their inheritance.

"Standing on what too long we bore,
With shoulders bent and downcast eyes,
We may discern—unseen before—
A path to higher destinies.

"Nor deem the irrevocable past
As wholly wasted, wholly vain,
If, rising on its wrecks at last,
To something noble we attain."

Gentlemen, it will be yours to deal with man in his physical and mental infirmity. When the twilight is past, and the shades of eternal night hover around—

"Tis thine to soothe when hope itself has fled;
And cheer, with angel smile, the sufferer's bed."

Before heartrending appeals for your aid against the inexorable tyrant, Death, you will realise the finiteness of your highest conceptions—the impotency of your holiest endeavours—and humble yourselves in the presence of Him "who fastened the foundations of the earth, who spread His light upon it, and balanced the clouds in the air; who binds the sweet influence of the Pleiades and guides Arcturus with his sons; who gave to the horse his strength, and goodly wings unto the peacock; and who is king over all the children of pride." Be this your golden rule in life, and you cannot err:—"Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, think on these things."
A CASE OF MULTIPLE SARCOMA OF BONE.

(With Lithographic Plates.)

By JOSEPH COATS, M.D.

(Shown in the Pathological and Clinical Society of Glasgow, 2nd November, 1891.)

The case here recorded is a very unusual one, and opens up some general questions as to the origin of tumours. Primary tumours of bone are generally regarded as originating in the periosteum or the bone-marrow. There seems little doubt that in the present case the tumours altogether have a purely medullary origin, so that they belong to the group of myelogenous tumours. The following is an account of the history and post-mortem appearances:

A. L., aged 43, engineer, was admitted to Ward XIV in the Western Infirmary, on 28th September, 1891, suffering from various swellings, pains in back and legs, and a large sore on the back. He had been a few days in Ward XI, to which he was sent at first by mistake.

Over the sternum was found a large tumour about 6 inches across, displacing the trachea slightly to the right side. This first appeared about five years ago, and has never given him any pain or trouble. Another tumour was found over the right clavicle, a third in the right humerus, and a fourth in the left hip.

He had been at work up till May, but then, owing to the onset of pain in the back and down both legs, he had to stop work. Soon he was unable to walk or even to stand, having lost the power of his legs. Still he has always been able when lying to move his legs.

Patient was first admitted to Ward XI on 25th September, and as he was being helped into bed his right humerus was fractured, no violence being used. Patient also stated that a few days before admission, whilst sitting on a rather too narrow night stool, his left foot slipped, he heard a crack, and felt intense pain in his left thigh. There is now a great swelling over this thigh, but no distinct signs of fracture or dislocation.

The patient was very helpless in bed, and even before admission the back had begun to give way, and a sloughing
bedsore the size of the palm of the hand formed. He gradually became weaker, and for about forty-eight hours before death complained of difficulty of breathing. He died on 4th October.

Post-mortem Examination, 36 hours after death.—The body is well nourished. Over the upper part of the chest there is a prominence of a generally rounded form, measuring 3\frac{1}{2} inches from above downwards and 4\frac{1}{2} inches laterally, and with a projection of about 1\frac{1}{2} inch. Its upper border corresponds with the upper border of the sternum. The tumour occupies the middle line, but is more extensive to the left than to the right in the proportion of about two-thirds to one-third. At the lower border of the main mass other prominences are felt, chiefly about the left border of the sternum.

The skin having been reflected, the sternum, with the attached costal cartilages and a portion of the osseous ribs, was removed, and it was then seen that the whole of the sternum was replaced by tumour tissue (see Fig 1.) The bulky portion of the tumour represents the manubrium, and it projects inwards considerably more than outwards, a section in the middle line giving a measurement of 2\frac{1}{2} inches in thickness by 3\frac{1}{2} inches from above downwards. The first rib emerges from this mass, being partly expanded into tumour, and the head of the clavicle on each side is also expanded by tumour.

The altered manubrium is somewhat loosely attached to the rest of the sternum, so that the two can be freely moved on one another. This portion, representing the body of the sternum, is expanded to a much less extent than the manubrium, its greatest thickness being 1\frac{1}{2} inch. Only the tip of the ensiform remains unoccupied by tumour tissue. In both manubrium and rest of sternum the tumour tissue is a soft, pale-brownish structure, which on section shows a partial division into large lobules. The tissue is completely bounded by a fibrous capsule, in which small spicules of bone are occasionally present, but these are scarcely at all met with in the manubrial portion. There are no spicules in the substance of the tumour.

In addition to the involvement of the first rib already mentioned, the second rib on the left side is involved at its connection with the sternum, and expanded by tumour tissue. The remaining ribs on either side down to the fifth are loose at their sternal ends, from the sternum at their junction being composed of soft tissue. In addition, a number
of ribs present in their continuity spindle-shaped swellings composed of soft tissue, so that the bone is discontinuous in these places.

The vertebral column was removed and sawn longitudinally. It then appeared that the whole of the vertebrae, with the exception of one or two at the upper and one or two at the lower extremity, have their bodies almost entirely replaced by tumour tissue, so that almost no spongy substance is left, and the intervertebral cartilages stand out between light-brown masses, which are almost deliquescent. The substance of the spinous processes is also in some cases partly replaced by tumour tissue, this being visible in longitudinal section in nine places, but there is no such complete replacement as in the bodies.

The right humerus, about 3 inches from the upper extremity, presents a gap filled mostly with brown diffusent matter; the edges of the gap are composed of jagged bone, frequently in the form of separate scales. There is little tumour tissue remaining in the gap, but in the medullary cavity of the bone, some distance beneath, the bone-marrow is found replaced by tumour tissue. A considerable quantity of dirty brownish pus is present around this lesion, partly infiltrating the tissues.

The left femur presents, near its upper end, a similar lesion also with brown pus around it.

In the pus from both these lesions staphylococci were found abundantly as well as pus corpuscles, and cultures gave distinct growths of the staphylococcus pyogenes aureus and albus.

The remaining organs of the body presented scarcely any pathological condition. There was a trace of fibrin on both pleural surfaces, but no lesion in the lungs beyond cœdema. The heart was rather large and flabby, weighing 13½ oz. The spleen was enlarged, weighing 9¼ oz. The kidneys weighed 6½ oz. and 6 oz. respectively. The liver weighed 73 oz., and although pale, was not appreciably pathological.

Microscopic examination of the tumours in bone showed them to be composed of an almost homogeneous mass of round or polygonal cells about 3000 inch diameter, and possessed of oval nuclei rather more than half the diameter of the cells (see Fig. 2). In a section of one of the tumours in a rib, after decalcification, spicules of bone were found towards the periphery (see Fig 3). The bone corpuscles were well preserved, and showed no signs of activity, but the tumour tissue was seen impinging upon the bone, and in some cases
penetrating into Haversian canals, where it could be seen alongside and surrounding the vessels (Fig. 4).

**Remarks.**—From the record of the *post-mortem* appearances recorded above, it is clear that we have here a form of malignant tumour having a special affinity for the bone-marrow, growing in it and destroying the proper tela ossea. Almost the whole of the sternum is replaced by tumour-tissue, and the same applies to the bodies of most of the vertebrae. There were also tumours in the bone-marrow of one femur and one humerus, and in a number of ribs.

The largest and probably the oldest tumour is that in the sternum, but no probable estimate can be formed of the age of those in the vertebrae. These were presumably the occasion of the pain in the back which was, during life, one of the most prominent symptoms.

Looking at the case as a whole the question occurs, Is this a case of primary tumour in the sternum with many secondary new formations? There are many serious objections to accepting this view. The selection of the osseous system, without any appearance of tumours elsewhere, certainly suggests a distinct proclivity to the bones, such as one finds occasionally in cancers, but much less frequently in sarcomas. To my mind the condition of the vertebrae almost precludes the idea of secondary tumours in the ordinary sense. Secondary tumours arise by the implantation of grafts from the primary one. It is difficult to conceive that such grafts should be planted in the cancellated tissue of the bodies in this regular fashion. The appearances are much more suggestive of a condition having an independent origin, and described rather as the expression of a general tendency in the osseous system as a whole, manifested in certain parts of it on account of local peculiarities. The regular involvement of the vertebrae, and the frequent occurrence in the ribs suggests that possibly mechanical pressure and injury may have had to do with the origin of the individual tumours.

Such were the ideas suggested by this case at the time of the *post-mortem* examination. In considering it, I remembered another case, which had always to my mind suggested the idea of a congenital tendency in the bone-marrow to the formation of tumour tissue. As the case is in itself of some interest, and the specimens are preserved in the museum of the Western Infirmary, I may here quote the account which I wrote for the catalogue of that museum:—
29. Sarcoma of the Humerus: Almost Complete Destruction of the Bone.—The preparation shows the half of the arm, and it is seen that the humerus is replaced by a large pyriform tumour, thickest above, the only part of the bone left being the condyles. The tissue of the tumour is soft, and here and there spicule of bone occur, but there is no indication of the outline of the humerus which has completely disappeared. In the midst of the tumour, and at the upper part, there is an irregular cavity, probably due to softening of the oldest part of the tumour. Under the microscope abundant round and spindle-shaped cells are found, with frequent fatty degeneration.

30. Sarcoma of Humerus.—This is the other arm, shown in section from the same case as No. 29, and it presents almost identical characters.

These two preparations were removed from a young lady by Sir George Macleod. During life the first indication of disease was a fracture occurring on a trivial injury while dancing, the patient being then a healthy-looking young lady. This occurred about 18 months before death, and it was many weeks before the swelling of the arm became manifest, the only abnormal circumstance being that the bone would not unite. Subsequently the other arm underwent a spontaneous fracture and became affected in a similar way. The arm shown in No. 29 was amputated at the shoulder, and a good recovery took place. The other arm was removed some months afterwards at her own urgent request, and she sank rapidly after that operation.

This case, exhibiting a symmetrical tumour-formation in the bone-marrow of the humerus, and a tumour-formation which involved ultimately the whole length of both bones, struck me as indicating a peculiar tendency to such tumour-formation in the bone-marrow.

On looking into the literature of the subject one finds a good many cases of multiple sarcoma limited to the osseous system. There is also the further fact having a bearing on the subject that some of these cases have been associated with general conditions of the osseous system, especially Paget's osteitis deformans, mollities ossium, and pernicious anaemia.

In Paget's Osteitis Deformans, we have the bones enlarged in outline bent and deformed. There is coincidently an opening out of the bone, a rarefying ostitis, and the enlarged spaces are filled out, as in inflammation, with a tissue which is abundantly cellular. It is curious that in this disease, which certainly shows a marked proliferation of the bone-
marrow, we have often tumour-formation, and the tumours are usually sarcomatous, although other forms have been found, and even cancerous tumours. In this connection, the opinion of Butlin is of much value, where he says:—"Indeed, many, if not most, of the recorded cases have died of sarcomatous disease."*

In a very complete and suggestive paper by Von Recklinghausen, lately published, † a number of cases of ostitis, in its various forms, especially deforming and fibrous, are related, and, in both these, tumour-formation is of occasional occurrence, as if inflammatory changes in the bone-marrow were apt to be associated with the formation of tumours.

Osteomalacia, or mollities ossium, is also a disease in which there is enlargement of the medullary spaces at the expense of the true bony tissue. In some cases, at least, the enlarged spaces are occupied by a cellular tissue, as if an inflammatory process had occurred in the bone-marrow. In a case recorded by Butlin, ‡ there was a general softening of the bones, an osteomalacia, in which the bone-marrow generally was replaced by a red substance, consisting mainly of round cells, like leucocytes, mingled with fat cells, or else of a tissue composed of spindle and giant cells, such as are found in myeloid tumours. The femur had undergone fracture on account of this condition of the bone. With this general condition of the osseous system was associated the existence of two tumours in the lower jaw, both of them of central origin. These tumours were myeloid sarcomas, consisting of tissue similar to that in some of the softened bones.

Grawitz has recorded two cases of pernicious anæmia, § in which, along with general changes in the bone-marrow, there were numerous tumours originating in the bone-marrow. In one of the cases the alteration in the bone-marrow consisted in a transformation into a tissue composed of small round cells, a lymphatic tissue, and the tumour presented a similar structure. † In the other case, the change in the bone-marrow consisted in a replacement of its tissue with large single-nucleated round cells, whilst the tumours consisted of small round cells along with spindle-cells in small number.

Amongst other cases having a bearing on this subject, may

*Butlin's Sarcoma and Carcinoma. 1882.
‡Path. Trans., xxxi, 277. 1880.
§Grawitz, Virchow's Archiv., 76, p. 353. 1879.
be mentioned one recorded by Dr. Hermann Weber, * in which there was, as in my case, a great enlargement of the sternum with replacement of its tissue by a soft cellular tissue, along with similar changes in many of the ribs, skull, pelvis, and vertebrae. This case is recorded as one of mollities ossium, probably of cancerous origin. Considering the date of this paper, we may read sarcomatous instead of cancerous. There is, further, a case by Dr. John Abercrombie, † in which multiple sarcomata existed in the cranial bones, the ribs, and sternum. In this case, however, it is doubtful, according to the opinion of a committee of the Pathological Society, whether the tumours of the skull originated inside the bone or in the periosteum and dura mater.

