The Pathology and Treatment of Stricture of the Urethra. By Henry Thompson, F.R.S.E., M.B., London. 8vo. 1854.

The subject of stricture of the urethra, at all times one of the greatest interest to the practical surgeon, has of late years attracted special attention in consequence of Mr Syme's proposal, of a new method of treating certain aggravated forms of the disease by external incision, which has led to much controversy on the subject. Those who have paid much attention to the various opinions advanced must have often felt that many of the controversialists who grounded their views upon great experience in treating stricture seemed to forget that such experience was, after all, generally limited to the use of some one special plan, and hence it has long appeared to us desirable that the subject should be thoroughly investigated as a whole by some independent and candid observer. It seems also as if it had been the object of the College of Surgeons of England to obtain such an investigation by making it the subject of their Jacksonian Prize for 1852. In the book before us we have an answer to the appeal; and one which we consider of such importance that we intend to examine it at some length.

The work commences with an inquiry into the anatomy and functions of the urethra and of the various textures with which it is in relation, a thorough knowledge of which, as the author justly observes, is essential to enable the inquirer to arrive at truth in reference to many disputed points in the pathology and treatment of diseases of this organ. Mr Thomson seems to have devoted considerable attention to this important preliminary inquiry, and to have been at great pains, both to make himself acquainted with the observations of others, and by repeating and varying these investigations himself, to render it as complete as possible.

The points to which attention is specially directed are,—1st, the measurements of the urethra, its structure and divisions; 2d, the structures connected with it which determine, to some extent, the form, position, and general direction of the canal, or which, under certain conditions, may affect its calibre. With regard to the measurements of the length of the canal, Mr T. gives the results of the examination of the urethra in sixteen adult male subjects, in which the measurements were carefully conducted by himself. The average measurements in these cases are:
"Total length, from anterior border of uvula vesica to meatus urinarius externus, \(8\frac{1}{2}\) inches.

Dividing the canal in the usual manner into spongy, membranous, and prostatic portions, we have—

| Length of spongy portion, | \(6\frac{1}{3}\) " |
| " membranous ditto, | \(4\frac{2}{3}\) " |
| " prostatic ditto, | \(1\frac{1}{4}\) " |

"The greatest measurement was 9 inches, the smallest \(7\frac{3}{4}\) inches. Of the 16, no less than 10 presented measurements which did not deviate more than \(\frac{1}{4}\) of an inch from the average, and ranging within \(\frac{3}{8}\) of an inch only; that is to say, between \(8\frac{1}{4}\) to \(8\frac{5}{8}\) inches inclusive."—P. 3.

He then refers to measurements made by Mr Briggs, of the Lock Hospital, on the living subject, and repeated and verified by himself, in which the average length is stated at from \(7\frac{1}{2}\) to \(7\frac{3}{4}\) inches. In noticing the apparent discrepancy between the measurements on the living and the dead subject, he says:

"His (Mr Briggs) experiments were made upon the living subject; and, inasmuch as the practical benefit of these researches must be found in relation to the use of instruments during life, it is confessedly of more importance to ascertain, if possible, the length of the canal in that condition, than after death."—P. 4.

And then he draws attention to the absolute value of both measurements, the one as serving to guide the surgeon in the use of instruments and examination of the passage during life, the other as being necessary for the purpose of giving exactitude to accurate researches into the pathological anatomy of stricture after death. The method employed in the post-mortem measurements of the urethra is one which has been very generally resorted to, and has advantages; but a knowledge of it, we think, will serve to explain the apparent discrepancy of the results in the living and the dead body. We quote his words:

"I have pursued the following course with a considerable number of bodies, which it has fallen to my lot to examine. The penis and bladder having been carefully removed from the pelvis, in the usual manner, the entire passage is laid open along the upper aspect. The parts are then placed, being first moderately extended, upon some smooth polished surface, as on a common earthenware dish, and so permitted to take, by their own elasticity, any form or length, which their component structures may determine."—P. 3.

It will be readily perceived that there are two sources of fallacy in this plan, viz., 1st, the indefinite nature of "moderate extension," for, as our author afterwards shows, a very slight extension will make "great difference in this lax state of parts; but 2dly and chiefly, the urethra being detached from its fascial connections, its curvature is effaced, and the membranous portion, formerly extended between the laminae of the triangular ligament, is relaxed and shortened on itself. The measurements on the living serve to correct these fallacies; but they in turn are liable to objections, and can
never give the definite certainty attainable by careful post-mortem measurement, even as to the whole length of the canal, far less as to the relative lengths of the different portions into which it is divided. The plan which we think the most useful, and one combining the advantage of anatomical precision, whilst at the same time the relations are maintained exactly as during life, is as follows. The prepuce being well drawn forwards over the glans penis, two hare-lip needles are thrust through it near its orifice, and behind the needles a strong waxed ligature is firmly tied so as completely to constrict the prepuce in front of the glans penis. The bladder and urethra are then to be moderately distended with alcohol, injected slowly by the ureter. After the textures have thus been hardened, a careful section of the bladder and urethra can be made without disturbing the natural relations or curvature of the canal, and thus not only may accurate measurements of the whole length be obtained, but the definite length of the spongy, membranous, and prostatic portions, their relations to each other and to surrounding parts, together with their depth from the surface of the perineum, accurately determined. We have made many such sections, and have taken casts from them; in very fresh, firm subjects, the section can be made, as far as regards the urethra, well enough without hardening with alcohol. We may here subjoin the results of our measurements so made.

Measurements of Urethra.

[The measurements were taken by means of a piece of thin waxed cord laid along the canal following its curve.]

I. Measurement of urethra; parts in natural condition, penis resting on right groin.

| Part                        | Measurement                      |
|-----------------------------|----------------------------------|
| Total length of urethra     | 7 inches 11\frac{1}{2} lines      |
| Spongy portion              | From meatus externus to commencement of membranous portion at its entrance into the anterior layer of triangular ligament; 6 inches, 4 lines. |
| Membranous portion          | From its entrance at the anterior to its exit at the posterior layer of the triangular ligament; half an inch, or 0 \(\frac{1}{6}\) inches. |
| Prostatic portion           |                                   |
| Total length                | 7 inches 11\frac{1}{2} lines      |

Measurement of the walls, membranous portion between layers of triangular ligament,

- Upper wall; 5 lines.
- Lower wall, \(\frac{3}{8}\) inch, or 4\(\frac{1}{2}\) inches.

II. Measurements of urethra; penis previously injected with wax, so as to represent the erect condition.

| Part                        | Measurement                      |
|-----------------------------|----------------------------------|
| Total length of urethra     | 9\(\frac{3}{4}\) inches           |
| Spongy portion              | To orifice at anterior layer of triangular ligament; 7\(\frac{4}{8}\) inches. |
| Membranous portion          |                                   |
| Prostatic portion           |                                   |
| Total                       | 9\(\frac{3}{4}\) inches           |
The exact measurements of the width of the urethra are very difficult to obtain; our results can be but approximative. We agree with our author, that the best plan is the old one, of taking casts by filling the bladder and urethra with wax or fusible metal, and so obtaining the width of the canal at different points when dilated by a moderate and equal fluid pressure. In reference to these measurements of width, Mr T. concludes with the following judicious remarks:

"The value of these researches is found in the practical application of the principles which result from them, to the employment of instruments in the urethra during life. Granted that constant relations of size between the different parts of the canal exist, and that the external meatus is known to be, with very few exceptions, the smallest of all; it follows that an instrument which fills that orifice without over-stretching it, must be able to pass through its whole course, unless some obstruction be present. Thus, to some extent, it may be regarded as a key to the capacity of the rest of the canal. As regards the actual average of measurements met with in practice, it is seldom that No. 12 cannot be fairly introduced into the adult urethra, while Nos. 13 or 15 are often admissible. The diameters of these instruments are, respectively, three-tenths and three and a half tenths of an inch."—P. 8.

