too, to which the examination of my own cases and sections from the kidneys of those dying of scarlatinal nephritis leads me.

I believe that the fibroid appearance which I have mentioned is due to the flattened condition of the proliferated epithelial cells arising partly from natural mode of growth, partly from pressure, and that this change may take place both in the epithelial cells from the glomerular surface and in that of the capsular surface. I think, however, that the epithelial change is not the only source of cell-accumulation, but that wandering leucocytes take part in the process; for in some instances I see collections of round cells without corresponding changes in the adjacent epithelium. I doubt whether the cell-elements are derived from the interstitial tissue contained in the glomerulus: firstly, because the appearance of the cell-growth between the glomerulus and the capsule appears to me to betoken, as I have said, an epithelial origin; secondly, because it appears to me not yet proved that interstitial tissue exists in the glomerulus. It is true that Axel Key has asserted its presence; and recently Dr. Waller, in a paper on Scarlatinal Nephritis in the *Journal of Anatomy and Physiology*, has stated that the connective tissue can easily be shown by injecting the fresh kidney with gelatin tinged with carmine, and then staining with logwood. I have certainly failed to find proof of its existence in this way, and it has to be remembered that there are many sources of fallacy in the examination.

Langhans, in the paper to which I have referred, has lately given the result of his examinations of the constitution of glomeruli; and he is wholly unable to detect any connective tissue in the glomerulus, further than the division of the vas afferens. Runebergs, too, who has still more recently studied the structure of the glomerulus, is unable to find in it connective tissue.

There was a very marked distinction in the appearance of the glomeruli in the first case, and in the second and third cases. In the first, the changes seem largely connected with the capsular epithelium, though there were in many parts indications that the glomerular epithelium was also affected. In the second and third cases, whilst the capsule was thickened, and its epithelium considerably changed, the cell-accumulation seemed connected for the most part rather with the epithelium covering the glomeruli, than with that over the capsules.

Langhans has distinguished three kinds of structural alteration in the glomeruli: 1. Glomerular, where the proliferation of the glomerular epithelium takes place; 2. Capsular, where the capsular epithelium is the chief seat of proliferation; 3. Swelling of the capillary nuclei. Of the third form I have met with no examples, but I think the cases I have described bear a close relation to the two first divisions he has drawn, but that both changes are apt to occur together.

In the cases I have brought under notice, the glomeruli themselves have evidently undergone great changes apart from epithelial alterations. In some, the nuclei seem unduly numerous; in some, the glomeruli seem changed into fibrous tissue. The increase of the nuclei may be due to proliferation of the epithelium deeply seated within the glomerulus, or to increase in the capillary nuclei. The fibrous appearance may be due to simple obsolescence from pressure.

Dr. Klein has described a hyaline change as taking place early in the capillaries of the glomeruli in scarlatinal nephritis.

The cause of the special implication of the Malpighian corpuscle in glomerulo-nephritis can only be guessed at; but, if we look upon the capsular epithelium as being a continuation of the epithelium lining the tubules, as some hold it to be, then we may consider the glomerular nephritis as allied rather with parenchymatous than interstitial affections; but, like parenchymatous nephritis, it is usually accompanied by interstitial changes.

Dr. Klein seems to consider the glomerular affection as secondary to the blocking up of the afferent arteries, owing to changes in the arterial coat; but the arterial changes met with in many cases do not seem to me sufficiently great to lead to this result.

With regard to the effect of changes in the capsule and its epithelium, and in the glomerulus and its epithelium, it is evident that we may possibly have different results, if, as seems probable, these changes can occur separately, or one can greatly predominate over the other. Of course, in late stages, when the surfaces of the glomerules and capsules are united, the function of the glomerules is abolished; but, in an earlier stage, effects of capsular changes may possibly differ from those of glomerular epithelial changes, and eventually be recognised clinically.

There seems every probability that the albumen present in the urine in nephritis transudes through the glomeruli; and Lépine, in a recent article on the pathogenesis of albuminuria, in the *Revue Mensuelle*, sums up evidence giving fair ground for the belief that this transudation is probably connected with alteration in the epithelium lining the glomerulus, which he believes has much to do in health in preventing this transudation.