From these multiplied instances, we may infer that tumours of the bones may take origin in the bone-marrow from various forms of stimulation of that tissue. We may even suppose a congenital tendency to tumour-formation in the bone-marrow, which may sometimes manifest itself in a general tumour-formation. The resulting tumours all belong to the group of sarcomas, but they may have somewhat varying structures. Some consist of small round cells, and have been grouped as lympho-sarcomas (one of Grawitz's cases); some contain giant cells, and have been called myeloid sarcomas; some consist of round cells of smaller or larger size, and are designated round-cell sarcomas. It may be remarked that similar differences in the structure of the bone-marrow are met with in cases of pernicious anaemia and leukæmia; that is to say, there may be a transformation of the bone-marrow into lymphoid tissue, into tissue composed of large round cells, or into tissue containing giant cells. This last condition is, no doubt, uncommon, but was lately pointed out to me in a case of leukæmia, by my assistant, Dr. R. M. Buchanan.

EXPLANATION OF PLATES.

Fig. 1.—General view from behind of tumour of sternum.

Fig. 2.—Isolated cells of sternal tumour. × 400.

Fig. 3.—Section of tumour in rib showing small spicules of bone near periphery. × 8.

Fig. 4.—From same section as Fig. 3. The tumour tissue impinging on bone and penetrating Haversian canal. × 300.

* Path. Trans., xviii, 206. 1887.
† Path. Trans., xxxi, 216. 1880.
A CASE OF PUNCTURED WOUND OF THE RIGHT
AURICLE OF THE HEART—SURVIVAL FOR NINE
DAYS.

BY JOSEPH COATS, M.D.

(Shown at the Pathological and Clinical Society, 9th November, 1891.)

It is so unusual for a wound of the heart to be survived for
any length of time that this case seems to me to deserve
special record. The little patient was under the care of
Professor George Buchanan, and the history of the case as
given in the ward journal is as follows:—

Jane W. W., aged 10, was brought to the Infirmary at
6:50 p.m., on 30th May, 1891, suffering from a wound in the
chest.

She was playing with some other children, and in jumping
from the top of an iron railing she fell on to the point of the
railing, and one of the spikes penetrated her chest on the
the right side, about the level of the fourth rib at its junction
with the cartilage. On admission she was suffering from
shock, the pulse being almost imperceptible at the wrist, face
pale, and lips with a bluish tinge. Slight vomiting occurred,
and the vomited matter seemed to contain a small quantity of
blood. Some difficulty in respiration existed. Patient's clothes
and the dressings which had been applied were soaked with
blood. On examination of the seat of injury, a wound three
quarters of an inch long was found at the point before
mentioned. Percussion note over that side of the chest was
clear and the vesicular murmur could be heard. There was
extreme emphysema of the cellular tissue of the chest wall.
The wound was dressed with green silk, alembroth gauze and
gamgee, with slight pressure. Warmth was applied to the
body, and 30 minims of brandy were given every half hour
till the pulse improved.

The patient recovered from the shock and appeared to be
doing well for eight days, when the following note was made:—

7th June. — This forenoon recurrence of pain and dyspnœa
took place. Patient became restless, raving and delirious.
She looked pallid, pinched, and haggard, markedly in contrast
to her condition yesterday morning. Pulse 120, weak. Tem-
perature 102.2°. Whisky, ½ dr. every half hour. Further
examination owing to her restless state was rendered impos-
sible. Professor Buchanan saw the case about five this afternoon, and ordered 5 grains of antipyrin should the temperature continue to rise.

8th June.—Towards early morning she was noticed to be becoming distinctly worse, sleeping only by snatches. At 2 A.M. there was great restlessness and delirium, vomiting, incessant thirst; pulse 140, very feeble; breathing short and painful; respirations 68. There was no lividity, but marked pallor. She had the aspect of one suffering from the effects of the loss of a large amount of blood. Whisky, 1 dr. every quarter of an hour. Ice to suck. Patient gradually sank, and died at 4 A.M.

Post-mortem examination thirty hours after death.—There is an oval aperture in the skin about five-eighths of an inch in long diameter and three-eighths of an inch in short diameter, situated 1½ inch below and three-fourths of an inch inside the right nipple, these figures indicating the middle of the wound. The aperture is right through the skin, the wound gaping and showing a partial undermining. In connection with the wound the cartilage of the fourth rib is fractured right across at a distance of three-fourths of an inch from its sternal attachment. On opening the chest the anterior edge of the right lung is found adherent to the pleura, covering the posterior aspect of the sternum on the one hand and the sac of the pericardium on the other. These connections are by soft fibrin, which is in considerable quantity here. Although the lung projects beyond the wound, and a portion of it lies directly in its track, yet, after the most careful examination, no puncture of the lung is found.

The parietal pericardium at a point corresponding with the wound in the chest presents an elongated wound about three-fourths of an inch in length by less than a fourth of an inch in breadth. This aperture is entirely closed by fibrin both externally and internally.

Opposite the wound in the pericardium the right auricle presents a wound of similar size, also closed by fibrin, except at its upper extremity, where there is an aperture sufficient to admit the point of a small probe. The wound is situated about midway between the orifices of the venae cavae, and somewhat below their level. It has a general longitudinal direction in a line from the base of the ventricle to the superior cava. Viewed internally this wound is represented chiefly by a layer of warty vegetations, which are prominent, and resemble those in malignant endocarditis.
The pericardium contained a very large quantity of blood-coloured fluid, which, especially in the lower part, was muddy and almost purulent. In this fluid abundant streptococci were found. The surface of the sac generally was covered with a layer of fibrin which, in some places, attained considerable thickness.

The right lung, besides the fibrinous exudation on the pleura already mentioned, presented in its posterior parts an exudation partly hæmorrhagic, but mainly fibrinous. In the lung itself there was some hæmorrhage around the bronchi. The left lung was normal. The spleen was slightly enlarged, weighing 2½ oz. The remaining abdominal organs were normal.

There may be some difference of opinion as to the exact course of events in this case, and differences of opinion were expressed at the meeting where the specimen was shown (see report of the meeting in this Journal). The following may be taken as approximately a narration of the conditions existing:—

The spike of the railing entered the chest opposite the cartilage of the fourth rib, which it fractured. Although it transfixed the pleura, wounding it at the points of entrance and exit, and although the anterior part of the lung overlapped these parts, yet the lung was not transfixed or even wounded. It may have happened that the accident occurred during expiration when the anterior edge of the lung was retracted, or else the blunt implement, carrying the yielding cartilaginous ribs along with it as it entered the chest, may have pushed aside the movable anterior part of the lung.

Having transfixed the pleural sac, the spike entered the pericardium opposite the right auricle, which it also wounded. It will be noticed that the wound in the pericardium, and that in the auricle, were about the same size—namely, three-quarters of an inch in length. The wound was made by a somewhat blunt instrument, and was no doubt ragged. It was also made in a muscular wall. Notwithstanding these facts, however, it seems strange that there should not have been, on the withdrawal of the article, such a gush of blood as to fill the pericardium and destroy the life of the patient. The ragged wound must have got valved in some way, and soon partially united by fibrine.

I think we may suppose that some, and perhaps a consider-
able escape of blood occurred into the pericardium at this time, but yet the patient survived.

On this supervened a septic phase in the case. The spike introduced the usual microbes, and these set to work, producing the usual phenomena of septic inflammation. The post-mortem shows that there was a septic pleurisy gluing the anterior parts of the lung to the chest wall, and also causing a fibrinous exudation in the posterior parts. There was a septic pericarditis, evidenced by a fibrinous exudation, covering the surface, and in some places attaining to considerable thickness. The fluid in the pericardium was also muddy in the lower parts and almost purulent. The wound in the heart itself showed internally an appearance which, to my mind, at once suggested ulcerative endocarditis, this being also in its causation septic. The septic character of these phenomena was evidenced by the presence in the pericardial exudation of abundant streptococci.

The immediate cause of death here is to be related to the distension of the pericardium. It is noted in the post-mortem record that "the pericardium contained a large quantity of blood-coloured fluid." Taking this along with the wound in the auricle, I confess that, at the time of the post-mortem, I thought that the bloody fluid was mainly blood which had escaped from the auricle and had caused death by its accumulation in the sac. This view is strongly supported by the history of the case given above. It was noted before death, in the words given in italics, that "she had the aspect of one suffering from the effects of the loss of a large amount of blood." My view was that after the wound in the auricle had closed, shortly after its infliction, septic processes had ensued and had reopened the wound to the extent present at the time of death, and that this had been followed by the fatal accumulation of blood in the pericardium. I confess, however, that another view, suggested at the meeting of the Society (See Report) is possible. The fluid in the pericardium may have been largely an exudation, the result of the septic pericarditis. In any case, the septic process, which was evidenced during life by the elevation of temperature, had directly or indirectly to do with the fatal issue.
CURRENT TOPICS.

UNIVERSITY COURT—ELECTION OF ASSESSORS.—By a small but quite decided majority, the Rev. Mr. King and Dr. D. C. M'Vail were elected Council Assessors to the University Court. No one will grudge the two gentlemen their victory; and all will admit that they have worked well for it.

PATHOLOGICAL AND CLINICAL SOCIETY.—The Society will meet in the Faculty Hall, 242 St. Vincent Street, on Monday, the 14th inst. The following specimens will be shown by Dr. Coats and Dr. Rutherford, introductory to a Discussion on Acute Intestinal Obstruction and its treatment:—Strangulation by a band (three cases), strangulation by an aperture in the mesentery, intussusception, stricture of bowel following strangulated hernia, multiple adhesions following strangulated hernia, cancerous stricture of sigmoid in the child; with a summary of other cases of acute obstruction ending fatally.

GLASGOW OBSTETRICAL AND GYNECOLOGICAL SOCIETY.—The first meeting of the Glasgow Obstetrical and Gyneceological Society in this session was held on 22nd October—Dr. Park, President, in the chair. The following office-bearers were elected:—Hon. President, Sir Spencer Wells, Bart.; President, G. Halket, M.D.; Vice-Presidents, Robt. Pollok, M.D., and G. A. Turner M.D.; Treasurer, Alex. Miller, L.R.C.P.E.; Secretary, J. Nigel Stark, M.B.; Reporting Secretary, Robt. Jardine, M.D.; Pathologist, A. Milroy, M.D.; Council, T. Richmond, L.R.C.P.E., Robert Kirk, M.D., H. St. Clair Gray, M.D., E. H. L. Oliphant, M.D., J. Carlyle, M.D., and M. Black, M.D. The retiring President gave a short address. Dr. Richmond of Paisley showed an encephaloid monster which had been born at full time. Dr. H. St. Clair Gray showed the uterus and kidneys from a case of eclampsia.

ANDERSON’S COLLEGE MEDICAL SCHOOL.—At a meeting of the Governors, held on 23rd November last, within the office of the Secretary, Mr. John Kidston, Dr. Geo. Bell Todd was appointed Professor of Zoology; Dr. Freeland Fergus was appointed Professor of Physics; and Dr. John Carswell, Certifying Physician in Lunacy to the Barony Parish, was appointed Lecturer on Mental Diseases.
"The Journal of Pathology."—Under the direction of Dr. G. Sims Woodhead, it is proposed to publish a *Journal of Pathology*. There is great need for such a journal in Great Britain, and we heartily wish the venture success.

**Klebs on the Composition of Tuberculin.**—In the *Deutsche Medicinische Wochenschrift* for November, 1891, there appears a paper by Professor E. Klebs, of Zurich, entitled "The Composition of Tuberculin" (*Die Zusammensetzung des Tuberculin*), in which the Professor states that he has already laid before the Congress für Innere Medécin facts which show that tuberculin not only causes in animals the disappearance of the tubercular tissue, and brings about a complete restitution of the parts infected with tubercle, but also that the disagreeable symptoms which are observed in man are brought about by special substances which have nothing to do with its medicinal properties, and can be removed from the tuberculin without reducing its efficiency. Further investigations in the same line have so convinced him of the truth of this that he finds himself forced into the peculiar position of being the defender of tuberculin against its discoverer.

Klebs objects to Koch's method of testing the substances obtained from the crude tuberculin by its deadly effect on tubercular guinea pigs. He considers that this only shows the presence of deleterious substances which have not necessarily any connection with the medicinal properties of the tuberculin. He thinks that the good results obtained in animals by the treatment with tuberculin are due to the fact that these animals possess, from their constitution, an immunity against these deleterious substances, so that to them a sufficient quantity of crude tuberculin can be given to produce its medicinal effect, while in the case of man, not possessing this immunity, its evil effects gain the upper hand. The fact that these animals have not an immunity also against the active healing principle goes to show that this must be a different substance from the injurious one. If, then, we have to do with two or more chemical substances, it ought to be possible to separate these from one another. The Professor finds that these injurious substances are organic bases (alkaloids). By purifying the tuberculin, which had been thrown down by absolute alcohol with chloroform and benzol, so that only a very slight alkaloid reaction remained, he prepares a lymph to which he has given the name of "tuberculinum depuratum;" with this lymph he has been able perfectly to cure animals
which had been affected with tubercle, and it destroyed the tubercular tissue and brought about the disappearance of the bacillus.