Our author next proceeds to examine the membranous, muscular, and erectile textures immediately in relation with the urethra, which may affect its condition in reference to examination or treatment. The description given of the perineal fascia is correct enough in its main points in relation to the urethra, but some expressions might mislead. Thus, in describing the two layers of the deep perineal fascia (triangular ligament), Mr T. says,—"The posterior layer becoming thinner at its lower border, subsides into a fascial covering for the levator ani muscle. The anterior is in contact in front with the muscles of the perineum, and its lower border turns forward beneath the transversus perinei muscles to become continuous with the superficial fascia of the scrotum and abdomen, which dips down to join it." Now, this would lead us to understand that the two layers of the deep fascia were distinct and separate at the point where the superficial fascia joins it, whilst, in reality, both laminae of the deep fascia converge and become blended together, forming one structure about four lines in front of the point where the superficial fascia is reflected upwards to join it. That junction corresponds to the base of what anatomists have termed the anterior or urethral triangle of the perineum, and from the point of junction, the ischiorectal layer descends to cover the perineal surface of the levator ani. We think, also, that our author would have done well, even at the risk of a little circumlocution to have incorporated the important anatomical fact mentioned in the foot-note at page 15, into the text, as explaining the real connections of the structures which close the pelvis inferiorly. In concluding his notice of these faciæ he says:

"The important connections of the faciæ can only be sufficiently demonstrated by careful dissection. There are no preparations in our museums which
show them well. But those who have the opportunity so commonly enjoyed by students of the present age, of prosecuting their studies in Paris, will do well to examine, at the Museum of the Ecole de Médecine, the finest series of dried preparations of the genital organs in existence; in which the fasciae especially are most elaborately dissected and beautifully shown.”—P. 16.

Mr Thomson must be better acquainted than we are now-a-days as to the state of the London museums; but, as we understand that he pursued his investigations for some time in Edinburgh, we protest against such a sweeping declaration in regard to our schools. We have ourselves made a few preparations to exhibit these fasciae: one series of these perineal and pelvic dissections, in the possession of Prof. Goodsir, our author might have seen at our university; and our students need not be driven to the necessity of visiting Paris to get a good view of the pelvic and perineal fasciae.

A careful examination of the anatomy of the muscular tissues surrounding the urethra follows, and the mucous canal is shown to be closely connected by its sub-mucous tissue with involuntary muscular fibre in every part of its course, not existing, however, in equal quantity throughout, and at some points interlacing with portions of the yellow elastic tissue. In the description of the voluntary muscles which act upon the urethra, the compressor urethra receives a full share of attention, and our author coincides in the description of Guthrie and Müller, limiting the terms to transverse fibres placed above and below the membranous portion of the urethra, and to the internal layer of circular fibres described by Müller as immediately surrounding the canal. With reference to the perpendicular fibres, described by Wilson as descending from the pubis, he states that, although he has occasionally met with muscular fibres descending from the symphysis to the prostate and urethra immediately in front of it, “these appear to belong to that anterior part of the levator ani called levator prostate.” Repeated dissections of these muscular fibres have led us to very different conclusions, for whilst it is quite true that the description of these fibres by Mr Wilson is erroneous from his plan of dissection, detaching the lateral connection of the muscle, and allowing it to fall inwards, and so assume a perpendicular sling-like form, yet we consider it is nearer the true description than that given by Mr Guthrie. We think the plan of dissection which Mr Thompson deems essential for the proper examination of this muscle is the one of all others likely to mislead as to its true relations and form. He says, “it must be sought in a fresh body, and from the inside of the pelvis.” Now, whilst this plan is admirably adapted for some views of the pelvis, especially for showing the levator ani in its relations to the viscera, it is by no means well suited for exhibiting the compressor urethra; for to see that muscle from this view, the posterior layer of the triangular ligament must be divided, and thus, the natural septum between the compressor and the anterior fibres of the levator being removed, mistakes occur regarding the connections of these muscles which could never arise
were the natural relations maintained. There are very few plans of dissecting the pelvis which we have not tried; we have repeated Müller’s dissections, and modified and planned new views of the pelvis; each plan has its own special advantages; but after much experience, we feel no hesitation in recommending the one subjoined as decidedly the best for exhibiting a connected view of the exact relative anatomy of the structures in the perineum and pelvis.

Description of Dissection.—In dissecting the perineum, after cleaning out the fat from the ischio-rectal fossae, without removing the ischio-rectal or obturator fascia, the superficial perineal fascia should be detached from its lateral connections and reflected backwards. The perineal muscles are to be cleared away so as to expose the crura penis, bulb, the anterior layer of the triangular ligament (deep perineal fascia), and the junction of the superficial with the deep fascia behind the transversus perinei muscles. These parts being left, next proceed to connect the perineal view with the pelvic by a section made as follows:—After division of the soft parts, make the section of the left os innominatum, commencing about 1½ inches external to the symphysis pubis and carried downwards through the obturator foramen, with a slight inclination outwards, dividing the tuber ischi i nearly through its centre, so as to leave a considerable part of the attachment of the great sacro-sciatic ligament; the spine of the ischium is next to be detached from the body of that bone by dividing it at its base with Hey’s saw or bone-pliers, thus preserving the attachments of the lesser sciatic ligament and the natural connections of the levator ani and pelvic fascia at the posterior part of the pelvis; lastly, the complete removal of the left os innominatum is to be effected either by disarticulating it at the sacro-iliac synchondrosis, or by sawing it through externally to that articulation. Of course, during the section, care must be taken to avoid injury of the pelvic fascia or viscera with the saw. The obturator muscle is to be cautiously cleared away, so as to expose the outer surface of the pelvic fascia, its external or obturator layer, and the pudic vessels. When these have been examined, the obturator fascia is to be divided from its attachment to the great sciatic ligament, and reflected upwards when the fibres of the levator ani will be seen. The anterior and posterior fibres of this muscle should be left undisturbed, and the middle portion divided and reflected downwards, or altogether removed. We have thus a view of the exact relations of the levator ani and the pelvic surface of the posterior layer of the triangular ligament, which is now seen to be reflected upwards on the prostate on the inner side of the levator ani, and to be a portion of the pelvic fascia stretched from the ramus of the pubis across to the side of the apex of the prostate, and lying between the levator ani and the perineum. When the dissection has been carried to this point, before proceeding to examine the internal or visceral layer of the pelvic fascia, and the relative anatomy of the pelvic viscera, we should return to the perineum, and by cautiously detaching the
anterior layer of the triangular ligament from its external connections, where it is continuous with a fibrous texture covering the crus penis, reflecting it towards the mesial line, and then by drawing it and the bulb slightly forwards, so as to render the part tense, we bring into view the muscular fibres of the compressor urethrae in front of, or on the perineal aspect of the posterior layer of the triangular ligament; whilst, looking from the interior of the pelvis, we see the anterior fibres of the levator ani lying on the pelvic surface of the posterior layer of that ligament, and bounded on their inner or mesial surface by the reflexion of that layer upwards on the side of the prostate; so that there can be no possibility of confounding the fibres of the one muscle with those of the other.

Returning to the compressor urethrae, our own dissections have shown us that it consists of fibres arising from the lower part of the pubic symphysis, which descend not quite perpendicularly, but with a very slight degree of obliquity, or rather curved direction from without, inwards and forwards. Other fibres from the pubic ramus pass from without inwards with a greater or less degree of obliquity, the most superior being more oblique, while the lowest are nearly transverse, or have even a slight obliquity from without, upwards and inwards; the whole pass forwards and inwards to join the fibres from the opposite side, beneath the membranous portion of the urethra. If the fibres which arise from the pubic ramus be detached from their lateral connection, they fall away towards the centre, and then we have exactly the sling-like bundle described by Mr Wilson, and we see the source of error in his description to depend on his mode of lateral dissection. We are satisfied of this, also, by examining his dissection which is preserved in the Bell Collection of the Royal College of Surgeons here, where the cut ends of the fibres detached from their lateral connections can be seen distinctly, as they are magnified by the fluid and the circular jar in which they are preserved.