On the other hand, we might expect that capsular changes would only influence slightly the passage of albumen into the blood. Now we find, in cirrhosis of the kidney, where the capsules are commonly found greatly thickened, but extensive glomerular epithelial changes do not seem to be present, that the urine is copious, and the amount of albumen it contains small, until a late period of the disease is reached. It may be, of course, that a large number of glomeruli escape affection till a late stage, but the absence of any effect of capsular change on the amount of urine and albumen passed, seems to me the more probable explanation; whilst the fact that, in the cases where I have found a glomerular epithelium affected the albumen has been copious, leads me to think that this structural change may be at least one of the conditions, though by no means the only one which influences the amount of albumen present in the urine.

In Cases I and II, the amount of albumen was not due to undue vascular pressure, for the sphymographic tracing registered no indication of increased tension. On the arterial condition in the third case, I have no record. In all these cases, the rapidity with which the patients succumbed seemed to be dependent on the glomerular affection. In Case I, where it was most extensive and advanced, life lasted the shortest time. The rapidity with which intrascapular growth can occur is very remarkable. Unless we are to suppose that it can exist without giving rise to symptoms—a most improbable supposition—it would appear that in Case I two months was sufficient for the advent of most extensive and advanced glomerular nephritis. In this case, too, the influence of glomerular changes on the production of dropsy was very plain. I never before met with such enormous anasarca.

The cases which I have brought forward seem to indicate that the glomerular changes may play a most important part in the production of the clinical phenomena in Bright's disease; and it is somewhat remarkable that, until a very recent period, these changes have not received that attention to which, it seems to me, they are entitled.

ON THE TREATMENT OF UTERINE FLEXIONS.

By HENRY GERVIS, M.D., F.R.C.P.,

Obstetric Physician to St. Thomas's Hospital; Examiner in Obstetric Medicine at the University of London; and the Royal College of Physicians.

I PROPOSE in this paper to bring forward a few practical observations on the subject of uterine flexions. On its general pathology, I do not wish to say anything beyond expressing my agreement with the proposition laid down by Dr. Graily Hewitt, that, in cases of acquired flexion, an unhealthy condition of the uterine tissue, an "undue softness", connected probably in a large proportion of cases with general malnutrition, is the condition antecedent to the bend; and I would add my belief, that the recognition of this factor is of primary importance in relation to the treatment. A healthy uterus may be displaced as a result of a change in the correlation of its supports; but a healthy uterus will not, I believe, bend upon itself as a result of any force which may be applied to it, unless its normal firmness and resiliency be diminished or lost. One other general remark I would make is this, that the importance of flexions depends very much upon the amount of obstruction in the utero-cervical canal produced by the bend. If there be no obstruction, I believe the bend, *per se*, to be in many cases, at all events, of small consequence; but, if there be obstruction, and in direct proportion to its amount, then a series of pathological results follows, including obstructive dysmenorrhœa, endometritis, uterine hyperplasia, ovarian irritation, and pelvic hyperæmia. Thus, I have been consulted in many cases of sterility, as to its probable cause; and, on making examination, I have found distinct flexion in the uterus, but no evidence of any other disease whatever; and no complaint of any interference with menstruation, no local pains, and no difficulty in locomotion. In some of these cases which I have had the opportunity of watching, the reposition of the uterus, and its maintenance in a correct position by a pessary, has not resulted in the issue wished; and so, probably, the malposition was not the cause of the sterility, as certainly as it was not of any other pathological conditions. I do not wish by these remarks to be supposed to undervalue the importance of flexions. On the contrary, I believe that, in the large majority of cases, they are conditions of extreme importance; but I believe that importance is in direct proportion to the obstruction produced, and that, in the few cases in which there is no obstruction, the direction in which the fundus uteri looks is of small consequence.

In the majority of text-books, the treatment of flexions is described, without any guidance as to its applicability in individual cases; and I believe this is why disappointment is frequently experienced by practi-

tioners in the results of their treatment. Flexions are directed to be treated by certain means, but the cases are not sufficiently particularised as to their suitability for one sort of treatment rather than another.

Firstly, as to cases of retroflexion. I would suggest, for practical purposes, the division of these flexions into three classes: 1. Those in which the uterus is capable of reposition, and, when replaced, fairly retaining, with suitable external support, the normal position; 2. Those capable of reposition, but resuming the faulty position on the withdrawal of the replacing force; 3. Those incapable of reposition, either from the presence of adhesions, or from the permanently damaged condition of the uterine tissue at the site of the bend.