Professor Klebs maintained that if Koch be right in his opinion that tuberculin has no destructive property against the tubercular bacillus itself, very little is to be hoped for from its curative power; and he thinks that its action in causing necrosis of the tuberculous tissue is injurious, for he will show, in a book which he is shortly to publish, that every necrosis of tubercular tissue brings with it an increase in number of the tubercle bacilli. He demonstrated this important fact to Koch and many of his colleagues last Easter.

After going more carefully into his method of preparation, the Professor goes on to say that the substance obtained is entirely harmless, does not cause any febrile symptoms, and in a very short time brings about a marked improvement in tubercular patients. The hectic fever and the night sweats disappear, the appetite and the body weight improves, while the cough and expectoration rapidly grow less. The bacilli in the sputum become granular, gradually less and less easily stained, and at length they entirely disappear. In thirty cases treated there has not been, so far, a single unpleasant symptom. Of course, there is not yet time to give positive results. He has placed some of the substance in the hands of Dr. Karl Spengler, of Davos, and Dr. Nolda, of Montreux, in order that they may make further investigation as to its medicinal value.

The position for us is now to await the result of the controversy between two such able German professors as Robert Koch and E. Klebs. We are, however, inclined to believe that the latter will have great difficulty in maintaining his defence of tuberculin against an opponent who has evidently so thoroughly studied its properties, and has not come to his conclusions without the most careful consideration.

The evidence for the destruction of the bacillus itself by the action of tuberculin is as yet, in our opinion, very feeble; and after having examined large numbers of preparations of sputum, &c., we are inclined to lay very little weight on the fact that the bacilli present in a specimen are only coloured with difficulty, as it is well known that old tubercular lesions prove often very virulent, while no bacilli can be found in them by means of staining.

The mere fact of improvement taking place in a few cases does not, in our opinion, prove anything, as there is no disease more liable than tubercle to irregularities in its course.
We hope that the discussion of the subject will lead to further investigations, and that at length some means may be found to reduce the mortality from this most terrible disease.—C. W.

The Anti-Vivisectors and the British Institute of Preventive Medicine.—The Victoria Street and International Society for the Protection of Animals from Vivisection, having failed in their efforts to prevent the incorporation of the Institute, now memorialise the Home Secretary to refuse a vivisection licence "next year and in all future years." The memorial has 46,315 signatures, among whom are 50 medical men. Among these 50 medical men we do not observe any of the first rank. The names include those of 26 peers, 20 peeresses, and 14 bishops, but we entirely fail to see how these august names add any weight to the memorial. We do not think that there is the slightest chance of the licence being refused, and we could wish that the memorialists would expend their energy in a better and nobler cause.

REVIEWs.


Dr. Obersteiner's work occupies a very high place in German literature, and the profession is indebted to Dr. Hill for the admirable translation which he has made of it. It is seldom that a German work is presented to English readers so free from German idioms and modes of expression.

The anatomy of the nervous system has, within recent years, made much progress, although much still remains to be elucidated. The complexity of structure of the nervous tissues, and the necessity for various special modes of preparation in their examination, readily account for the somewhat backward state of our knowledge of these organs. In this volume, Dr. Obersteiner has given us a guide to the examination of the central nervous organs, and, at the same time, a
very minute and detailed description of their structure, so far as it is at present known.

The first section deals with methods, and describes how to harden, cut, and stain sections, as well as other methods of examination, such as the comparative anatomy method and by physiological experiments. Obersteiner prefers hardening in chronic acid or bichromate solutions, rightly pointing out that long maceration in alcohol destroys certain details of structure. Weigert's and other methods of staining are fully detailed.

Section II treats of the morphology of the central nervous system, and is practically confined to the macroscopic appearances, the external appearance, the various parts and their relations, the convolutions and sulci, &c., as well as the general appearances presented by sections at various levels.

Section III discusses the histological elements of the central nervous system, and deals exhaustively with nerve-fibres and nerve-cells, as well as the vessels, epithelia, and connective tissues entering into the structures.

Section IV is concerned with the minute structure of the spinal cord, that being the simplest part of the great nervous system.

Section V is devoted to the topographical examination of the brain, and the method adopted is the description of numerous sections at different levels.

Section VI, which occupies a greater space than any of the others, and is also more difficult owing to the complexity of the parts, traces the course of the various fibres in the cord and in the brain.

Section VII briefly treats of the cavities of the central nervous system.

An appendix on the rotation of the great brain is added by the translator.

The foregoing summary of the work will have given our readers some idea of the completeness with which it covers the ground of nervous anatomy, but it remains to be added, as one of the distinctive features of this book, that it contains also a statement of pathological conditions, not professing to be exhaustive, but extremely interesting and useful, from its being appended to the anatomical description.

In reading the book, we are constantly wishing we had various preparations and sections of the brain at our hand to follow the author in what is necessarily often a very complex description. In default of such preparations, he has supplied us with numerous admirable illustrations, many of which ases
in duplicate, the one being a life-like drawing of the preparation, while the other is a sketch outline with figures indicating the various parts.

Obersteiner recognises that there is a good deal of hypothesis attached to, e.g., the description of the relations of the various sets of nuclei and fibres in the pons, and it is well to point out that he does not seek to dogmatise where there is not good ground for it. He has aimed at presenting his readers with a thorough description of all that is at present known of his subject, and all of which he has confirmed by personal observation. He has followed a plan which makes it comparatively easy to follow him in his investigations, even without having the organs at one's hand for examination. The translator has not only managed to put his work into a good English dress, but he has added numerous annotations which increase the interest and the value of the original. To those of our readers who are interested in the structures and functions of the nervous system, we can recommend this book, but with the proviso that they must be prepared for hard reading, and not enter on its perusal with the idea that in a brief space they will learn all that they want to know about these parts.


These lectures cover a well-trodden ground, yet they are not devoid of interest. The first is concerned with the pathology and affinities of tubercle, and a close analogy is shown to exist between tubercle and leprosy, the inference being drawn that, as the one has been made to disappear, so may the other in course of time. The various factors entering into the etiology of phthisis are fully discussed—climate, site, malnutrition, overcrowding, heredity, &c., each receiving its due place. With regard to the latter of these, Dr. Ransome practically adopts the view of Niemeyer, that it is a peculiar vulnerability of tissue which is hereditary, and not the disease itself. None of the predisposing causes of phthisis can induce the disease without the introduction of the tubercle bacillus; hence Dr. Ransome clearly lays down the infectiveness of phthisis.

He carefully considers the question of the portals by which
the bacillus gains entrance into the body, and while giving
due weight to its infection with tuberculous food and milk,
he attaches greatest moment to the entrance of the micro-
organism by the air we breathe. The discussion of the
development of abdominal tuberculosis from affected food or
milk is not gone into, these lectures being on phthisis.

Dr. Ransome's views on prevention are, of course, based on
his belief in the infectiveness of the disease. Over and above
the usual treatment by sunshine, air, and food, he lays stress
on the segregation of the sick, and is in favour of the building
of numerous consumption hospitals. The excretions of con-
sumptives should also be carefully disinfected and burned.

Our more definite knowledge of its causation, and the wide-
spread interest in the subject, lead to the hope that by and
bye such precautions will be taken as will lead at least to a
great diminution in the mortality from tubercular diseases, if
not to their extinction as a cause of death.

While these lectures present us with little or nothing that
is absolutely novel, they have, as it were, focussed what is
known on the subject, and they present the views of a man
who is highly competent to express opinions on the questions
arising out of this always interesting disease.

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Asthma. Considered Specially in Relation to Nasal Disease.
By E. Schmiegelow, M.D., Consulting Physician in Laryn-
gology to the Municipal Hospital, and Director of the Oto-
laryngological Department in the Polyclinic at Copenhagen.
London: H. K. Lewis. 1890.

This monograph is written to emphasise the connection
between asthma and nasal disease, but we must give the
author the credit of not having ridden his hobby too hard.

He begins with an interesting historic review of the
theories of asthma, in the course of which it is made apparent
that he accepts as best that of Germain Sée, which may be
briefly stated as regarding asthma as a neurosis of the respira-
tory centre in the medulla oblongata, capable of being excited
through various reflex channels. Hack's views as to the
importance of the nasal cavities as a centre of this irritation
receive due prominence and discussion.

A summary is given of 71 cases of nasal disease associated
with genuine or pseudo-asthma, treated by the author. These
were culled from a total of nasal diseases, as follows:—139
cases of nasal polypi, of which 31 had asthma, and 514 cases
of chronic rhinitis, of which 40 had asthma. After excluding 21 cases for various causes, he finds that of the remaining 50, 32 cases were cured, 11 were improved, while 7 gave no result whatever, by treatment of the nasal disease.

Schmiegelow takes up the position that in all cases of asthma the nasal cavities should be explored, and when a lesion is found there of such a nature as to suggest a probable connection between the two affections, the patient should be put under competent treatment. By this latter, we presume he means a specialist, as he dismisses the subject of treatment very summarily, without any details.

The little volume contains many proofs that it is the work of a foreigner; but Dr. Schmiegelow must be congratulated on the facility with which he writes English.

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Mr. Bennett's monograph on varicose veins is already well known, and his studies on that subject have led to a consideration of the nearly allied subject of varicocele. The author's personal observations include about 250 cases, but the incidence of the affection has been studied upon a wider basis of statistics, obtained from various sources, including those furnished by the examination of recruits for the army over a period of ten years.

The salient points of Mr. Bennett's thesis are his views as to aetiology, as to the selection of cases for operation, and the special form of operation which he recommends.

To mechanical causes he attributes little importance, and that only secondary, as aggravating a condition which is of congenital or developmental origin. Cases are recorded in early childhood, and dissections have even found the essentials of the condition in the foetus. Its relation to wide-spread anomalies of the venous system has been shown; the veins themselves are nowise in a state of simple dilatation as from pressure, but are thicker walled than normal, and gape on section. Further, the frequent onset or aggravation of symptoms at puberty is not explained merely upon the ground of the increased attention of which the parts may then be the object, but rather upon the ground of participation by the veins in the heightened formative activity of the testicle at that period. With reference to increase of the varicocele at later periods, this would seem to be related more to condi-
tions of engorgement of the portal system than to any other cause. The possibility of any influence being exerted by a loaded colon, in the way of actual pressure, the author holds to be undemonstrable. The relation of the spermatic veins to the mesenterics being principally, if not entirely, confined to the left side, serves to throw some light on the greater frequency with which the condition becomes aggravated on the left side. Two principal varieties are recognised, the large veined and the small veined type. It is the latter which is apt to be associated with imperfectly developed testicle and with rapid growth at various periods and under special circumstances.

With regard to the benefits to be obtained from operation, Mr. Bennett's views are encouraging. They are clearly stated and supported by cases observed over considerable periods. His mode of operating involves the removal, along with a mass of the venous column, of a portion of the spermatic artery; but this procedure he holds, "if the ordinary rules of surgical cleanliness be observed, is not only harmless to the testicle, but aids in the ultimate relief of the affection by diminishing the pressure of blood going to the testis at the time when almost all the returning veins are suddenly obliterated." The risk of sloughing or atrophy of the organ is in sepsis and inflammatory "choking" of the collateral circulation.

Mr. Bennett has given us a careful enquiry into the subject of varicocele, and his book will, we doubt not, be found of much assistance by those who are concerned in the treatment of the condition.

Lectures at St. Peter's (in 1890) on some Urinary Disorders connected with the Bladder, Prostate, and Urethra. By REGINALD HARRISON, F.R.C.S., one of the Surgeons to the Hospital; Hunterian Professor of Pathology and Surgery at the Royal College of Surgeons of England. London: Baillière, Tindall & Cox. 1890.

These six lectures cover ground which has in great part been already gone over by the author in previous works. They are part of a clinical course, and contain matter of much general interest, discussing, as they do, the prevention and early treatment of prostatic obstruction, the operative treatment of advanced forms of prostatic obstruction, points in the therapeutics and hygiene of the bladder, haematuria, and the early treatment and detection of stone in the bladder, &c.
The author's wide experience qualifies him to treat of these subjects in such a way as to throw much light on them. If, however, the lectures were worth publishing, as we believe they are, it must have been equally worth while to put them in a proper form. But the absence of careful revision is visible in almost every page in the form of grammatical errors, &c., which are a source of considerable irritation to the reader.


It is but little more than a year since we reviewed the former edition of this book, and there are no changes in this edition which call for special remark. The fact that a new edition has been found necessary after such a short interval may be taken as sufficient proof of public favour. The publishers have spared no pains to give the book an attractive form.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

Session 1891-92.

Meeting II.—6th November, 1891.

The President, Dr. Joseph Coats, in the Chair.

Discussion on the Presidential Address.