In reviewing the functions of some of the voluntary muscles, our author suggests some very ingenious theories as to the functions of different portions of the levator ani, which are worthy of careful perusal and study, although we cannot comprehend how the anterior portion of the levator can have a sphincteric action on the urethra, placed as it is in the angle of reflexion of the pelvic fascia, and having between it and the urethra the whole thickness of the prostate. The sphincteric action occurs, we believe, at the neck of the bladder itself, and the explanation must be looked for either in the arrangement of the muscular fibres there described by Monro, or in the peculiar ring of contractile tissue described by Sabatier, Bichat, Cloquet, and others. Whatever difference of opinion may exist in reference to the exact arrangement of the muscular fibres, we think there can be little doubt that all anatomists and practical surgeons will admit the effect of muscular action on the calibre of the
urethra, especially at the membranous portion, and also the spasmodic action occasionally met with at the neck of the bladder. In treating of the erectile vascular tissue surrounding the urethra, Mr T. points out a very good plan of obtaining a relative view of the depth and position of the bulb; and in describing the general arrangement of the erectile tissue of the spongy portion, he draws attention to a fact often overlooked—viz., that a thin layer of the vascular erectile tissue is prolonged backwards beneath the mucous lining of the membranous portion. He also specially addresses himself to the settlement of the question as to the existence of a septum of the bulb, about which there has been so much unnecessary controversy of late in reference to hemorrhage. He brings the result of several special dissections to confirm his views, and illustrates the descriptions by drawings of transverse sections of the spongy portion at different points. As we think his researches are conclusive, and that his remarks place the matter in its true light, we quote them. After stating Mr Ellis’s description of the fibrous septum passing inwards and dividing the bulb into two lobes, and the opposite statement of Mr Lizzars, who denies its existence altogether, he proceeds to state the results of his own investigations on fourteen subjects:

"On the other hand, its existence has been wholly denied. I have accordingly embraced several opportunities of making transverse sections of the bulb, and can most unhesitatingly confirm the statement that a partition exists, and may sometimes be traced forwards to within two or three inches of the external meatus. It is distinctly seen, in some instances, to be composed of two layers with a faint dark line between them, indicating that the coherence of two bodies in the middle line, to form a single corpus spongiosum, is the typical formation, traces of which were present in all the subjects examined to a greater or less extent. The relation of the partition to the fibrous covering of the bulb is, however, not accurately described above; 'a portion of the latter does not project in the middle line,' etc. The partition never appears to be thus connected with the fibrous covering, but is chiefly developed in the interior of the bulb, immediately beneath and closely attached to the urethra, from which point it becomes less marked as it approaches to the circumference, with which I have never seen it to be entirely continuous. Moreover, the posterior part of the bulb receives many more fibrous partitions or prolongations into its substance than any other part of the spongy body.

"It would appear, then, that the relation of structure to the question of hemorrhage stands nearly thus:

"That the entry of the arterial branch of supply at about a half or three-quarters of an inch before the posterior extremity of the corpus spongiosum, renders incisions at this point liable to become the cause of considerable hemorrhage. That the existence of several fibrous partitions in the part posterior to the entrance of the artery, and especially one in the middle line, may tend to render incisions into that part of the bulb so defended, less productive of hemorrhage than in parts where these do not exist.

"But when the difficulty, it may be said impossibility, of hitting the exact line of this slight partition, as may be proved on the dead body, is taken into consideration, it cannot be seriously argued, I conceive, that the prevention of hemorrhage depends upon the accomplishment of so delicate an operation. No doubt but the median line in sections of the bulb is the line of safety; and why? Because a short branch of the pudic enters it on each side, close to which, if an incision be made, the artery might almost as well itself be opened."
But if the section lie equidistant, or nearly so, from the two vessels, the minute meshes of erectile tissue intervening between the section and the artery, entangle within themselves the coagula which are formed, become choked or blocked up, and so conduce most readily to the checking of hemorrhage, more especially if this be favoured by external cold applications."—Pp. 39, 40.

He might have added, in regard to incisions of this part in stricture, that in the cases of firm resilient stricture, generally the subjects of operations, the texture is so altered by consolidation, that its erectile vascular texture is effaced at the part requiring division, and therefore not likely to give rise to hemorrhage. There is one point in the anatomy of the perineum connected with the vascular texture which our author has omitted specially to speak of—we mean the large venous sinuses lying between the layers of the deep fascia returning the blood from the bulb and other deep textures to the great prostatic plexus of veins. A knowledge of this vascular texture seems to us important, not so much as regards hemorrhage, as in some measure explaining the occurrence of phlebitis and pyemia occasionally following operations or injuries at this part. The anatomical section of the work closes with a very excellent summary of the principal facts noticed, pointing out their practical bearings as applied to the diagnosis and treatment of stricture.

The next section of the work is devoted to the classification and pathology of stricture. After defining stricture to be an abnormal contraction of some portion of the urethral canal, and stating his reasons for preferring this more usually received definition to that of Sir Charles Bell, who, considering the urethra in a quiescent state to be a closed canal, defined stricture to be that condition in which it had lost its power of dilating, our author proceeds to range all strictures under two great divisions, Permanent and Transitory. In the former, he ranges all contractions due to organic deposit in or about the urethra, and leading to alteration of structure and permanent contraction of its calibre. Under the head of transitory are included cases where either local vascular congestion, or inflammation, cause a temporary contraction of the canal, constituting Inflammatory stricture, or where the contraction is caused by some unwonted muscular action, Spasmodic stricture. Mr T. makes some very judicious remarks as to the difficulty of any exact classification, as all these conditions may co-exist, as, for example, in cases of organic stricture, where the calibre of the canal may be temporarily still further contracted from the supervision of vascular excitement and spasm, depending on some temporary source of irritation. Passing on to his description of his different forms of organic stricture, we find him thus speaking of the bridle stricture:

"It is not uncommon to meet with folds of the mucous membrane obstructing the passage at one of its sides only; this may occur above, below, or on either side, forming a crescentic septum, obstructing a segment of the canal. Similar folds occasionally run obliquely, instead of directly across it, and two or three such sometimes appear to have coalesced, making the membrane irregular and uneven."
"Such as these constitute the 'bridle stricture' of Sir Charles Bell, a term alluded to here because it has become a rather popular one with writers on stricture, by some of whom it has been supposed to refer exclusively to those rare instances in which a free thread or band of lymph runs across the urethra from one side to the other, as if adhesion had occurred to a limited extent in the centre of the passage, which had afterwards gradually suffered extension, a construction which the original description by Sir C. Bell can by no means be made to bear."—P. 56.

There is no doubt that this description corresponds to that given by Sir Charles Bell, and we believe that those who have understood it as a line stretched across the urethra, have probably been misled by looking at Fig. 5 in Plate v. of Sir Charles' "Engravings from Specimens of Morbid Parts," where the stricture is dissected from the wall of the urethra, and a bristle placed in the canal between the stricture and the opposite wall, giving it the appearance in question. We cannot but think, however, that the term bridle stricture would be better limited to the free thread or band of lymph, whilst the lateral or oblique membranous projections would be better described by the term valvular, for, though the projection is often slight, it very generally presents, more or less, the appearance of a valvular fold. As to the rarity of free bands of lymph, although not common, we do not think they are so very rare as our author's expression would lead us to suppose. We have seen several specimens, and we have one preparation in our possession in which there is a very distinct free band crossing the canal near the bulb, and also one of the valvular constrictions placed laterally.