The first class obviously includes the more recent and the more hopeful cases, and in these, the line of treatment which yields the best results is I think as follows. The question of capability of reposition has of course been first settled by the use of the sound, and the general conditions of the case investigated. Sometimes, indeed, without the use of the sound, if much parametric exudation be found to be present, it may be evident that, for a time at all events, until some impression has been made upon the exudation, it will be useless to attempt reposition. But, supposing that no such exudation be found, and no other obvious obstacle to reposition, and that examination simply reveals the existence of a flexion more or less acute, there still remains certain preliminary treatment before commencing systematic reposition. Attention to the bowels is of considerable importance, a loaded rectum being a serious obstacle to all pelvic manipulation. Not less important is the removal of any acute congestion of the uterus or vagina by rest, tepid irrigation, salines, and in some cases even leeching, before commencing mechanical treatment. If, however, there be endometritis present, I think it best not to treat it by local intra-uterine applications until the uterus is in better position. I have frequently known a remarkable improvement occur in the condition of the lining of the uterus, solely as a result of the restoration of the uterus to its normal position, without any local treatment whatever. As much of local congestion, therefore, as possible being removed by such measures as I have indicated, the replacement of the uterus is proceeded with.

There are various methods adopted by different practitioners with this object in view. Some attempt it by digital pressure applied to the fundus, either *per rectum* or *per vaginam*; some by various modifications of the postural method, aided or not by fundal pressure; while others employ some variety of sound. And, on the whole, the use of the sound is, I think, the most effectual method, and, when employed with care and dexterity, is attended but very rarely with any untoward results. Reposition with the sound may be effected in some cases by using it simply as a lever, after introduction carrying the handle gently backwards; in others, by accomplishing a careful rotation of the handle; but, in both ways, much advantage is gained by a simultaneous pressure on the fundus by one or two fingers introduced into the vagina. Indeed, many cases which appear to resist either digital pressure or the sound separately, will yield readily to the combination. When in this manner the uterus is placed in normal position, in the class of cases under consideration, on the withdrawal of the sound, it does not fall at once back into its faulty position, although it probably would do so were the patient to move about, and no support be given to the uterus. But at once a pessary is introduced. The pessary I use, in the large majority of cases, is a vulcanite Hodge's, with a square front, and the sides curving considerably upwards to the posterior bar. The advantage of the square front is, that it lies well behind the symphysis, with which it is parallel, so that any incorrectness of position can be at once recognised at any future examination. With the circular-fronted pessaries, this is not so; it is extremely difficult, indeed, with such to be certain that they are in proper position; and the objections to the pessaries narrowing to a point in front which projects under the pubic arch, are obvious, at all events, in the case of married women. One object of the treatment is now obtained; the uterus has been straightened, and is maintained in its proper position by external support. It remains to adopt measures to so strengthen its tissues, that it may in time be able to maintain its position without external support. To this end, both local and general tonic measures are adopted suitable to each case. If there be endometritis present, its cure will be facilitated by the use of appropriate intra-uterine applications, although in many cases I have found, as already mentioned, the endometrial symptoms gradually disappear after the rectification of the malposition.

Beyond this, it is important from time to time to make sure that the uterus is maintaining its correct position, and that the means used to rectify its want of tonic are proving effectual. And if, from digital examination, it is obvious that the further use of the sound is unnecessary, it will yet be advisable every few weeks to remove the pessary, to wash and replace it; pessaries which have remained in position too

long without removal having, as is well known, often led to ulceration of the vagina, and sometimes the production of fistulæ.

And, finally, after a time varying with each case from three to twelve months, it will be well to remove the pessary, and allow the patient to be without it for a week or two, and so test the ability of the uterus to retain without extraneous support its normal position. And, even after such trial, and the uterus found remaining in its normal position, it is advisable to warn the patient of the possible relapse which might follow impairment of general health, or any overstrain on the pelvic viscera. Of the second class of cases—those capable of replacement, but resuming their faulty position on the withdrawal of the replacing force—the preliminary treatment remains the same; but the further treatment differs in regard to the frequency with which reposition is effected; and the prognosis varies with the condition of the tissue at the seat of the bend and the progress of the case under treatment. In the previous class of cases, after reposition is once effected, the sound may never have to be used again, if by digital examination the position be found obviously good; but, in the class now under consideration, the regular use of the sound is an essential part of the treatment. At least once a month the uterus should be straightened, and the accurate fitting of the Hodge's pessary carefully tested. The adoption of the prone position should also be encouraged, and the tonic of the uterus especially cared for by external and internal applications, apart from any question of uterine catarrh.