This meeting was devoted to a discussion of Dr. Coats's recent address on "The Spontaneous Healing of Tuberculosis: Its Frequency and the Mode of its Occurrence." Dr. Coats, who presided, announced that it was proposed to hold a further discussion on "Tuberculosis as an Infectious Disease," later in the session.
Dr. Gairdner felt that he was perhaps rather at a disadvantage in opening the discussion, in respect that he did not hear the paper of Dr. Coats, and in fact did not know of it till seeing it in the British Medical Journal, and even then had had no opportunity of reading it till a few days before this meeting. They would oblige him, therefore, by considering that what he had to say had not had the elaborate attention to the subject which he would have liked to give to it, and which he felt to be appropriate and suitable.

The paper of Dr. Coats, he was bound to say, had been to him a very interesting, and, in many points, satisfactory one. He would keep himself rigidly to the bounds prescribed for the present discussion. There was quite enough in this paper to raise many questions and to give rise to different views, yet he thought these views would be dominated by the feeling of respect, which he himself shared, for its carefulness, precision, and logical force, and that, whether one agreed with it or not, he must feel that it was impossible to disagree with it without having good grounds to state for doing so.

Taking the different points in their order in the paper, the first paragraph was as to the prevalence of tuberculosis, and in regard to this Dr. Coats had reached a conclusion which must have been rather startling to those who were present. He said—"If we take into account the cases of external tuberculosis, we shall not be far from the truth in saying that about half the persons born into the world are at some period of their lives affected with tuberculosis." This was a startling idea, a very startling conclusion, if it was to be a conclusion. Dr. Gairdner was not quite able to accept it, but he thought that Dr. Coats had shown a case that must be considered. Personally, if he had just to go by figures, Dr. Gairdner would feel bound to accept it. In smaller figures, on the same lines as Dr. Coats, more than 40 years ago, he had engaged in a similar research, and arrived at almost the same conclusion. He was very sorry he had not in his hands the whole details of that research, as they had been mislaid, but he had a set of notes upon his lectures from which the general conclusions might be obtained.

At the time he was a student the whole subject of healed tuberculosis was a subject of interest in the Edinburgh school. Dr. Hughes Bennett was constantly preaching it, and Dr. Gairdner became familiar with the subject and the facts connected with it. He was a little sceptical of the whole of those cicatrices being tubercular; and under those circumstances he thought (being pathologist at the Infirmary) he would take a
certain number of cases, without selection, and would go through the different organs with a degree of care that would enable him to say that there was no organ in which any tubercular lesion was present without being found. He chose a time when no epidemic was prevalent, and therefore the cases were the miscellaneous cases of a general hospital which, having no "lines," admits almost everyone that comes to its doors.

The total number of cases thus examined after death was 59:—

(a) In 16 (i. e., 27 per cent) there were advancing tubercular lesions—plain and distinct—mostly phthisis pulmonalis: in these it was plain that it was death from tubercle.

(b) In 5 (i. e., 8 per cent of the whole) there was retrograde, or not advancing, tubercle.

(c) In 10 (i. e., about 17 per cent of the whole) there were obsolete lesions in the lungs or elsewhere, most of them being these cicatrices at the apices of the lungs.

Summing up, there were 31 cases (i. e., 50 per cent); that is to say, that one-half of the bodies examined contained traces of what he judged to be, more probably than not, tubercle. In the last figure [class (c)] any deduction chosen might be made—e. g., for cases of cretaceous nodules, the actual cause of which was not clear; but even with reductions there are 45 per cent, and that corresponds with Dr. Coats's figure.

These were the primary data upon which his mind worked during the time of his pathologistship, and which he had had to deal with ever since in lecturing on the subject of tubercle.

When one compared these data with the Registrar-General's returns, a very remarkable difference was found. Is it possible, he asked, to reduce this difference to any degree of correspondence?

In the first place, there was a point, which Dr. Coats did not raise, as to whether the dead bodies of a hospital such as the Edinburgh Royal Infirmary, apart from epidemic disease, were a fair sample of what might be expected if one could get the average of the general population. Dr. Gairdner thought not, but that there was what Darwin might call a kind of "natural selection," for in the hospitals there are probably more of the tuberculous class than in the general population, and those who do not go into hospital might be expected to be away from the influences favouring tuberculous disease. He had found it so—three or four times as much tubercular disease occurring in the wynds as in the west end. So he thought that there was a sort of "natural selection" in favour of
tubercle here, and that the average should be somewhat lower.

Coming to discuss the Registrar-General's returns, Dr. Gairdner said that he had taken the year 1861 as a convenient one for calculation through its being a census year. In England and Wales there were then, roughly, 20,000,000 people, of whom 435,000 died in that year, the deaths being at the rate of 21.62 per 1,000 of the population. The deaths actually stated as from phthisis were about 52,000, or about 12 per cent of the total deaths; but it was quite obvious that "phthisis" cannot represent tubercular disease. There were to be added others that the Registrar-General classes as tabes mesenterica, hydrocephalus, scrofula, and those added 15,000 more. Even thus, was the number exhausted? He thought that every practical physician, at least every practical physician who has served on insurance duty, must answer "No." If one heard of a woman dying six weeks after childbirth, even though the death were ascribed to childbirth, one would think of tubercular disease. If one heard of a person dying of "bronchitis," within the tubercular age, one would say "tubercular disease." There was no possibility of getting an accurate statement of such cases, but he had tried to get it thus. 60,000 deaths occurred in England and Wales from "bronchitis," "pneumonia," and other "diseases of the lungs." he claimed a considerable proportion of those for tuberculosis —say, one-third; thus 20,000 might be put down. Then there were a number (60,000) of deaths of children from "convulsions," "teething," "diarrhoea," "atrophy," &c., of which, again, he claimed a large proportion—say, one-third. Then there were deaths "in childbirth," and in a number of other circumstances that did not carry tubercle on the face of them; of those he claimed a number—say, 1,000. Summing up, there were 108,000 deaths which might be from tubercular disease, and the cipher was thus raised from 12 per cent to something like 25 per cent, approximating towards Dr. Coats's figure, and making it more probable. In all this he was speaking of deaths that were due to tubercular disease, but there were also those who did not die of anything dominated by tubercle, but who had tubercles in their bodies. Here he came back to his own statistics from the hospital, and there were to add 23 per cent of the total deaths, raising the number from one-fourth to more than one-third. Thus, considering the Registrar-General's returns in this way, one worked up from one-eighth to one-third. In all this, Dr. Gairdner remarked, there was a good deal of fancy, but when he said
that he had applied the same rules to Scotland, and had found the same results, with a different registrar and a different system of registration, he thought they would agree that some reliance might be put upon his calculations. It might thus be said that they had made statistics and pathological inquiry tell very much more the same story than had seemed at first, or than Dr. Coats appeared to have thought.

Another important point he considered to be that to which reference was made in the work of Dr. Farr, and which Dr. Gairdner called the "secular variation" of the death-rate of phthisis and death-rate of other diseases—the variation from year to year over a number of years. In Farr's valuable work on Vital Statistics (in the publication of which Dr. Gairdner was glad to say he was to some extent instrumental), at p. 266, there were several pages devoted to the analysis of deaths from phthisis, bronchitis, &c. Ever since vital statistics had been taken in England, deaths from bronchitis had been an ascending figure, and deaths from phthisis a descending figure; deaths from lung diseases, including everything but phthisis, had been increasing. Dr. Farr asked—"Is it to be inferred that there has been an actual decrease of death by consumption, and an increase of death by bronchitis? Is the effect of the treatment by cod liver oil in phthisis visible in the returns?" This question had been before Dr. Gairdner's mind ever since he was a student, and he must answer "No;" he did not think they could at all rely on the death returns as regards a "secular" increase or decrease of any disease, because what those returns bear is merely the medical opinion, or rather the average opinion, and the certificate often founded only upon that. He would say that there was a circumstance bearing upon this which was often overlooked, and that was the stress put by insurance companies on death from consumption in the family. There was an unwillingness to regard a death as from consumption, and some thought that, if there was a doubtful death, one was warranted in not ascribing it to tubercular disease, although the feeling, from the medical point of view, might be that it was probably due to tubercular disease. Thus a good many deaths, really believed to be tubercular, were recorded as something not implying this tubercular origin. Thus it was as good as certain that the diminution of recorded deaths from phthisis, concurring with the increase of recorded deaths from bronchitis and lung disease in general, did not mean a decrease of phthisis, but merely that cases that might fairly, under other circumstances, have been registered as tubercle are often registered otherwise.
Thus Dr. Gairdner thought that Dr. Coats was not very far out. He thought he was a little out, and he was disposed to admit that, if they could get statistics from the general population, they would find that the prevalence was lower than Dr. Coats stated, but not so low as the Registrar-General's returns would suggest, because his statistics are biased the other way. They had to hitch his up, as they had to drag Dr. Coats's down, to find the right thing. He had only to add that he was greatly pleased with Dr. Coats's account of Metchnikoff's observations, and though he did not know whether they were correct or not, he hoped they were, and that there were a good many of us with plenty of phagocytes to render us proof against tuberculosis.

Dr. Harris (of Manchester) expressed the great pleasure it gave him to be present at such an important discussion. So far as he could gather from the literature of the subject, he thought it was not too much to say that Dr. Coats's communication was the most complete published, in any language, on the spontaneous healing of tuberculosis. As the time at his disposal was so short, he would reserve himself to the question of the healing of tuberculosis in the lungs. He had paid most attention to this, because, at the Manchester Royal Infirmary, he had examined the bodies to see how many of those dying, during one year, from every cause, contained evidence of past tubercular lesions of the lungs. The previous statistics made by himself as Pathological Registrar, and by his predecessors, he found to be absolutely of no use, because they were not made by any one specially interested at the time in the subject, and, if a man is not thus interested, those small foci are apt to be overlooked. During those twelve months he found 38 per cent in all bodies over 20 years of age showing obsolete tubercles to the naked eye. The age of 20 was taken, because children are not usually admitted, and the number of post-mortems on children is very small at the hospital; and undoubtedly it was in adult life that one would expect to find tubercle healed, if healed at all. It was important to state that it was to the naked eye, because many of those apparently obsolete to the naked eye presented activity at the periphery when examined microscopically.

Statistics on this subject varied from 4.7 per cent to 51 per cent. This was certainly an astounding difference; but one could, to a certain extent, explain the discrepancy. In the first place, it was not certain as to what obsolete tubercle was, as Dr. Gairdner had hinted in his sub-division of cases; and Dr. Harris would venture to call attention to one lesion which
was often put down to involuted tubercle. It was not an extensive lesion; it was a thickening of the pleura at the apex of the lung; it was thickened and glazed, and this thickening extended over an area commonly about the size of half-a-crown. It extended no great distance into the lung—often not at all, and was sometimes calcareous. Such a lesion was certainly not tubercular; at least he had excluded it from his own specimens. Dr. Harris's own statistics (38 per cent) he regarded as probably high; they must be so, he said, if they were to be taken for the population generally. Dr. Coats had said 23 per cent, and he thought that that was as nearly correct as human calculation could make it.

But when one got those apparently healed lesions in the body, they were a sort of risk to their owner. The risk was from local spread, and also from general absorption and acute miliary tuberculosis. Such foci from the lung could not be regarded as perfectly healed unless they were either completely transformed into fibrous tissue or completely calcified. Inoculation experiments were quoted to bear this out.

He thought that altogether three classes of cases could be recognised:

1. The foci are represented by fibrous tissue or calcareous matter, and foci of this kind are usually extremely small, and usually pass unrecognised, the patient dying from something else.

2. The foci are not calcified, or only imperfectly so. In these they had the risk from subsequent extension, the tubercular affection breaking out again, and producing ordinary phthisis, or absorption leading to acute miliary tuberculosis. If one examined such foci microscopically, one was struck by finding, with the microscope, activity in what seemed to the naked eye to be obsolete. So, if one man made out statistics from microscopic observation, and another from macroscopic, the figures would be different. Dr. Harris showed a specimen which looked, on the face of it, quiescent, but the patient had died from acute miliary tuberculosis, and the microscope showed a great number of tubercle bacilli in the apparently quiescent focus. The only way to prove such facts would be by inoculation experiments.

3. The third class represents many cases of phthisis. Phthisis did not progress from bad to worse in a continuous scale, but there were periods of rest, the patient improving and gaining in weight; some such periods were of considerable duration. In the majority of such cases the physician could not say that the lung was healing proportionately to the gain
in weight and improvement in general condition. The majority of such cases led to death from tubercular mischief.

In conclusion, Dr. Harris remarked that those observations on the healing of tuberculosis were of the greatest importance to the therapeutist. He had tried several forms of treatment, and could not satisfy himself how much increase of weight and improvement in general condition was due to the *via medica*

Dr. Harris showed a number of specimens illustrating the different points in his remarks.

Sir. Dewar asked as regards Dr. Gairdner's statistics for Scotland, and suggested that many sudden deaths, recorded as "heart disease," in which there was lung complication, might be added to swell the numbers of those dying from tuberculosis.