The pathology of the different forms of stricture is treated of in detail with great clearness. This part of the work contains much useful information, and we would direct attention to the investigation of the essential elements of stricture, and the structures in which the constriction is situated, as well as to the remarks on croupal exudation as a cause of obstruction of the urethra, as being especially interesting and instructive. In reference to that questio vexata, impermeability, our author, whilst he admits that when the canal is narrowed to a mere pin-hole, it may be completely obstructed and rendered impervious from any slight tumefaction or even a little hardened mucus, is of opinion that the canal never adheres or is completely obliterated by disease, except in cases where fistula in perineo exists, and then very rarely, and states, he has once, and once only, met with such a case. Now, whilst we believe that in practice it is well to dismiss the idea of impermeable strictures, as influencing unfavourably our perseverance, and consequently our chance of success in treatment, yet, on the other hand, the question must be fairly looked at in other points of view. 1st, Do we never see the canal so contracted at some points as not to be capable of admitting a No. 1 or even ½ catheter along the contracted passage? 2dly. Do we never find the natural passage completely occluded

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from disease, the urine passing by another route from behind the stricture into the urethra in front of it? The former condition we presume few will deny to exist; of the latter we have in our own possession a specimen where the natural canal is fairly obliterated for about 2 lines a little in front of the bulb, where, from the dilated membranous portion, a small ulcerated opening leads into a new route above the natural canal, and again opens into the urethra in front of the stricture. Abscess in perineo and fistula did occur in this case a few weeks before death (which took place from enormous abscess of the liver), but the obliteration of the urethra evidently had existed for years from its firm consolidated structure; and indeed from our knowledge of the history of the case, we have no doubt that the natural canal must have been impermeable for at least two years. In another preparation also in our possession there is a tight stricture about 3 lines in length in the posterior part of the spongy portion, just wide enough to admit a bristle. On either side of it is a false passage made with a catheter about the size of a No. 2; that on the left side, commencing in front of the stricture, re-enters the natural canal immediately behind it, and leads on to the bladder, and we suspect tight strictures are not unfrequently permeated and the retention of urine relieved in a similar fashion. Such facts show that in one sense the impermeable stricture may be met with, but the cases are avowedly rare; and we repeat that it is well for practical surgeons to dismiss the idea of impermeability as tending to cramp their efforts, and to lead to dangerous operations. The section terminates with an important discussion on the question of the locality of stricture. If any proof were necessary of the value of the preliminary anatomical inquiry, it would be found in contrasting the discrepant statements even of the most eminent and experienced surgeons, who have stated their opinions as to the site of contraction founded on mere general impressions, derived from treating stricture on the living with the clear manner in which the previous exact anatomical description of the urethra enables our author to map it out into regions, and give a simple and definite classification of the parts of the canal most usually affected by stricture. The results of his investigations are as follows:—

"In examining the museums named, I have personally submitted to a close and careful inspection not less than three hundred preparations of stricture of the urethra, of which I possess notes made on the spot of two hundred and seventy, the rest being examples which, from decay or other circumstances, it was impossible correctly to classify.

"These examples may all be comprehended by the three following classes:

"I. Strictures occurring at the sub-pubic curvature, i.e., at the junction between the spongy and membranous portions and its neighbourhood; the latter term being understood to comprise an inch of the canal before, and three-quarters of an inch behind that point, thus including the whole of the membranous portion.

"The junction itself is the point at which stricture is most frequently situated. Next is the extreme anterior boundary of the division, a spot which is one inch
in front of the preceding, and almost as frequently affected; while, between these two points, six examples of stricture are met with for every one behind the junction, in which latter situation therefore they are very uncommon. Most rarely is a stricture found so far back as the posterior part of the membranous portion.

"II. Strictures occupying the centre of the spongy portion, i.e., a region extending from the anterior limit of the preceding, to within two inches and a half of the external meatus, and measuring therefore about two and a half three inches in length.

"III. Strictures occurring at the external orifice, and within a distance of two inches and a half of it.

"The following is an analysis of the 270 preparations referred to; they exhibit 320 distinct strictures:

"Total number of strictures 320.

" in Region I. . . 215 or 67 per cent. on the entire number.
" " II. . . 51 " 16 " "
" " III. . . 54 " 17 " "

320

" Of these—

"There were 185 examples of one stricture only, situated in Region I.
" " 17 " " Region II.
" " 24 " " Region III.

"There were 8 cases in which the urethra was strictered in all three Regions.
" " 10 " " in Region I. & II. only.
" " 10 " " in Region I. & III. only.
" " 13 " " in Region II. & III. only.

"Lastly, I may confidently assert that there is not a single case of stricture in the prostatic portion of the urethra, to be found in any one of the public museums of London, Edinburgh, or Paris."—P. 87.

The chapters on the causes and pathology of permanent organic stricture, and that on the pathology of transient stricture, contain much valuable and instructive matter; but our limits warn us to be brief, and therefore we content ourselves with directing our readers to that part of the work itself, and we pass on to the diagnosis and treatment of stricture.

(To be continued.)
Beyond the region of the heart;" but he does not deny that they may be extensively heard over the thorax. He seems, however, to lay more stress upon this fact of the limitation of the sounds, than authors for the most part do; some estimable writers do not even refer to it. We have certainly seen an erroneous diagnosis made, in consequence of the observer's faith in this rule; of its exact value we feel a difficulty in speaking. We remember in a case of pericarditis to have heard a loud double bruit reaching up to the very top of the sternum, which we certainly put down as endocardial, but which proved to be pericardial eventually, and we alone were not deceived.

The friction sounds are remarkably modified by local antiphlogistic remedies, and by pressure: pressure will at any time produce an increase of the sound, and is therefore useful as a differential means of diagnosis between endo- and exo-cardial murmurs. Dr Sibson first pointed out this fact. As a general rule, there does not appear to be much difficulty in distinguishing between these classes of murmurs; but we must certainly admit the proposition laid down by Skoda, that there is no endocardial, excepting the whistling, which may not be imitated by an exocardial murmur. In the case above referred to, we believe that the finest ear would have found it impossible to decide, from the nature of the murmur, as to its character; certainly we who judged it endocardial were in error. Dr Stokes himself admits the difficulty in specific cases. As for the exocardial being a more superficial and extended sound, such distinction is very dangerous, for a distant endocardial bruit may be louder than an immediate exocardial; and how, as has been asked, by such rule shall we judge of friction sounds arising from the back of the pericardium? Skoda states that the only aid he knows of to assist in the diagnosis is derived from this fact, viz., that endocardial murmurs correspond to the rhythm and natural sounds of the heart, and that exocardial murmurs seem to follow upon its movements.

Some writers have stated that the friction sound disappears when the dull percussion sound indicates much effusion; but this is certainly far from being invariably the case, perhaps it is not the general case, where friction sound had been heard from the first. The sound may be absent when the dulness is great, in certain cases, solely because the effusion is serous, or purulent, and not plastic. It must also not be forgotten that the force of the heart's action is concerned in the production of the murmur; if this be weak, the murmur may be slight, though the effusion be very scanty, and vice versa.

Dr Stokes has collected some interesting facts respecting the modification of the friction sound by the presence of air in the pericardium—pneumo-cardium. This condition must be exceedingly rare; Rokitansky never appears to have seen such a fact. The sounds produced are said to be crackling, gurgling, and metallic. Its rareness renders this condition almost matter of curiosity only. Some of the cases related by authors are of very doubtful character, the
presence of the air being conjectural. We have ourselves, however, witnessed one case; here air escaped from the stomach, through an ulceration in the lower part of the oesophagus, and through the back of the pericardium into its cavity; unfortunately the precordial signs were not observed during life.

Dr Stokes seems to consider that the difference of a friction sound produced by the heart’s action within the pericardium and external to it may be diagnosed, but this really seems very doubtful. A most careful observer remarks: “the murmur arising external to the pericardium exactly resembles the murmur arising within it.” Indeed, as the time of the friction sound within the pericardium must be co-incident with that of the sound without, it seems impossible to distinguish between them merely by this friction sound.