The third class includes those cases in which the attempts at reposition are unavailing, from the presence of adhesions. These adhesions may have resulted from bygone pelvic peritonitis, or parametritis, of which the previously flexed uterus itself may have been the predisposing cause; or from pelvic inflammation, following miscarriage, the result also, possibly, of the flexion. In some cases an enlarged ovary will be found by the side of the uterus, more or less adherent to it, and adding to the difficulty of reposition. These cases are not numerous, but are certainly met with from time to time, and I have known several instances of acute and dangerous symptoms arising from forcible attempts in such at reposition. Something, however, may be sometimes done towards encouraging absorption of the exudations and so freeing the uterus; and if this fails, still some relief is often gained by such support of the fundus as can be attained by wearing a pessary, and if menstrual disorders are severe, the patency of the canal can be insured by the use of the uterine bougies, and their severity thus mitigated, if not cured; and finally, in some cases there remains the question of the bilateral division of the cervix.

Secondly, with respect to cases of ante flexion, the variety of pessaries recommended, and the frequent disappointment experienced, are, I think, sufficient indications of the difficulty met with in maintaining the uterus in position when once it has bent forward. The classification suggested for cases of retroflexion is not equally serviceable for these. It is much rarer, on the one hand, to find cases of ante flexion, which, when straightened by the sound, retain even for a short time the normal position; and on the other it is also rare to meet with cases of ante flexion, in which temporary reposition is opposed by adhesions. It should be noted, however, that cases are sometimes met with in which the uterus is so soft that at one time it is found in ante-, and another in retroversion. In a much larger number of cases of ante flexion than of retroflexion, the defect is either congenital, or dating from early life, and not unfrequently associated with a conical cervix and small os. The difficulty of applying adequate external support to the ante flexed uterus appears to arise very much from the shallowness of the anterior vaginal *cul-de-sac*; and this difficulty applies more or less to all varieties of external support. The two with which I am most familiar are Dr. Hewitt's and Dr. Thomas's. I have used both in numerous cases; but the number in which their use has cured the patient has been extremely small. They both undoubtedly give support to the simply anteverted uterus, especially if it be associated with some general prolapsus; but they frequently fail, even partially, to rectify ante flexion.

The stem pessaries, although keeping the uterus straight when flexed upon itself, have proved so frequently sources of endometrial inflammation, and where they have to be removed during the catamenial flow are so obviously unsatisfactory that I have not largely used them. But adopting the principle that the patency of the cervical canal is the chiefly important matter, I have for some time now treated these cases mainly by securing dilatation of the cervix by the uterine bougies, supplementing this in some by the use of an elastic ring pessary, which appears sometimes to add to the patient's general comfort, although by itself alone doing little or nothing to relieve her menstrual disorders. I begin, shortly after a period, with one of the lower numbers, according to the condition of the canal, in a few days passing the next in size, and in a few days again one larger still; on each

occasion leaving the bougie *in situ* for about ten minutes. Within ten days before a period, it is not advisable to use the bougies. The process is repeated, until No. 12 can be passed easily. In some cases, those especially of corporeo-cervical anteflexion, the process is undoubtedly a painful one; and in any, it may have to be intermitted occasionally for acute congestive symptoms; and in all it is needless to say it must be employed with judgment. I can but add that, in a very large number of cases the result has been highly satisfactory, and followed by distinct alleviation of the worst symptoms of the flexion, direct and indirect. In conjunction with this mechanical treatment, attention is also paid to whatever may be the associated pathological condition of the uterus. If, for example, there be endometritis, it is quite appropriate to carry out suitable intrauterine applications in the usual manner. Any associated disorders of the vagina or bladder may also be treated concurrently; and it is almost needless to add that attention to the general health is invariably considered of the first importance.