Dr. Milroy asked Dr. Coats as regards the number of his cases. He seemed to found a theory (that one half of the human race is affected at one time or other with tubercular disease) on numbers so small as to be worthless. Dr. Gairdner had thrown out a hint that deaths in the Infirmary could not be relied upon for giving general results, and Dr. Milroy thought that the smallness of the numbers constituted a further fallacy.

Dr. McCall Anderson apologised for allowing his name to appear upon the billet. He had thought that the question to be under discussion was the *healing* of tuberculosis and not the spontaneous healing. If all those cases healed spontaneously there would soon be no use for physicians and surgeons at all. The aspect of the subject they were now dealing with was the anatomical one, and he thought it should be left to the pathologists. He suggested that a further discussion, from the clinical point of view, might follow.

Dr. Coats thought that the clinical side was quite open to be discussed under the present heading.

Dr. Hugh Thomson said that there was just one little matter bearing upon the subject that he had some experience of, and that was in very young children—i.e., children under six months of age, which he had to vaccinate. He was in the habit of examining the neck and occipital regions carefully for enlarged glands, and had been surprised often to find...
enlarged cervical glands, particularly in cases where the children were not thriving. This seemed to him an evidence that tubercular disease begins even so early as that. It would probably arise in that case from the milk, and how far those glands themselves were really tubercular he was not prepared to say, because he had had no opportunity to examine them post-mortem. He thought it would be worth while for pathologists to examine in such circumstances.

Mr. Clark had noticed very much that in Dr. Gairdner's address he did not make any reference to surgical disease, and he thought he should add some thousands for that.

Dr. Gairdner—They come in under "scrofula;" they are included.

Mr. Clark, continuing, said that Dr. Coats had reminded him that he had mentioned some surgical affections in his paper, and had shown some specimens of bone disease. All were familiar, he hoped, with cases showing healed surgical affection. They were healed by a process of suppuration and destruction of the focus in the great majority of cases at least. In an old case of spinal disease, which had undergone healing by abscess, he had found lately that there was now return of the disease. This was just an example of many cases, where the disease was restarted years after, and it bore out what Dr. Harris had said—that the foci were often not dead, but merely quiescent, to awaken up at some later period.

The number of cases of caseous glands evacuated was very great. This might be inferred from the fact that every fourth or fifth person met upon the street showed marks of old lupus, or ulceration, or disease of the glands. So that Mr. Clark was not prepared to suggest that Dr. Coats's statistics were overstating the real condition of affairs. It was true that Dr. Coats's numbers were small, and, as Dr. Gairdner had hinted, the class of patients dealt with was not fairly representative of the Briton of the present time. On the surgical side, he could speak for this very strongly, because in the chronic wards the cases were preponderantly tubercular.

Along with the healing by suppuration, it should be remembered that one very rarely got miliary tuberculosis from a surgical affection. It was also to be noticed how extensive surgical disease might be, and how one might have the joints diseased to a large extent and yet might never have tubercle in the lungs or any signs of phthisis. The great difference between surgical disease and lung disease was so marked that the old distinction between scrofula and phthisis
was a true clinical difference; and, although unsatisfactory pathologically, the name “scrofula” represented a different class of cases clinically.

As regards the healing of those tubercular affections, one's experience, especially in disease of the hip and of the knee, was that one could never be sure of an absolute cure. However disagreeable it might be, after many years they did come back, and some focus of tuberculosis was set up either in the same part or elsewhere. So that it was doubtful if the healing was so satisfactory as one was apt to pride himself that it was.

Mr. Clark thought that Dr. Coats's statistics were not overstated, but perhaps understated, with this reservation, that they apply more to hospital patients than to the general public, and that one must look to the classes better educated and better clothed, both in town and country life, to bring down the statistics he had given.

Dr. Lindsay Steven said that he had really not very much to say upon the subject of the spontaneous healing of tuberculosis, because he was of the opinion that it was so clearly a fact that it was beyond the question of discussion; and, therefore, he had a difficulty in communicating anything new on the subject. He felt that Dr. Harris had raised a point of very considerable importance—viz., that many of the so-called anatomically healed cases of tubercle are not absolutely healed. He also had a difficulty in seeing how one could distinguish the anatomical healing from the clinical, because clinically one tried to induce that healing which, from the anatomical point of view, was known to take place spontaneously.

He could not agree with what Mr. Clark had said in regard to the absence of internal tubercular lesions in surgical cases. Dr. Steven had noted 125 to 150 consecutive cases of phthisis some years ago at the dispensary; and one of the objects he had in view was to see in what proportion there was evidence of surgical tuberculosis. His impression was that 20 to 30 of these cases had very distinct external tuberculosis. He had only further to say that his experience in regard to post-mortem had been precisely similar to that of Dr. Coats and Dr. Harris.

Mr. Parry mentioned the case of a little patient who had come to the Victoria Infirmary some time last year, with a number of abscesses over the body. These had been scraped and treated with iodoform, and they healed up, but the healing
process seemed to be different from that usually seen. Some time later the patient returned with pain in the lumbar region, and disease of the lumbar vertebrae was suspected. Mr. Parry had been anxious to have an early case of lumbar disease to operate upon, and this one seemed a favourable one for operation, but they had not been able to admit the patient. After another interval the lumbar disease was found to be quite healed, but there was disease in the wrist, which had since been operated on. He asked, was it something in the lumbar vertebrae that cured the abscesses, and something in the wrist that healed the lumbar disease? The healing in one part was followed by disease in another. He had argued for some years, that in the Children's Hospital such cases should be partly medical and partly surgical, and he did not think it should be left to the surgeon alone to decide whether a case was one for operation or not.

Dr. Coats, in concluding the discussion, in the first place, alluded to what Dr. Milroy had said in regard to the numbers upon which the statistics were based. He held that, when one had a series carefully observed without prejudice, 100 cases were then worth 1,000 taken at random. Three persons in that room, accustomed to make such observations, had at different times and in different places, taken cases as they came; and, though they were acting quite independently of one another, had come to almost exactly the same results. Dr. Gairdner had 23 per cent of cases of healed tuberculosi s: Dr Harris had come to a conclusion somewhat higher. Dr. Coats in 131 cases had come to a conclusion identical with Dr. Gairdner's—namely, that 23 per cent of the cases showed lesions of healed tuberculosis. He did not think that this agreement could be regarded as accidental, or that it was a true criticism that the numbers were small.

With regard to the "natural selection" of cases in hospital, it was very possible that his observations were open to the criticism that Dr. Gairdner had hinted at; but he was not in the habit of regarding the cases in the Glasgow Western Infirmary as so low in the social scale as Mr. Clark had stated. They were from the substantial working class, and there was a stratum below, as well as a stratum above, that, which did not come into such an hospital. The working class, as a whole, produced the majority of the population, and a still larger proportionate majority of deaths. So he thought, on the whole, that the Western Infirmary represented pretty well the large body of the population.
There was one point he had yet to allude to. There was no doubt that old foci, apparently inactive, still contained bacilli, and that disease was apt to recur. There was this remark to make, though, that in the cases of healed tuberculosis which he had brought together the deaths occurred in no sense from tuberculosis; tuberculosis had nothing apparently to do with it. This came out when one considered what were the ages at death as shown in his table. The ages were if anything higher than those in cases where there was no trace of tuberculosis healed or otherwise. Life in those cases was not abridged by the tuberculosis—at least, not seriously so, and death occurred quite apart from it. Of course this did not militate against the possibility that some apparently healed lesions might break out again, and give rise to further development of tubercular disease.

With regard to suppuration and destruction, he did not quite gather what Mr. Clark meant.

Mr. Clark said that his only point was that there was in surgical cases more outlet for the results of this suppuration and destruction, and that therefore surgical cases were more likely to heal.

Dr. Coats further thought that one of the objects of such discussions (as the present and the subsequent one to be held upon "Tuberculosis as an Infectious Disease,")) was to impress the fact on the community that tuberculosis was a disease in which treatment of various kinds and preventive measures were likely to result in a great diminution of it. That was a problem which must be faced by this and other countries; and if in Glasgow a strong opinion was given out in that direction, much good would be done. Looking to the large number of people in the streets, who showed evidence of old tubercular disease, and to the large numbers dying from tuberculosis in its various forms, and also to the number of post-mortem which showed healed lesions, one must consider the question whether by measures, such as he had spoken of recently in Edinburgh, some attempt might not be made to stay the advance of this malady.
GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

Session 1891-92.
MEETING II.—9TH NOVEMBER, 1891.

The President, Dr. David Newman, in the Chair.

I.—CASE OF CANCER OF OESOPHAGUS.

By Dr. David Newman.

Dr. Newman showed, as a fresh specimen, the oesophagus from a patient upon whom he had performed gastrostomy, about a year previously, as recorded in the Glasgow Medical Journal for March, at page 199. Details as to the structure of the growth will be published shortly, but are postponed meantime to allow of microscopic examination being made.

II.—CASE OF ENLARGED PROSTATE WITH CYSTITIS AND NEPHRITIC AND PERI-NEPHRITIC ABSCESSES.

By Dr. Joseph Coats.

This case, from which fresh specimens were shown, was one primarily of enlarged prostate with very marked middle lobe. There was the usual hypertrophy of bladder mucous membrane with trabecular appearance, but there were also one or two other points of interest. There was an inflammation of the bladder, and that had extended upwards, there being suppurative pyelitis and nephritis, with abscesses throughout the kidneys. An abscess had also formed below and around the right kidney. How had the septic process extended in this localised way to the neighbouring parts? There was a large simple cyst of the right kidney which had opened up the kidney tissue. It came to lie close to one of the calyces, and the suppuration seemed to have extended into the cyst and through its wall to the outside of the kidney, so that there was a general infiltration of the psoas muscle and the parts around. The accidental coincidence of this cyst Dr. Coats took to be the explanation of the peculiar method of extension of the suppuration. There was another small cyst in the kidney of a similar nature.
III.—CASE OF ANEURYSM OF THE INNOMINATE ARTERY TREATED BY MACEWEN'S METHOD.

By Dr. R. S. Thomson and Dr. Dalziel.

Dr. Dalziel showed, on behalf of Dr. R. S. Thomson and himself, a specimen of aneurysm of the innominate artery treated by Macewen's method. He referred to the account of the medical, surgical, and pathological aspects of the case, which had been published in the October number of the Glasgow Medical Journal.

Dr. Coats knew of the case simply from the pathological aspects of it, and he thought that, though the ultimate result had not been successful, it showed evidence of the great advantage that was likely to obtain from the operation. Indeed, it showed this in a way which they would not have had if it had been more favourable. They could see the result five days after operation—a result exactly the same as Dr. Macewen had stated—viz., a mixture of white and red thrombi. The amount of thrombus was much greater than he would have expected.

Dr. Macewen asked whether the pins went into the false aneurysm.

Dr. Dalziel—Wholly. It was the false aneurysm that was killing him. The true aneurysm was of the size of a walnut, and had firm walls.

Dr. Macewen was very much interested in seeing the specimen and in hearing about the case. He had previously read the account of it in the Journal, but had not been clear as to whether the needles went into the false or the true aneurysm. He had had a case almost the same as regards position, the aneurysm being of the innominate and the aorta being raised up. In that case he had an opportunity of introducing pins on two or three occasions, and the patient had taken suddenly worse three weeks afterwards, with a great deal of dyspnœa. Dr. Macewen had been summoned, and thought tracheotomy required, but the man had assured him that he often had those attacks and recovered from them. He had examined the lungs and found little air entering. He advised the performance of tracheotomy, and meant to have introduced a long tube into the larynx; but he did not insist upon the operation, as it was just possible that they might have introduced the tube into a thin part of the aneurysmal wall. At that time he did not know that they had so much thrombus as was afterwards found to be present,
or he would have insisted. The patient had died from suffocation, and afterwards they had found, not a false aneurysm, but a large innominate aneurysm, measuring 3 inches between the inside walls, with ½ inch on one side and 1¼ inch on the other side filled up with white thrombus. There was no red blood inside at all. The orifice at the aorta was ½ inch in thickness. If the patient had lived for another fortnight, he had no doubt the sac would have been solid.

Another case he had seen recently had a large aneurysm of the left subclavian, with swelling of the arm and also pain from pressure on the nerves. It had been operated upon, and the woman was now in active duty as a cook. That case had progressed much more slowly, and the slower the better. Then, in Edinburgh last week he had seen a gluteal aneurysm, which had been operated upon by Dr. Miller. The patient died some weeks after from cancer; in the aneurysm there was stratification; the whole thing had been filled up. One point in regard to the introduction of the pins into an aneurysm was that he thought there should be a selection of cases. If they took cases that could not get better otherwise, he thought they would have a great many pathological specimens. He had lately had a letter from London, wishing pins to be sent in all haste to operate upon a very large abdominal aneurysm; and he had purposely withheld the pins for forty-eight hours until he might have opportunity to reply by letter to warn those in charge of the case that it was just such an one as might readily give rise to hemorrhage under the peritoneum, and that if they introduced the pins they might find themselves blamed for causing this hemorrhage. He did send the pins by a subsequent post, but they arrived too late, as the aneurysm had leaked behind the peritoneum, and the patient was dead.