In summing up, Dr S. tells us “that we must depend for the accuracy of our diagnosis on the actual acoustic character of the signs,—on their diffusion or concentration at a point of greatest intensity,—on their being superficial or deep-seated,—on their amount of extension over the thorax,—their double or single character,—their transmission or non-transmission along the course of the vessels,—on the presence and character of the tactile signs,—on their constancy or variability in character and seat,—and on the effect of treatment in their modification.” From what we have already said, we must leave our readers to draw their own conclusions as to the actual value of any of these particular signs. As the rough and general rule, we would venture to say that the double friction sound, in nine out of ten cases, leaves us little difficulty in the diagnosis; the exceptional case will probably not misguide our treatment, though its exact nature may elude our certain grasp.

In speaking of pericardial effusions, and the dull percussion thence resulting, Dr S. does not point out the modifications produced in the sound by the position of the lungs, an important fact in judging of the quantity of fluid. When the lungs are pressed forwards over the heart, a large amount of effusion may produce no alteration in the percussion; and when the contrary holds, a small amount is sufficient to cause a change. Neither does Dr S., in showing how to distinguish this dullness from that caused by pleural effusions, remark the particular form which the distended sac assumes.

We will not follow our author into his account of the vital symptoms and history of pericarditis. There is in it much valuable matter, but perhaps more attention than necessary has been paid to the rare and curious symptoms. He shows how varied the symptoms of pericarditis are, and how little value any particular one possesses. Of the pulse he writes down nine different conditions occurring in this disease. His statements, however, respecting the connection of rheumatism with pericarditis, we must note: The combination of pericarditis with acute articular rheumatism is common, yet the disease of the heart is more closely related to the rheumatic fever than to the inflammation of the joints. The liability to pericarditis is in
direct proportion to the violence and duration of the fever. In apyrexial cases of acute arthritis, the liability to cardiac inflammation is but slight. Pericarditis may arise at any period of the disease, and even precede the arthritis, and every variety and degree of pericarditis occur in connection with acute rheumatism.

There is nothing to delay us in Dr S.’s account of endocarditis. Its idiopathic form is unknown to him; he only knows it as associated with other diseases. Chronic diseases of the valves do not belong here,—they are not of necessity associated with it. Its diagnosis is obscure; the only means we have of discovering its presence is from the production of a valvular lesion; but this means is not inapplicable. He does not believe that endocarditis more frequently exists without pericarditis than pericarditis without endocarditis, as Dr Hope states; its symptoms resemble those of pericarditis, and its association with rheumatic fever is less marked than that of pericarditis.

Chapter 2 is occupied with diseases of the valves of the heart. The key to the pathology of the heart is to be found in the vital and anatomical conditions of its muscular structure. No matter what the affection, its symptoms mainly depend on the strength or weakness, the irritability or paralysis, the health or disease of the cardiac muscles. The nature of a valvular lesion, and its localization, is of comparatively trifling importance; the grand practical points to be determined are: is the murmur heard organic? what is the condition of the muscular fibre of the heart? The cases where it is desirable to fix the exact seat of the disease are few, for our treatment must be guided by the condition of the muscle. In prognosis the question may be of more importance, in this respect, that there is a greater probability of sudden death, for instance, in mitral than in aortic valvular disease.

Discussion of the causes of the heart’s sounds, our author wisely refrains from. He says, with truth, that observers have taken too limited a view of their possible causes, and shows that no less than twenty-two operations are associated with these sounds—eleven for each side of the heart. Certainly pathology justifies us in saying this, that though some parts of the heart take a leading share in the production of the sounds, that these cannot be ascribed to any single cause. At present we must be content to know, for practical purposes, that the first sound and the systole, the second sound and the diastole, are respectively coincident. Wisely, also, does Dr S. warn him, who thinks to find disease at the bed-side, as he finds it described in his books. Rules of diagnosis are too often founded on the supposition of the isolation of diseases, but its combinations vary infinitely, and these must the physician’s view embrace. Compared with these, the seat and nature of the murmur is as nought. “He will examine into the vital and mechanical state of the heart’s cavities. He will ascertain the amount of vigour of the heart,” etc.; the duration of the disease, and its origin; and what effects have been produced by the disease upon the brain, lungs, or liver. Dr
S. agrees with M. Forget, that we have only probability to guide us in determining whether a murmur exists on the right or left side of the heart. It is not safe, by referring to the points of the greatest intensity of the murmur, to attempt to fix its seat. This doctrine he has taught many years.

Absence of murmur is no indication of absence of valvular disease, just as the presence of murmur, per se, is no sure sign of its existence. Mr O'Ferrall, in well observed cases, has marked the disappearance of the murmur, with progression of the valvular disease. Of this fact, and of its importance in practice, there can be no doubt; in the last stages of heart diseases, when the general symptoms are well marked, and the heart's beats tumultuous, irregular, and feeble, and the malady of long standing, we have often had occasion to verify its truth.

But our author speaks of a latency of valvular disease. This is a slow and disorganizing process, which for years may reveal its effects neither to the patient nor to his physician; producing neither signs nor symptoms of heart disease, and yet, as it were suddenly, in the course of a few days, manifest signs of valvular disease will appear. But this is no acute disease, and disastrous often are the consequences to the patient, when it is considered and treated as such, which unhappily it too often is. On this fact he lays great stress. Many interesting cases illustrative of the compatibility of an active existence with a highly advanced condition of valvular disease are also recorded by him. Nobody can dissent from the just remark of our author—that in our practical dealings with valvular murmurs, we should consider rather the effects of the disease than the disease itself; it is certain that a vigorous and active life is not incompatible with the existence of certain valvular murmurs, and that these murmurs may endure for years without producing any general symptoms; but we are not quite sure whether he does give their real value to these abnormal sounds. We speak with respect and caution when we speak in the presence of Dr Stokes, but we feel bound to say that our own experience has led us to a feeling of greater certainty in diagnosis both of the seat of the murmur and of its nature, than Dr S.'s appears to have led him, and also, we may add, to more positiveness in diagnosis. Our own belief is, that the cases are very few indeed in which, if sufficient opportunity for examination be given, the physician can err in distinguishing an organic from a functional murmur. We might almost say that Dr S.'s caution in this matter has led him into the opposite extreme. Two cases are related at p. 151, at which, in our opinion, the judgment of the physician as to the organic or functional disease of the heart ought not to have halted. In both the "physical signs were unquestionably those of organic disease of the mitral valves;" in both, the general symptoms appear to have been those indicative of cardiac disease. Why then does our author hesitate? Because, it would seem, the general anaemic condition and the age of the
patients (female), induced him to ascribe the signs and symptoms to anæmia. Now, we feel tempted to ask this question, has any one ever observed a persistent nitral murmur associated merely with an anæmic condition of the body? The thing may be, but we can scarcely hesitate in saying that it must be most rare; hardly in a practical sense, worthy consideration, when all the marked and general symptoms of heart affection co-exist. (There is one auscultatory sign to which we would here allude, as we can scarcely doubt that it would in these difficult cases have been found of every valve.) Our author elsewhere alludes to this sign—increase of the second sound of the pulmonary artery—but it is only for the purpose of rejecting it from consideration. Our experience has given us a very different idea of its value, and we must therefore dwell for a moment upon this point, for it certainly is true that although this increased second sound of the pulmonary artery in certain diseased conditions of the heart, has long been pointed out, and adopted in their text-books as a regularly acknowledged auscultatory sign by Continental writers, it is still but little regarded in this country, and is, indeed, apparently unknown to the majority of observers.

In the second intercostal space, says Hamernjik, about a finger's breadth from the right of the sternum, two sounds, a tic-tac, are audible, and two like sounds at a similar point to the left of the sternum; the first set belong to the ascending aorta; the second, to the pulmonary artery. As a rule, it may be set down, that the sound which corresponds with the heart's diastole, and is heard over its apex, and in the arteries of the neck, is produced by the semilunar valves of the aorta, and that which is heard over the right ventricle, by the pulmonary artery's valves. In healthy persons, these sounds, in respect of strength, pitch, timbre, and duration, are, for the most part, exactly alike, and thus, indeed, they seem to represent but one sound; even in health, however, they present variations in these particulars; thus the pitch, duration, etc., of the pulmonary artery's second sound is sometimes found increased, and often divided into two or three parts. Under the influence of certain diseases, however, a very marked difference is observable. Whatever produces increased tension of the pulmonary artery, produces increase of its second sound, and it may be, its division also into two or three intervals, whether hypertrophy of the right ventricle, obstruction of the mitral orifice, or deficiency of the mitral valves, etc.; at the same time the first sound becomes less clearly defined.

A consideration of these facts at once brings us to this position; that a distinct increase of the second sound of the pulmonary artery, heard in conjunction with a nitral murmur, is almost the certain indication of deficiency or contraction of the mitral valves. One German writer, indeed, of whose name we have heard a good deal lately, goes so far as to say, that we are not to conclude from the
mere fact of a murmur being heard in the left ventricle during the heart's systole, that the mitral valves are defective, unless we at the same time ascertain that there is an increase in the intensity of this second sound of the pulmonary artery.

From our own experience we are not prepared to say that this increased second sound is invariably to be found, corroborative of the existence of disease of the mitral valves, but that it is so in the majority of cases we do not doubt; neither can we doubt but that in the cases mentioned by Dr Stokes, and whose notice has led us into these particulars, the sign would have been found a *pierre de touche*.

Another fact respecting the pulmonary artery, and stated by Hamernijk, is worthy of note. After observing that the vibrations produced by the flapping together of the valves of the pulmonary artery, may be occasionally felt in the second left intercostal space, and close to the sternum, when communicated through lung tissue consolidated by effusions of tubercular, pneumonic, or cavernous matters, he goes on to tell us, "but when the beat of the artery and the flapping of the valves are felt in any other intercostal space, we may be sure that the position and size of the heart, and the condition of the pulmonary artery are abnormal. When the pulmonary artery through any cause, *ex. gr.*, deficiency or contraction of the mitral orifice, etc., has become abnormally increased in length and breadth, it comes in contact with the thorax, and its pulsations are perceptible, but never in the second intercostal space; they are generally to be felt in the third intercostal space, and two or three finger's breadth from the sternum, and even as far as the nipple, and invariably indicate a deep position of the heart.

Our author's practical method of reckoning up the value of cardiac murmurs, as indicators of treatment is excellent, and well worthy attentive perusal. In speaking of diseases of the valve at the right side of the heart, Dr Stokes says, "that clinical medicine does not justify a diagnosis of the disease of the tricuspid or the pulmonary valves." Surely he speaks here too absolutely; a systolic murmur heard loudest over the lower part of the sternum, *i.e.*, over the right ventricle, and associated with swelling and *pulsation* of the cervical veins, would certainly justify us in considering the tricuspid valves defective, especially if no distinct murmur were at the same time audible over the left ventricle and along the aorta. Neither can we admit this dictum:—"If there be a mitral murmur, we lose the sound of the tricuspid valves, and if an aortic, that of the valves of the pulmonary artery." Indeed we must totally dissent from such a proposition, for we believe the cases are very rare where murmurs, either of the mitral or aortic valves, are so loud as to overwhelm the sounds of the tricuspid or pulmonary artery, provided these sounds be sought for at particular spots, *i.e.*, about the lower half of the sternum for the former, and the second left inter-
costal space for the latter. Dr Stokes cannot be doing justice to our present powers of diagnosis when he says, "We have seen how doubtful all diagnostics drawn from the situation and tone of the murmur must be; and hence the element of probability on the one hand, and the association of symptoms and signs on the other, must be our chief guides in determining the seat of valvular diseases."

We consider, also, that he has much exaggerated the difficulty of distinguishing, in certain cases, between the first and second sounds. It is very true that errors are frequently being committed in this matter, but we will venture to say that in the vast majority of instances such errors would be readily avoided, if the observer would feel the impulse while he is auscultating the sounds of the heart—an important aid to which Dr S. does not allude—and if he will only remember that the murmur or sound which precedes the impulse must be diastolic, his chance of error will be but small. It is only when the action of the heart is excessively rapid, and its impulse imperceptible, that any real difficulty can exist.

Mitral valvular disease possesses, our author tells us, no general symptoms by which we may determine its nature; and the difficulties of its physical diagnosis have not been fully stated by writers. "In the ordinary cases of mitral murmur, we cannot say whether the murmur is constrictive or regurgitant," or both together. Cases where the diagnosis may be made with a great degree of certainty, are more often pictured in books than met with at the bedside. We need hardly say, from what has gone before, that these are not our conclusions. We cannot for a moment admit that this subject of diagnosis is in the obscure and hesitating condition to which it has been reduced by our author. It is perhaps true, that in the majority of cases, it matters little what the nature of the murmur may be (provided we have clearly established its origin in actual valvular disease, and its chronic character), as regards the treatment we may be called upon to adopt, for this being of necessity of a palliative character, has more relation to the complications of disorders produced in other organs by these derangements of the heart's structure than to the organic derangements themselves; but whilst so much obscurity hangs over these cardiac diseases, in every point of view under which we regard them, surely it is unphilosophic to reject minute observation merely because it is difficult, and apparently of no immediate avail. Our diagnosis cannot be too particular; so long as it is well-founded, and has positive facts for its basis; and we cannot, therefore, believe that the daily experience of observers in general will lead them to agree in this dictum of Dr Stokes: "That the number of cases in which we are warranted in making a special diagnosis of valvular disease is small." Certainly, in the majority of fatal cases which come under our observation, we should say the reverse of this; the diagnosis is made with tolerable security, and its correctness confirmed after death. Again, if, as is admitted, certain valvular diseases are more rapidly destructive of life
than others; special diagnosis must, at all events, be of no little importance in the matter of prognosis. Take the case of a constricted mitral orifice, and of a simple defect of the mitral valves; a diastolic mitral murmur is of more serious import than a systolic mitral, and our opinion of its results must be therefore more unfavourable, for it indicates very serious disease of the valvular structure; a constricted mitral orifice presents a direct impediment to the flow of the blood from the lungs, telling forcibly upon the function of these organs, and almost invariably permits regurgitation of the blood in addition. On the other hand, we continually observe instances of systolic mitral murmurs, in which little or no injury seems to be thereby inflicted either on the circulation or the respiration. But Dr Stokes would have us believe that there are no distinctive symptoms of disease of the mitral valves, and that it is almost impossible to decide, in the majority of cases, whether a murmur is associated with the systole or the diastole of the heart.

Our space forbids us following our author into the wide field of observation opened by him concerning the diseases of the valves of the heart. The student may therein gather rich stores of original matter; but he will have to think as he passes along, for the work is no text-book, wherein learning is made easy. The study is a difficult one, and our author has not concealed its difficulties. In his recapitulation, he lays down no less than seventy propositions which have a practical importance with reference to valvular disease, and which he believes are the fair deductions to be drawn from the data he has produced. From his particular views respecting the diagnosis of valvular disease, we have expressed our dissent; but his philosophic examination of the consequences and antecedents of these diseases, of their general relations, their wide influence on the economy, their treatment, their value as indicators of treatment, and as producers of secondary lesions, etc., receives our unqualified thanks. The student may herein find a guide, and the physician who has already gained a mastery in these things, will have the means of trying his knowledge, and testing his opinions.