With regard to very large aortic aneurysms in the chest, he had a doubt whether the filling of such aneurysms with white thrombus would effect a cure. He had a feeling that if such an aneurysm were filled up, a strain would be thrown upon a weak heart, and that was an objection. It was an a priori objection, but he must say that a number of cases presented to him, with a view to operation, he had thought unsuitable—unless for pathological specimens.

Mr. Maynard had two questions which he would like to ask Dr. Macewen. The first was a pathological one, and it was as to whether he thought that a clot was likely to form more favourably in a false than in a true aneurysm. The second question was a clinical one. He had lately been asked by Dr.
Duncan, in the Victoria Infirmary, to see a case as to whether it was a suitable one for the introduction of the pins. The aneurysm was at the upper part of the abdominal aorta; it was not a large one, but when he came to examine it—and he had examined it more than once—the stomach was lying over it; at least there was tympanic note over it, and he thought it would be impossible to reach it without penetrating the stomach. He believed that Dr. Macewen laid great stress upon the cleansing of the skin, so he felt that it was very doubtful if he could have introduced the pins aseptically. The man had died suddenly, and no doubt it was a case where the aneurysm had ruptured.

If he understood Dr. Macewen right as to the selection of cases, did it not amount to this, that cases that were best for operation were those most likely to cure conservatively?

Dr. Finlayson said that the case shown that evening was from a patient in his ward who had been admitted during his absence, and that Dr. Thomson, who had charge, happened to catch him in passing through town, and described the condition of the aneurysm to him, and asked his opinion on the subject of this treatment. Dr. Finlayson had said that he thought, on the whole, from what was stated to him, that it was a fair case for trying the operation, for he confessed that he had been much impressed with his inspection of the case of subclavian aneurysm to which Dr. Macewen had referred. His opinion was that that aneurysm (of the subclavian) had extended to the aortic arch, and the recovery had been so complete that ever since he had seen that woman he had always kept in view this form of treatment.

He must admit that any form of treatment of a large thoracic aneurysm must be likely to be unsatisfactory; but in cases of this kind, where the innominate was affected, and where one could get the aneurysmal sac filled up without loss of life, he thought that the facts of that case of Dr. Macewen's and others spoken of that evening were very suggestive.

He had been inclined to ask the same question as Mr. Maylard, as to whether the result here was from this being a false aneurysm.

Dr. Macewen said, in regard to this discriminating between false and true aneurysm, that he thought the thrombus would form a great deal better in a true aneurysm. He did not know what would happen in a false aneurysm; he would say that a false aneurysm was a bad one, in this respect, unless the walls were very vascular. If they asked him whether he
would prefer a false or a true aneurysm, he would say a true aneurysm.

Dr. Newman asked what was to be understood by a false aneurysm, as there was so much confusion on that point.

Dr. Macewen replied that he meant one in which all the arterial coats were entirely gone, even the tunica adventitia; he understood that to be the case in the present specimen.

With regard to the question as to the selection of cases, he said that one would have a greater opportunity of curing in favourable cases. What he meant was that, in cases of very large aneurysm in the thorax near the heart, he thought that nothing would cure them; he could conceive of their walls thickening. Besides other difficulties, there was a very large bulk to fill up, and he doubted if such a large bulk of fibrin would live, even though it were formed.

Dr. Finlayson—What about the question raised by Mr. Maylard as to the stomach?

Dr. Macewen replied that that point was raised in the discussion on his paper, and Mr. Lawson Tait had said that what he would do was to open the abdomen, and then introduce the pins. Dr. Macewen had said he supposed he was joking. In a case he (Dr. Macewen) had they blew up the stomach to ascertain its size, and then emptied it, and he believed he was free from the coats of the stomach.

Mr. Maylard—Was it dull over the aneurysm?

Dr. Macewen replied that it was, but that the aneurysm was a much larger one than that to which Mr. Maylard had referred. For confirmation they had the stomach blown up a second time.

Dr. Newman—Is there not danger of perforating the intestine?

Dr. Macewen said that there was, but that he would not hesitate to perforate the intestine were it not for the danger of introducing sepsis.

IV.—CASE OF MULTIPLE SARCOMATA OF THE BONES ASSOCIATED WITH ABSCESS.

By Dr. Joseph Coats.

The account of this case will be found in full at p. 420.

Mr. Maylard said that the fact of there being no lesion in the lungs favoured the theory which Dr. Coats had advocated.

Dr. Gairdner asked if Dr. Coats regarded the pus as a result of the fractures.

Dr. Coats—Yes.
Dr. Finlayson—Where did you say the pus was?

Dr. Coats—in connection with the fractures, both of the femur and of the humerus.

Dr. Newman had seen the case at the Western Dispensary when the tumour occupied the sternum only, and when he had seen him again, after a considerable interval, he had hardly been able to recognise him. While the man was alive Dr. Coats had argued that the tumours were much liker cancer, though Dr. Newman argued they were sarcomatous. What Dr. Coats had said about the tumours being limited to the bones was a very important point, for, so far as he had seen, those cases had other lesions in other organs—perhaps even osseous new growths. And the idea that this had followed more the course of an inflammatory formation than of tumour-formation was quite to be considered. When one remembered the close resemblance between small-celled sarcoma and inflammatory formations, it made that idea all the more probable. It was the future history often, rather than than the anatomical appearance, that enabled one to distinguish these conditions.

Dr. Macewen asked Dr. Newman if the patient was able to stand when he had seen him first.

Dr. Newman answered that that was three or four years ago, and that he was quite able then to go about.

Dr. Macewen—Then the tumour in the sternum was the primary tumour.

Mr. Clark thought that he had seen the case at the Royal Infirmary—at least there was a case with the same name and of the same nature.

Dr. Coats, in reply to questions as to the microscopic characters of the diseased parts, and as to his being satisfied that the structure was sarcomatous, said that he was satisfied that the tumours were composed of homogeneous cells, of round or polygonal shape, and that he did not know any other name for such a structure.

Dr. Macewen asked if Dr. Coats would not then have expected lesions in the lungs; almost every vertebral body was involved, and the disease had been going on for a number of years.

Dr. Coats thought the specimen unique.

Dr. Macewen asked if that was not a reason for delaying naming it.

Dr. R. M. Buchanan would like to suggest a relation to leukæmia.

Dr. Macewen asked if there were any history of syphilis.

Dr. Coats replied that there was not.
Dr. Rutherford said that, as regards its being unique, he had to remind Dr. Coats of one case in the Western Infirmary, which occurred a couple of years ago. There were tumours of the ribs, and death occurred from asphyxia, due to the failure of respiration from multiple fractures.

Dr. Coats added that, in saying it was unique, he must make exception in one or two cases. In one case the whole humerus became transformed into tumour tissue, and then subsequently the other humerus became similarly transformed. That was Sir George Macleod's case.

Dr. Macewen—What was the tumour tissue?

Dr. Coats replied that it was rather an odd tissue. He had named it "sarcoma," because it originated in a connective tissue structure. It was composed essentially of very large single-nucleated cells.

Dr. Macewen said that he had a case just then, where first the whole shaft of one tibia became swollen; the epiphyses on both sides were free. He had thought that possibly after incision it might subside. Some yellow points appeared on incision, and he thought of actinomycosis, but had not been able to find any proof of that. It was not syphilitic, and not tubercular. They had taken out a large portion of the swelling in the hope of doing good if it were an inflammatory enlargement, but it was as big as ever again, and he was at a loss as to its nature. Lately there had been slight thickening of the other tibia, but there was no affection of other bones. The material found on incising was rather soft and cheesy, and there was a considerable amount of spicules. The cells he would scarcely call sarcomatous; they were not very large. In the meantime the case had been left unlabelled. In Dr. Coats's case they had the whole of the bodies of the vertebrae affected and pulpy, but the discs were not involved.

Dr. Newman—Was it pretty nearly symmetrical?

Dr. Coats—Not quite. One side of the tumour of the sternum was much larger than the other, and the ribs were not symmetrically affected.

Dr. Macewen—Was it like osteomalacia?

Dr. Coats said that it was not—that he would not take it to be that. The bone that remained, as shown in the sections, was good bone, merely broken down.

Dr. Macewen remarked the spinal processes also had escaped.

Mr. Maylard—Was the sternum the only part showing a prominent growth?

Dr. Coats said, "No"—that the femur and humerus, and also the ribs, showed prominent growths.
V.—CASE OF PERFORATION OF THE HEART.

By Dr. Joseph Coats.

Dr. Coats showed the specimen from this case, the right auricle being the part affected. The report of it is given in full at p. 427.

Dr. Macewen—Was there much blood escaped from the heart?

Dr. Coats quoted from the report that the sac of the pericardium was filled with a blood-coloured fluid, &c. (see report.) Mr. Maylard asked if Dr. Coats supposed that leaking had been going on all the time.

Dr. Coats thought not, because the patient got so much better. He thought that there was first closure by fibrin, and then this afterwards gave way when septic changes occurred. The patient kept well for seven days, and then there was sudden onset of acute symptoms.

Dr. Gairdner asked as to the actual occurrence of pericarditis. There would appear to be pericarditis, but that might have been an appearance due to a deposit from the blood first thrown out and subsequently coagulated—churned by the action of the heart. That would closely resemble pericarditis.

Dr. Coats was satisfied there was pericarditis.

Dr. Macewen asked why sepsis was diagnosed.

Dr. Coats said streptococci had been found.

Dr. Macewen asked if there was any pus about the wound.

Dr. Coats replied that that would have been washed off.

Dr. Gairdner could not remember any case like the present, as regards the length of time of living after puncture of the auricle. When the ventricle had been punctured there was more chance because of the greater thickness of the wall.

Dr. Macewen remembered a case in Dr. Dewar's ward, when he was a house surgeon, when life was prolonged for a number of days—he did not remember how many. The patient had died apparently from the blood in the pericardium crushing the heart. The question had been raised as to whether something should not have been done to relieve this pressure.

Dr. MacPhail thought that the cause of death in the present case had not been brought out. If it had been from fresh bleeding from the wound of the auricle into the pericardium, that should have been easily made out from the
appearance of the blood in the pericardium after death. He raised the question whether the auricle had actually been penetrated.

*Dr. Coats* said that there was a long wound of the auricle, as described in the report. He agreed with Dr. MacPhail as to the cause of death being still indefinite.

*Dr. MacPhail* had examined a number of cases in which the death was from bleeding from the auricle, and had found a quantity of fresh blood in the pericardium.

*Dr. Gairdner* interpreted the case thus:—In the first place, he thought there had been a fresh haemorrhage into the pericardium. This blood, he considered, had undergone vital changes during the days that the patient lived, among which was the deposit of fibrin, helping to close the opening in the auricle. It seemed doubtful if this auricular wound had been reopened.

*Dr. Macewen* pointed out that the patient was delirious—an indication of sepsis.

*Dr. Gairdner* remarked that there was no evidence of perfectly fresh blood in the pericardium.

*Dr. Coats* admitted that there was not, but said that there was nothing against such a theory.

*Dr. Gairdner*—Except that one would have expected bloodclots evidently recent.

*Dr. Macewen* thought that the presence of pyrexia, and of some pleurisy also, indicated death from sepsis.

*Mr. Maylard* asked if a hole in the auricular wall was found post-mortem.

*Dr. Coats* quoted from the report that a hole admitting the point of a probe was found.

*Dr. Neuman* asked if there were no evidence of sepsis in other organs, even on microscopic examination.

*Dr. Coats* did not think the other organs had been examined microscopically.

*Dr. Macewen* asked Dr. Coats if he thought the patient would have survived if there had been no sepsis, supposing death not to have been from pericardial effusion of blood.

*Dr. Coats* said he would have lived in any case if there had been no sepsis, because then the auricular wound would not have reopened.

**VI. RUPTURE OF THE HEART.**

*By Dr. Joseph Coats.*

The heart was obtained from Dr. Wallace, and had been
removed from a patient who died in Smithston Asylum, Greenock. The description of the organ is as follows:—

The heart presents, at the apex of the left ventricle, a small aperture with a clot in it. On dividing the ventricle it is seen that this aperture passes into irregular torn spaces in the sub-pericardial fat, and on through a tear in the muscular wall into the left ventricle at its apex. The apical part of this ventricle is occupied by a coagulum which has the aspect of a comparatively recent but probably ante-mortem clot. In this region the muscular tissue has a softened appearance and a brownish colour which extends slightly up the ventricle, and presents a distinct line of demarcation. The posterior wall of the ventricle was occupied by a very marked tendinous patch of considerable size and great toughness. The appearance of the apical part is that of the condition named myomalacia cordis.

The coronary arteries generally present frequent patches of atheroma, and on opening up the branch leading to the apex of the heart, it is found obstructed by a comparatively recent thrombus. Another of the descending arteries leading to the large tendinous patch presents an atheroma which almost obstructs the calibre.