In his third chapter, Dr Stokes deals with the diseases of the muscular structure of the heart; and, first, with its dilatation. Simple uncomplicated dilatation he has never observed. Much obscurity still hangs over the history of this disease, and Dr S. states that, in the present state of our knowledge, it is impossible to explain its phenomena. Its leading characteristics are a weak condition of the heart, associated with pulmonary and hepatic affections. The renal secretion is often interrupted, and a gouty diathesis manifest; but in what relation these disorders stand to each other as cause or concomitants, or as effects, or the expressions of some general disease, yet remains to be shown. Organic disease of the valves here is rare; the two heart's sounds become very similar, and are, like the heart's action, difficult of analysis. The attacks of the disease are paroxysmal, and progressive in intensity. Death gene-
rally ensues from congestion of the lungs. We would just remark, that this state of things appears very similar to, if not identical with, that resulting manifestly from bronchitis and emphysema of the lungs; and we cannot but think that, at all events, in the very vast majority of cases, simple dilatation of the heart (and this is generally of its right side) may be traced to pulmonary disease. Congestions of the liver, kidneys, and abdominal organs follow, almost of necessity, upon obstruction to the blood's passage through the right ventricle. Dr S. would have a gouty or cachectic state of body to be the most common agent in producing these conditions.

In speaking of dilatation of the auricles, Dr S. suggests, that when it is extreme it may be attended by a diastolic impulse; and relates a case (p. 274) which seems to back his opinion. Bouillaud relates a similar one. Of the fact of a diastolic impulse being occasionally felt towards the base of the heart there can be no doubt; but its manner of production is by no means clear. There is, however, some obscurity about Dr S.'s case; inasmuch as the diastolic pulsation was synchronous with the first sound of the heart, we must infer that the word diastolic here relates to the auricle, not to the ventricle; and if so, we think an explanation of the phenomenon may be found in the supposition, that at each systole of the right ventricle blood escaped back through the tricuspid valves into the enormously distended right auricle, and so gave rise to the impulse felt at the right of the sternum.

In this chapter Dr S. gives a very interesting notice of an obscure and rare affection, viz., increased action of the heart and arteries of the neck, followed by enlargement of the thyroid gland and eyeballs. We have had no experience of this disease, and will therefore merely call the attention of our readers to the account here given of it. It appears that in one case the disease was mistaken for carotid aneurism, and the ligature of the artery decided upon; but happily the mistake was discovered in time.

On the subject of fatty degeneration of the heart, there does not appear anything which need arrest our attention. Dr Stokes' experience confirms the views of those who have of late brought this affection more particularly before the notice of the profession.

(To be continued.)

Transactions of the Pathological Society of London, including the Report of the Proceedings for the Session 1852–53. London. 8vo. Pp. 286. 1853.

This Report of the Transactions of the Pathological Society of London is highly creditable to the zeal and activity of its members. It records their labours during the last session, and embraces about
120 observations, illustrative of a great variety of morbid changes. A detailed review is, of course, out of the question, but we propose to direct the attention of our readers to a few of the most interesting facts contained in these reports.

In this volume, as in its predecessors, the descriptions of specimens are arranged according to the system of organs affected. Cases in which the nervous system was diseased are first detailed. This section embraces fifteen observations, and comprehends cases of apoplexy, softening, cancer, and tubercle of the central nervous masses, as well as cases of diseases of the bones.

A singular case is recorded by Dr Ogle (p. 27), in which a man fifty years of age swallowed a large portion of mutton bone, which became impacted in the oesophagus. Suppuration took place, and the foreign body was speedily discharged. He continued, however, to suffer from dysphagia and pain in the neck; when, about five weeks from the accident, he was suddenly seized with paralysis of the upper extremities. This extended to the lower limbs, and a few days before his death sensation also became impaired.

On examining the body, a portion of the oesophagus, one and a half inch in length, was found greatly constricted, and behind it was a large quantity of purulent matter. The cartilage between the fourth and fifth cervical vertebrae was perforated by an ulcerated opening, which passed backwards into the spinal canal. The whole intervertebral cartilage was vascular, and so were the cartilages covering the opposed articulating processes of these vertebrae, and the ligamentous structure surrounding them was entirely destroyed. Opposite to the ulceration of the intervertebral cartilage, the dura mater and other membranes were very much thickened and adherent to each other, as well as to the bone and to the spinal cord in this neighbourhood. The dura mater for some distance was covered by recent soft fibrin. The spinal cord was generally somewhat softened, but for a short distance opposite to the fourth and fifth cervical vertebrae it was almost different, and this was the case also in the lower part of the dorsal region."

It is to be regretted that the morbid structure was not examined microscopically in this case, as we are left somewhat in doubt as to the nature of the softening. It is singular that the lower part of the dorsal portion of the cord was in the state above described, while that immediately above it was in a comparatively healthy condition.

Mr Hyde Salter reports the case of a man who had a deficiency of the middle portion and left hemisphere of the cerebellum. It is thought to be unique, but in one case described by Cruveilhier, even greater diminution of the cerebellar mass existed. It is curious that in this case of Mr Salter, a man aged forty-four, it is said that "he was frightfully passionate, and had long been addicted to masturbation." The same tendency was exhibited in the case of Cruveilhier, and has been supposed to be a powerful argument against the theory of Gall, the sexual appetite being well marked, and even excessive,
whilst the organ on which this instinct depends was greatly diminished in size.

The section on diseases of the organs of respiration is rather meagre, embracing only four cases.

The first case is recorded by Dr Bristowe, and is headed, "Co-existence in the Lungs of Cancer and Miliary Tubercle (?)" (p. 35). There was no doubt of the existence of cancer in the right lung, and cancer was also met with in the liver. The only question was, whether numerous "moderately firm, greyish-white, slightly translucent granules, about as large as a small pin's head," which were met with abundantly in the left lung and the upper part of the right, were tubercular or cancerous. Dr Bristowe comes to the conclusion that they were tubercular; and in this opinion we think that the description he has given of them quite bears him out. But it is to be observed that the tubercle was not making progress; for we are told that "each was surrounded by a patch of blackened, solidified lung structure." It is therefore nearly certain that the tubercular diathesis had ceased (only its effects being left) before the cancerous disease made its appearance.

The same subject is illustrated in another case, where there were cancerous tumours growing from the dura mater and from the periosteum of the spine and rib, as well as "several small masses of yellow, cheesy material, and a few grey miliary deposits, which had the appearance of tubercle," in the apex of the right lung (p. 7). There can be little doubt as to the cancerous nature of the deposit in the first-mentioned localities; but we are by no means satisfied that the deposit in the lungs consisted of tubercle. An elaborate microscopical report is appended, but we must say, that instead of clearing up the point, it only leaves it in greater obscurity. An interesting case of hydatids in the left lung is recorded by Dr Black of Chesterfield; but any account of it would occupy too much of our space.

Under the organs of the circulation, twenty-five observations are recorded.

Dr Hare describes (p. 81) a somewhat rare kind of malformation of the heart, in which the orifice of the pulmonary artery was completely closed, and where the only communication between the right and left sides of the heart was by the foramen ovale, which was open to a very limited extent (1-10th by 1-16th of an inch). The ductus arteriosus had a calibre equal to about the size of a crow-quill, and the pulmonary artery divided normally into its two divisions. The point of interest here is the very small size of the patent foramen ovale, as all the blood must have passed through it into the left auricle.

The other observations under this division include examples of diseases of the valves, of hypertrophy, and of fatty degeneration of the heart, of pericarditis, of aneurism of the great vessels, as well as several cases of malformation of the heart and large arteries.
Among the cases illustrative of disease of the digestive organs is a remarkable example of enlarged stomach, recorded by Dr Miller. This viscus occupied nearly the whole of the abdominal cavity, and was capable of holding ten and a half pints of fluid. The difficulty of forming a correct diagnosis in this case appears to have been very great. The only other lesion of the digestive organs to which we would direct attention, is the condition of the liver in two cases. The first is described at p. 6. The subject of it was a boy affected with caries of the dorsal vertebrae, and tubercle of the right lung and mesenteric glands. "The liver," we are told, "was much enlarged, extended across the abdomen, and weighed 5 lbs. 13½ oz.; it was a good specimen of the scrofulous liver." In the same case the spleen weighed 12½ ounces, and the kidneys are stated to have been "mottled." In the first place, we strongly object to the term "scrofulous," as applied to any condition of the liver. For although there is high authority for its employment, it involves a theory which we believe to be inconsistent with fact, as the same condition of the organ is undoubtedly met with in cases where there is no proof of the existence of the scrofulous diathesis. The liver in this case was, we have no doubt, in that condition to which the German morbid anatomists apply the term speckig, larbaceous, or bacony, and which many pathologists in this country denominate "waxy;" both of these terms being merely intended to characterise the external appearance. We believe that in the above case the spleen and kidneys were in all probability in the same condition, for the little that is stated regarding them would lead us to this conclusion, while it is well known that when one organ is in this state, the others are very frequently similarly affected. Nothing is said of the blood in this case, though the liver, spleen, and mesenteric glands were all enlarged.