Microscopic examination in the apical part of the ventricle shows great atrophy of the muscle, whose place is not yet taken by fibrous tissue. In some places the sarcolemma is still visible, and occasionally contains brown granular masses, but is generally occupied by polygonal nucleated cells. Around those parts where the muscle is gone there are areas where the cylinders are preserved, but the nuclei insusceptible of staining. Between these cylinder collections leucocytes are often visible.

Dr. Coats remarked that this was a case of myomalacia cordis and rupture occurring in consequence of obstruction of one of the coronary arteries. The tendinous patches in the wall of the heart showed that there had been considerable obstruction of older date. The more recent obstruction had produced infarction of the apical part of the heart, and the blood from the ventricle had worked its way outwards till it penetrated the whole thickness.

Dr. Coats remarked that rupture of the heart seemed to be frequent in asylums. He had received several specimens from Gartnavel, through the kindness of Dr. Yellowlees. This specimen was from Smithston, and Dr. Buchanan had another specimen to show, also from an asylum.
VII.—CASE OF RUPTURE OF THE HEART.

BY DR. R. M. BUCHANAN.

Dr. Buchanan showed a heart bearing a very close resemblance to that just shown by Dr. Coats. There was in it, also, atheroma and thrombosis of the coronary arteries, and in it, too, the same branch had been occluded, giving rise to coagulation necrosis and to a rupture of the heart, the rupture taking place in the middle of the wall of the left ventricle, near the septum. The specimen was obtained from Gartnavel.

ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

SURGERY.

BY HENRY RUTHERFURD, M.B.

Intussusception.—Senn has published a valuable paper on this subject, largely statistical, but with details of many special cases in the hands of different operators. He urges the prompt performance of laparotomy when, after a fair trial, inflation with hydrogen gas or air (filtered) has failed. There seems, both on the a priori ground of greater elasticity and on the basis of experiment, reason to believe that gaseous distension is less apt to do damage (by rupture) than the distension of the bowel by water. As to the superiority of hydrogen on the ground of asepsis and inhibition (antiseptic) action, the writer’s claims are perhaps less self-evidencing.

Colostomy or enterostomy, as the case may require, are only to be done when the state of the patient precludes abdominal section. Abdominal section will usually be best performed by a median incision.

The results of abdominal section are distinctly worse in the infant, but so are the chances of recovery by sloughing and separation of the intussusceptum; therefore, the indications for operation remain the same. The youngest successful case is that of an infant of six months, operated on by Sands (New York Med. Journ., June, 1887), where inflation had been only partially successful. Godlee had a successful case aged nine months (Lancet, 16th December, 1882). An interesting case in point of duration is that of a child of two years, reduced after operation by Mr. Hutchinson, after having been in process for one month. After opening the abdomen, the first step towards reduction, it is pointed out, is the diminution of bulk of the edematous intussusceptum by steady compression; this is to be made with the hands over a sponge. A flat director may then be passed between the peritoneal surfaces to separate adhesions as much as possible. Traction may be aided by inflation.

If the invagination cannot be disengaged, various procedures may be adopted for re-establishment of the intestinal circulation:—(1) Total resection of the cylinders involved is a very severe operation; further, it involves the sacrifice of a great extent of intestinal surface. (2) A lateral apposition may be performed between the portions of bowel above and below the seat of...
obstruction, leaving the intussusception in situ to become reduced or to slough more probably. (3) The intussusceptum may be opened just below its neck (and the condition of the neck is a point of primary importance in determining what shall be done with it), and the contained cylinders resected. This resection may be done rapidly with elastic ligature, and then a lateral apposition done, or the two cylinders may be stitched together above the point of section. An operation on this plan was successfully performed by Mickulicz in a case of colico-rectal invagination, the parts, however, being protruded at the anus, and not having to be reached through abdomen and intussusceptum.

—(Reprint. The Bryant Co., Toronto. 1891.)

Atrophy and Growth of Bone in Relation to Pressure.—
Julius Wolff reviews the various theories on this subject which have been put forward within the last fifty years.

Fick claimed that the phantom of any self-determining force or organo-plastic idea, as influencing the forms of the bones, must be got rid of. The bones were to be regarded as "passive organs," whose form was determined by the so-called "active organs," the muscles, nerves, &c. This influence being exerted by the activity of these latter, but by their mere existence, their localisation, and greater histoplastic intensity.

Virchow recognised the importance of both pressure and traction as exercised by the muscles upon the form of the bones; further, he insisted upon the existence of changes in the internal structure even of the fully formed bones, but these changes he considered to have nothing to do with alterations in the form and proportions of the bones. Volkman, in the year 1862, first pointed out that the internal processes already appreciated by Virchow had an equal importance in respect to the external form of the bones. He called attention to the occurrence of senile and traumatic absorption of the neck of the femur, to the bending and displacement of the joint surfaces in arthritis deformans, to atrophies of whole bones or portions of the skeleton, with the body cavities enclosed by them, and maintained that these things were explainable only on the supposition that bony tissue is capable of expansion, compression, bending and shrinking.

The elasticity of the bones in combination with a local metabolism proportionate to the tension at which the parts are kept by the pressure, is capable, according to Volkman, of bringing about slowly the most considerable alterations of form in the bones. In short, under the influence of pressure, processes of absorption are set up in the interior of bone.

A development of this thesis was set forth by Volkman and Huetter in the law enunciated with respect to the growing bones of youth, that not merely is restricted growth a result of increased pressure, but that the growth of bone is increased where the bone is subject to a relief of pressure in an abnormal manner, or where it is actually subject to traction.

This pressure theory Wolff denies, upon (1) mathematical, (2) anatomical, and (3) clinical grounds.

1. It has been a common error to suppose that the point of application of a weight is the point where, in an elastic structure, its action is greatest. That this is not so is illustrated by an analysis of the distribution of weight in the femur.

2. As a matter of fact, not atrophy, but growth of bony substance results from increase of pressure, or traction and atrophy from diminution of these.

3. The development of deformities in the contour of the bones is in direct relation to pathological alterations in the static necessities of the bones.

The static usefulness and necessity, or the static superfluousness, and these alone decide as to the existence and locality (Oertlickkeit—fitness?) of each individual particle of bone, and accordingly as to the form of the bone as a whole.

Apposition, interposition, shrinking, wasting (Marsenschwund), expansion, and absorption, all these things, by which the form of the bone can be altered, are nothing but the separate individual processes by which, at different periods of life, and in different localities under normal conditions, and in the altered
static demands of pathological conditions, is manifest to us the activity and functional co-ordination of the bony framework.

"Es ist der Geist der sichden Körper baut."—Schüller.

—(Arch. für Klin. Chir., xlii, 2.)

Wounds of the Ureter in Laparotomy.—Pozzi reports a case where the right ureter was torn across in the course of removal of a retroperitoneal ovarian tumour, that is which had dissected up the layers of the broad ligament. As the lower end had been separated from its connections for a considerable distance, it did not seem wise to attempt to reunit the extremities. The lower end was closed, being, however, brought out of the abdominal wound, so as to be under observation, and the upper end was taken out through a lumbar incision. At the end of three months lumbar nephrectomy was done with satisfactory result. Pozzi points out the undesirableness of complicating an ovariotomy with immediate nephrectomy.

In case of a simple wound of the ureter without destruction of tissue, it has been recommended to suture the ureter, as in wound of the bowel, and to introduce a ureteral catheter. Pozzi, however, thinks that this is unnecessary, and that the point to attend to is that the wound of the ureter shall be thoroughly isolated from the peritoneal cavity, and provision made for any possible leakage from the ureter. Where the ureter is torn clear across, he would treat in a similar manner—that is, where there is no stripping up of either end from its connections. A case of this kind was reported by Schopf in a case of operation for intraligamentous cyst. Eight points of suture were used. The operation seemed to have succeeded for the first four weeks, then came accidents which carried off the patient in less than two months.

Gussow tied a ureter with a portion of tumour tissue at the bottom of the wound in removal of a malignant tumour of the broad ligament. On the eighth day there formed an abscess, with septic peritonitis, which was fatal.

Pozzi does not, in this communication, deal with cases in which the ureters had been ligatured in removal of the uterus; he only refers to it as an accident overlooked, which may explain some deaths attributed to shock.—(Annales des Mal. d. Organes Genito-Urinaries, August, 1891.)

DISEASES OF THE SKIN.

By Dr. A. NAPIER.

Raynaud's Disease; Thrombotic Warts.—A good example of the hereditary form of Raynaud's phenomena is recorded by Mr. Jonathan Hutchinson. The patient was a girl of twenty-four, and since childhood her hands were habitually dusky, and the fingers very liable to "die." A peculiar feature of her case was the formation of little "thrombotic warts" on the sides of the fingers, especially on the index. These consisted of little elevations or thickenings of epidermis, from the size of a pin's head to that of a large shot, and were of a deep purple tint.—Brit. Med. Journ., p. 9, 4th July, 1891.

Electrolysis for Scleroderma in Bands and in Plaques.—Dr. L. Brocq treated by electrolysis a patient affected with a band of scleroderma which extended from the right arm to the thumb. He gave him in all fourteen séances of twelve to sixteen punctures. The affection was arrested, and has not since increased. Treatment was interrupted during August and September, but the plaque did not increase, thus proving that it is not necessary to have the séances close together.—(Journ. of Cut. and Genito-Urinary Dis., No. 102, 1891.)

True or False Argyria.—A remarkable case of supposed argyria was shown to the London Post-Graduate class by Mr. Jonathan Hutchinson. The
patient, a man of sixty-three, presented a tolerably uniform deep leaden colour of his face, neck, ears, and scalp. The same tint extended over the whole trunk and limbs, but was much less marked on the covered parts. The mucous membranes of the eye and mouth were also deeply discoloured. The colour was everywhere exactly like that of lead, and the general appearance resembled that of a patient who had taken nitrate of silver in excess. It was not "bronzing" but "black-leading." One result of the discoloration was that all the hair-follicles on the skin were made very conspicuous, as the tint was deepest just around their orifices. The same was seen very conspicuously on the palate, where all the gland-orifices were picked out in black. Mr. Hutchinson brought the case forward as an example of a condition exactly resembling that of the deepest possible nitrate of silver staining which had yet been produced without any such cause. The man had always denied having ever taken the drug named. He had, however, at the last moment, and whilst before the class, remembered that, at least thirty years before the change in the colour of his skin attracted attention, he used for a year continuously a gargle which he was told contained nitrate of silver. Speculating on the diagnosis, Mr. Hutchinson said the case in all its features exactly resembled nitrate of silver staining. The question was whether, either in the manner which the man himself suggested or some other way, nitrate of silver had been received into the system; or whether there was simulation of argyria under the influence of a totally different cause. If the man's own suggestion were accepted, we then had the remarkable fact that the colouration of the skin had not been noticed until a long period of years after its use. Mr. Hutchinson avowed his own belief that the case was one of argyria. He could not conceive that any other cause would so closely simulate its appearances.—(Brit. Med. Journ., p. 9, 4th July, 1891.)

The Local Treatment of Eczema.—Mr. Leslie Roberts, writing on this subject, says that the first rule is in every case to reproduce the conditions of the healthy skin. Rest is therefore the first indication; and when the horny cells are destroyed, some air-excluding substance should be put in their place. Powders such as starch, lycopodium, bismuth, or zinc oxide may be used with this object. The agents which promote the formation of cuticle are those which have affinity for oxygen. Sulphur, resorcin, chrysarobin, pyrogallic acid, beech and juniper tar, are the agents from which choice will have to be made, according to the amount of work required to be done. When the eczema is moist, a thin paste is preferable to a thin ointment, as it has more adhesiveness. Over parts where there is much friction a bandage should be applied; or a varnish, such as the liquid thiol or ichthyol, may be substituted. —(Liverpool Med. Journ., July, 1891.)

Arsenic in Relation to Skin Disease.—In a lecture on arsenic as a drug, delivered as part of the London Post-Graduate course, Mr. Jonathan Hutchinson records his long experience of this remedy in affections of the skin, against certain kinds of which arsenic appears to possess specific powers. In all instances of pemphigus but exceptional cases occurring in elderly subjects, and those which are complicated by disease of the mucous membrane of the mouth, no fresh bullae appear after arsenic is given. Similarly in the treatment of common psoriasis the effect of arsenic, although not nearly so immediately curative, is quite as definite and certain as in pemphigus. It seldom or ever, however, brings about a complete cure. Both its efficiency and its safety are in ratio with the youth of the patient. If given in anything like full doses, arsenic usually irritates, and makes eczematous eruptions worse. Speaking of the long-continued administration of arsenic, Mr. Hutchinson pointed out certain symptoms which ought to lead us to take alarm. If the patient has numbness and tingling in the palms and soles, or if there is decided loss of flesh, then it ought to be suspended. The well known symptom of disagreement, irritation of the conjunctiva, is not, in Mr. Hutchinson's experience, so frequently observed as some of those just mentioned. To these must likewise
be added liability to diarrhoea, and sometimes to irritability of the bladder. Allusion was made to the fact that arsenic, whilst curing some diseases, produces others; and that herpes zoster is one amongst several different type-forms of peripheral neuritis which may indirectly result from its administration. It seems to possess some peculiar affinity for nerve-tissue, and some peculiar influence upon nerve function.—(Brit. Med. Journ., p. 1213, vol. i, 1891.)

Treatment of Pruritus Hiemalis.—Corlett states that in the treatment of pruritus hiemalis locally, resorcin has been found the most beneficial drug. It tides over the irresistible desire to scratch; its influence remains from two to five hours; and not infrequently it affords immunity for a whole night.

The following is the formula used:—

B. — Resorcin (Merck), ....... 3i.
Glycerini, ....... 3ij.
Aque, ....... ad 3iv.

Sig.—Apply.

Menthol has also been serviceable in this affection:—

B. — Menthol, ....... 10 p.c.
Glycerini, ....... 3ij.
Aque, ....... ad 3iv.

Sig.—Apply.

Ichthyol, although less agreeable to use, has been highly beneficial in a few cases:—

B. — Ichthyol ammon. sulph., ....... 3—10 p.c.
Glycerini, ....... 3ij.
Alcohol, ....... 3a q. a. ad 3iv.
Aque, ....... 3iv.

Sig.—Apply.

These applications have been called palliative, yet it is not very uncommon to see cases of pruritus hiemalis get well under their use. Change of climate seems to be the only curative means at our command; but as few patients are able to avail themselves of this, it must ever be of secondary importance. From the foregoing it will further appear that in selecting a climate, one not subject to sudden changes should be chosen. Warmth and humidity are also essential.—(Journ. of Cutan. and Genito-Urin. Dis., No. 101, 1891.)

Angiokeratoma of Hands and Feet.—Dr. J. J. Pringle directs attention to a rare affection of the skin, denominated angiokeratoma; and publishes extensive notes on a case occurring in a fine-looking well-nourished girl of 24. The patient's digestion and menstrual functions were normal, and the temperature curve normal. There were no indications of venous obstruction, nor of vascular degenerative changes; neither was there evidence of ill-balanced peripheral circulation. Up to the age of 15 she had been subject to chilblains at the four extremities. At that age she noticed dark spots on her hands and feet. She continued to suffer from chilblains up to the age of 20, each attack being followed by fresh dark spots, none of the previously existing ones having ever disappeared. On coming under observation her condition was as follows:—All the lesions were situated in the dorsal aspect of the hands. They affected the left more than the right hand, but were on the whole symmetrical. None were present above the curve of the metacarpophalangeal articulation, excepting along the ulnar side of both hands. The simplest eruptive elements consisted of tiny, almost imperceptible, pink points, not altered by pressure. On the left hand half a dozen spots were found over
Diseases of the Skin.

the proximal phalanx of the thumb, averaging from the size of a pin's point to a pin's head; they were of a darker colour than the pink specks, and situated in the true skin. On pressure, or stretching the skin, they lost a good deal of their colour at the periphery, but a central deep red point—a teleangiectasis of a capillary loop—remained in all. Over the proximal phalanges of the index and middle fingers similar lesions were numerous, there being also a few over the middle phalanx of the ring finger. A new feature of the eruption, however, was perceptible over the proximal phalanx of that finger—the little, blood-filled, angiectases being clustered together here and there in small, irregularly outlined, slightly raised groups. The same of the severity of the condition was present over both proximal phalanges of the little finger and the distal fourth of the fifth metacarpal bone. The composite lesions here were rough on the surface, hard, and warty-looking. Pressure deprived them of their dull purplish-brown, erythematous tint, and revealed, even through the thickened epidermis, the existence of numerous adjacent teleangiectases. The right hand was less severely affected, but the symmetry of the lesions on the two sides was very striking. No fluid, except blood, issued on pricking even the most warty of the growths. The condition of the feet was exactly parallel to that of the hands, but more severe. The case was shown at a meeting of the Dermatological Society as one of "Teleangiectasis of hands and feet with warty growths."—(Brit. Journ. of Dermatol., p. 239, August, 1891.)

Tylosis Palmaris et Plantaris.—A case of this rare condition, occurring in a married woman of 56, is recorded by Dr. Radcliffe Crocker. For eight months previous to her coming under observation she had suffered from severe and almost universal pemphigus. The disease began with itching all over the body. Up to two months before leaving the hospital her skin was quite dry; "nothing would make her sweat." She then began to sweat profusely, and the skin covering the palms and soles began to thicken. She looked worn and thin, and had lost flesh, and the whole body was thickly covered with erythema patches of a bright red colour, and mostly of a circinate form. A year later, or 18 months after the first appearance of the condition, the intervals between the patches were very small on the trunk, while on the legs they were practically free, but there were none on the face. From subsequent observation these patches proved to represent the sites of previous bullae. Numerous bullae, from a pimple to a pigeon's egg in size, were present on the trunk, and a few on the limbs; some were in irregular groups, some were scattered about singly. The bullae were quite tense. The eruption was attended with intense irritation, coming on in paroxysms. She perspired profusely. Her palms and soles were in a condition of extreme epidermic thickening.—(The Brit. Journ. of Dermatol., vol. iii, No. 6, 1891.)

Zona in Diabetes.—Though there have been many injuries and disturbances of the nervous system recorded in diabetes mellitus, it still remains a matter of debate, in Professor Vergely's opinion, how far they are to be attributed to a central and how far to a peripheral origin. In the cases of neuralgia, it has been held that the absence of local heat and vesicular eruption excluded all idea of neuritis. Some good authorities, among whom were Ziemssen, Charcot, and Buzzard, did not agree with this, but the first adequate pathological demonstration of the effects of neuritis on the diabetic nerves was made last year by Dr. Auché of Bordeaux. The myeline was seen to be vacculated and broken up, the axis cylinder had disappeared. The clinical symptoms had been sometimes oedema, sometimes glossy skin, perforating ulcer, malnutrition of the nails, and even gangrene. But among them zona had not been mentioned, and zona was almost certainly the result of a neuritis. The parasitic theory of its origin, which Dreyfous and Letulle, following Landouzy, had put forward two years ago, had been imperfectly supported, and it was necessary to reconsider the constitutional conditions of its origin. It was very rarely referred to as associated with diabetes in the
special essays on either complaint. Professor Vergely brought forward two cases of diabetes mellitus in which it had been a marked feature, and which had been under long observation. The first was a man, aged 54, of powerful build and healthy history and habits. In middle life he began to get uncomfortably stout, and some sugar was noticed in his water. In May, 1881, he had sharp neuralgia of the right side of his forehead, which was followed by a well marked eruption of frontal herpes, which, for at least ten days, gave acute burning pain, and left deep scars along the course of the left supraorbital nerve. The skin in this region thickened, and became gradually insensitive to pain, though remaining normally sensitive to touch and temperature. The amount of glycosuria did not greatly increase, but was complicated with albuminuria; all food was rejected; and the patient gradually sank into a uremic condition, and died of exhaustion. The second case was that of a woman of 43, who had lived an active life, of good health till about 37, and since then had had much mental distress, and had begun to show signs of diabetes. When the percentage of sugar had become considerable, she got an acute neuralgia in the lesser right sciatic nerve with an abundant eruption of zona. The scars which were left were distinctly more sensitive to touch and to pain. As to what may be the temporary or permanent effect of the eruption on the secretion of sugar, and the best means of prevention and cure, we have still much to learn from wider observation.—(Le Progrès Méd., p. 217, 20th September, 1891.)

DISEASES OF THE EYE.

By FREELAND FERGUS, M.D.

Glaucoma and Affections of the Optic Nerve is the subject of a very long paper by Prof. Schweigger in the current number of Knapp's Archives. He begins with Von Greife's statements:—"In some cases which have been diagnosed as glaucoma after an ophthalmoscopic examination only, there was no external indications of the glaucomatous condition to be found. The alteration of the nerve itself constituted the only evidence of the disease." And again—"The optic nerve affection alone is not sufficient to warrant a diagnosis of glaucoma; in many instances it has a pathogenesis entirely distinct from the latter disease."

He next quotes Hoffmann's views, published with the approval of Donders, that where there is glaucomatous cupping, there must be, if properly looked for, increased tension. Schweigger is of opinion that increased tension and glaucoma are not identical conditions, and calls in support of this view the fact that increased tension is sometimes seen in iritis, and that there are cases of most complete glaucomatous cupping in which there is no increased tension, as is admitted by all. Moreover, the author thinks that where the typical cup is seen, the observer is apt to find subjectively an increased tension which is not an objective reality.

"The weakest evidence of all is the 'typical' excavation. Every excavation which reached the papillary margin was without more ado set down as glaucomatous, and every case which Von Greife was careful to specially designate as amaurosis, with optic nerve excavation, was labelled glaucoma simplex."

Schweigger then describes at some length the anatomical characters of the physiological cup, and says that in elderly people, when the retina has lost its transparency, such a cup is apt to be mistaken for a pressure one, especially if it has been large to begin with, and if there has been any atrophy. The differential diagnosis is by no means certain; but, when it is not a glaucoma, the visual acuteness is generally normal except in cases of atrophy, and the field of vision is not restricted.

The position of the lamina cribrosa is also of importance. In atrophy, with cupping, it generally lies in the choroidal plane; in glaucoma it is
considerably behind this. "If this be true, there is no such thing as a
typical excavation due to intra-ocular pressure, and when the character
of the excavation is in doubt (especially in bilateral cases), it is not to be
determined by testing the tension merely; all the other symptoms of glaucoma
must be considered. The so-called glaucoma simplex may thus be divided into
two groups:—First, true glaucoma, unaccompanied by marked inflammatory
signs; and second, a diseased optic nerve with a pre-existing physiological
excavation."

When one disc presents the so-called typical atrophy, and the other is quite
normal, then, according to Schweigger, there must be glaucoma.

Some of his cases are of great interest. He records one in which the blunder
was made, and a sclerotomy performed. Schweigger thinks that the fact that
vision had remained stationary for several years puts it beyond the category
of glaucoma.

Schweigger evidently does not believe in the filtration angle theory of
glaucoma, and quotes the time-honoured example of glaucoma in aphakia.
While, personally, we have always held Mr. Priestly-Smith's views as explain-
ing the large majority of cases of this disease, all the more so since Mr. Collins'
researches on glaucoma in aniridia, yet we can conceive that the filtration
angle may, after cataract extraction, be blocked by inflammatory processes in
the tissues of the canal.

He places little diagnostic value on the presence or absence of halos. Although
these most commonly occur in glaucoma, still they are not unknown
in other conditions. The cloudings of the cornea, which our author believes
to be due to inflammatory cedema, is not regarded as of any special diagnostic
value.

Of more importance for the diagnosis of glaucoma is the dilated pupil. "It
rarely happens that the pupil is enlarged and at the same time round and
perfectly movable." Again he says—"Whenever we find the pupil fixed—and
widely dilated, we may feel sure that the eye has been subjected to severe
attacks of increased tension."

The presence of arterial pulsation is certainly very suspicious of glaucoma.
It depends on the vitreous pressure at the cardiac diastole reducing the size of
the blood-vessels because the blood pressure is low. It sometimes occurs apart
from glaucoma, but is a most suggestive sign.

The characteristic sign is the cupping of the optic disc; but total blindness
may take place as a consequence of glaucoma without the formation of any
excavation. Schweigger, unless in certain circumstances, does not take the
cupping itself as characteristic of glaucoma. Stress is laid on contraction of the
medial part of the field of vision as indicative of glaucoma; but the
diagnostic value of the halo glaucomatosus is said to be small.

In our author's opinion the inflammatory symptoms of glaucoma are not the
cause but the consequence of glaucoma. This was well exemplified in a case
in which Rydal watched the disease developing. The ciliary injection and
other signs of inflammation came on after the increase of tension.

Schweigger believes, as indeed no one denies, that the ciliary body is the
locality in which the sympathetic secretion takes place. He says—"It is
possible that the first onset of glaucoma may be a very severe one, and
attended by disastrous results; but, as a rule, the disease is ushered in by a
number of separate mild and transient attacks. The picture of a glaucoma
simplex with a slowly increasing intra-ocular tension, creeping on to blindness
without variations in its signs and symptoms, is a purely fanciful one."

As to treatment, he has but one advice—"As soon as the existence of
glaucoma has been demonstrated, iridectomy should be performed at the
earliest opportunity."

As to the relative values of iridectomy and sclerotomy, our author has no
doubt "we may count upon a favourable result following iridectomy with
almost perfect certainty; while sclerotomy, on the other hand, is by no
means an infallible remedy." Several cases are quoted in support of this
opinion.
Again, hydrothalmus is regarded as a glaucoma, and therefore should be treated as such—viz., by iridectomy. In hemorrhagic glaucoma, if there have been fair vision before the onset of the hemorrhage, then an iridectomy should be performed in the hope of restoring the vision to what it was before the hemorrhage.

The conclusion of this paper is taken up with a criticism of Leber's filtration angle theory, a theory which has received very strong support from Priestly Smith in this country.

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