The same condition of the liver existed, we have no doubt, in a case described by Dr Quain (p. 261). "The liver," it is said, "which was found to weigh six pounds, was paler than natural, but felt firm and solid. The increase in size seemed (when investigated by the microscope) to be due to hypertrophy of all the elements of which the organ is composed, rather than to a special increase in one. The gall-bladder contained about three drachms of this thin, dark coloured bile." "The spleen measured thirteen inches in length by eleven in width, and weighed five pounds. It felt exceedingly soft and firm, and was of a dark red colour." On examining the blood in this case, leucocythemia was discovered.

The only other class of cases to which we can allude, are some very interesting dissections of the ear, by Mr Toynbee. This is a branch of morbid anatomy to which but little attention has been paid, owing, no doubt, to the difficulty of conducting the examination. To obviate this as much as possible, Mr Toynbee gives some clear directions as to the manner in which dissections of the ear should be conducted, and by attention to these, a little practice
would, we doubt not, render the examination comparatively easy.

We are happy to state that a marked improvement is exhibited in the description of the morbid appearances and cases recorded in this volume. There is far less vagueness and expression of opinion, with more evidence of investigation and demonstration of fact. Histological research is evidently on the increase among the members of the society, and numerous figures indicate the importance now attached to this mode of inquiry. We confidently predict that, if the members continue to pursue their present method of exact and careful description, they must materially contribute to the progress of pathological science.

Handbook of Chemistry, Theoretical, Practical, and Technical. By F. A. Abel, Professor of Chemistry at the Royal Academy, Woolwich; and C. L. Bloxham, formerly First Assistant at the Royal College of Chemistry; with a Preface by Dr Hoffmann. 8vo. London. 1854.

Messrs Abel and Bloxham, two accomplished pupils of Professor Hoffmann's, have in this work sought to combine a text-book for the student in the lecture-room, a guide for the analyst in the laboratory, and a volume of general reference for the metallurgist, and other practical chemical artists.

Such a work was wanted, and we have satisfied ourselves that it has deservedly received the imprimatur of Dr Hoffmann, who commends it to the English student.

Although including in its title theoretical, as well as practical and technical chemistry, it is chiefly devoted to the two latter departments of the science, which are discussed fully and clearly; whilst the general principles of chemistry are treated with sufficient fulness for a work mainly practical in its aim.

As a whole, the treatise is an excellent one; but in one respect it may be improved. It contains a much larger number of foot-notes than is desirable in a hand-book, where only the prospect of a great advantage can justify the addition of detached passages to the bottom of a page, which distract the reader's attention, and disturb his continuous perusal of the text. Such a remark may seem hypercritical, and would be so were the notes strictly supplementary matter. But the great majority of Messrs Abel and Bloxham's notes have as much claim to be portions of the text as the sentences actually contained in it, and the text and the foot-notes equally suffer by their separation from each other.

But we do not wish to dwell upon a defect which can easily be remedied in a new edition, and has probably been occasioned by one of the two authors writing the text of the work, and the other annotating it.
This is a very useful elementary treatise on vegetable histology. We notice it principally with the view of pointing out the nonsense of the following passage in the preface:—

"It has been thought advisable to omit the greater part of the description of foreign microscopes and auxiliary instruments contained in the original work. These details would, for obvious reasons, be uninteresting, if not useless, to the English reader. There is no doubt of the superiority of English instruments over those described by Dr Schacht; and the elaborate and able treatise of Professor Quekett affords all the necessary information upon the subject of English microscopes, etc."

Now, this is treating Dr Schacht very scurvily; for surely he is better entitled to think his microscope a good one, after having succeeded with it in so thoroughly working out the delicate anatomy of plants, than Mr Currey is, who, so far as we are aware, has not investigated anything. In our opinion it is very inconsistent to translate the excellent works of foreign histologists, and at the same time condemn the utility of the instruments they use. We consider that the excellence of the work is the strongest proof of the goodness of the means employed. Without in any way wishing to undervalue the advantage of a good microscope, or the admirable improvements of the metropolitan opticians, we cannot forbear stating that their instruments are too large and clumsy, their price preposterously great, and altogether disproportioned to their assumed superiority. Further, it should be understood that good powers of observation, and sound scientific knowledge, are the real essentials for histological investigation. With these, foreign inexpensive microscopes are amply sufficient, and without them the best instruments are useless.

Comparative Anatomy. By C. Th. v. Siebold and F. Stannius. Translated from the German and Edited by Waldo I. Burnett, M.D. Vol. I. Anatomy of the Invertebrata. London: 1854. Pp. 470.

In the English language at the present time we have no good standard treatise on comparative anatomy. It is true we have some excellent "Outlines" and "Lectures" (which, by the by, are very expensive), but, we repeat, we are greatly in want of a work which shall contain a well arranged and accurate digest of all the leading
facts which the combined labours of a host of observers in this department have of late years brought to light. The appearance of the above translation of Siebold and Stannius’ "Lehrbuch der vergleichenden Anatomic" at once fills up the void, and confers a boon upon the English student, of which, we are satisfied, he will readily take advantage.

With the view of rendering the work complete, Dr Burnett has added many useful references, and a supplementary bibliography. We cordially recommend this volume to all interested in the science of comparative anatomy.

Part Third.

Periscope.

Physiology.

Professor Remak on Multipolar Ganglion-cells.

By the publication, in 1846, of Stilling’s discovery of the so-called nerve-nuclei, in the pons varolii of man and the vertebrated animals, it was first shown that Purkinje and Müller had, like myself, found multipolar ganglionic cells, connected with motor nerve-fibres, in the nervous centres of the vertebrata. Rudolph Wagner also showed, in 1847, that each of the large multipolar ganglion cells of the electric lobe of the torpedo, sends a connecting fibre, by means of a prolongation of the axis cylinder, to the electric roots of the vagus and trigeminus nerves. The other branching processes of these cells, from their granular or striated structure, appeared to Wagner to be intended to unite the cells together.

In some researches I lately made on the torpedo marmorata, I could find no such connections. I easily made a satisfactory section of the electric lobe, by previously treating the fresh brain with a solution of corrosive sublimate, or of bichromate of potash. I found the ganglionic cells to be multipolar, surrounded by a soft nucleated sheath, and lying in the interstices of a vascular net-work. The processes sent from them to the electric roots of the vagus and trigeminus were collected at the base of the lobe, forming strong fasciculi, visible to the naked eye. The other prolongations of the cells were invested with thin membranous sheaths, and formed soft nerve-fibres, with dark borders, which entered the medulla oblongata. The connection between the ganglion cells and sensitive fibres has not yet been demonstrated; the sensitive roots of the vagus and trigeminus do not enter the electric lobe, for that of the former enters the medulla oblongata, and that of the latter, the grey appendage of the cerebellum (the feuillet restiforme of Serres and Savi), which in its structure, viz., the size and shape of its multipolar cells, is analogous to the cerebellum, not the electric lobe.

I have in my possession transverse and longitudinal sections of the human spinal cord—prepared by the celebrated Stilling, and presented to me by him—which show the passage of the motor nerve-root fibres into the multipolar ganglion-cells of the anterior grey laminae. (Saulen). The transverse section shows narrow lines of broad dark-bordered nerve fibres, which seem to connect the anterior and posterior roots. They extend from the point of entrance of the anterior roots into the anterior grey laminae, or from the external surface