Note.—June, 1881. Since the above was read at the Cambridge meeting last August, I have been using, for cases of retroflexion of the uterus, a modification of Hodge's pessary which has given me much satisfaction. In all the Hodge's pessaries with which I am familiar, the sacral end, which supports the fundus uteri, is more or less rounded. The result is a constant tendency on the part of the fundus uteri when resting on it to slip to one or other side. The posterior aspect of the fundus being rounded, and the pessary rounded also, it can only give the uterus support at the point of contact. I have therefore had the sacral or upper cross-bar of the pessary made with a central depression, the convexity looking downwards instead of upwards. On this the uterus securely rests; and while a steady equable pressure is thus maintained by the pessary on the fundus, all lateral shifting of the instrument is obviated. These new pessaries are made by Messrs. Walters, of Palace Road, Lambeth.

THE DIRECT METHOD OF ARTIFICIAL RESPIRATION FOR THE TREATMENT OF THE DROWNED, STILL-BIRTH, ETC.

By BENJAMIN HOWARD, A.M., M.D., F.R.C.S. Ed.

II.

COMPARED with the apnoea from drowning and with that from chloroform narcosis, the apnoea of the newly born presents features different and distinctive.

In contrast with other methods, each of which has but one process alike for the drowned adult, for the still-born infant, and for all other cases of apnoea whatsoever, the direct method has, for still-birth and for apnoea from other causes respectively, adaptations and provisions correspondingly different and distinctive.

Of the principal distinctive conditions in apnoea neonatorum requiring special modifications of the ordinary treatment for apnoea, may be mentioned:

1. The occasional temporary continuance of the circulation in the funis;
2. The unused state of the lungs.

In view of the occasional continuance of the foetal life in apnoea neonatorum, the ability to continue the treatment for the respiratory life, without the first and customary sacrifice of the foetal life, must be admitted to be of no small importance. The lungs having never been used are objectively, I think, less readily receptive of air in response to the ordinary mechanical means of artificial respiration. The early and regular alternation of insufflation with these means, therefore, greatly promotes and ensures an exchange of air, the failure to obtain which may otherwise be complete, and also unnoticed. Both these important desiderata, though impossible by other methods, will be found to be easily practicable by the direct method; and this before the division of the funis, as well as after it.

Of other distinctive subjective conditions, the undeveloped state of the respiratory muscles may be noticed in passing, the medium between the extended arms, after the manner of Sylvester, and the alleged consequent thoracic expansion, being therefore comparatively wanting. *Per contra*, the very incomplete ossification of the ribs renders the entire lower part of the chest particularly susceptible to the direct compression by manipulation, according to the method under consideration. Assuming that the direct method, as it has been explained by me, for the treatment of the drowned (see BRITISH MEDICAL JOURNAL for June 18th, 1881), is more or less familiar, it is needless to say that the treatment to be described for apnoea neonatorum is, of course, simply an adaptation by which the same principles may be applied, with the greatest convenience, in the very different conditions of still-birth. Briefly stated, the child at birth so rests in the left hand of the opera-

tor as to make the chest prominent, the shoulders rather dependent, and the head hang free; while the thoracic compression is made at will by the right hand. Also: in addition to anything attempted or practicable by other methods, insufflation and the movements for expiration are easily and rhythmically practised before division of the funis, when expedient, as readily as afterwards.

Although the treatment of apnoea neonatorum, unlike that of the drowned, falls to those only who, being more or less expert, require suggestion rather than direction, it may not be amiss to describe more in detail the course which I have more generally been accustomed to follow.

Assuming, then, the possibility of some remaining circulation in the funis, and that smart slaps, alternate dashes of hot and cold water, etc., have failed to awake natural respiration, I receive the child in the left hand—so that its buttocks rest upon the fingers, and its head falls by its own weight over the forearm or wrist. The little thorax, thus brought prominently forwards, is grasped by the right hand (as seen in the accompanying engraving), by which the desired compression is readily located, distributed, and alternated, as may be expedient. As a rule, the compression is made gradually and thoroughly in about three seconds; then, suddenly letting go, I rest about three seconds, to allow a complete rebound; then repeat the bellows-movement at about the rate of ten or twelve a minute. If within the first minute or two there be still no natural respiration, I get an assistant at once to practise mouth-to-mouth insufflation in the following manner. The mouth of the infant having been thoroughly cleansed and dried, the assistant closes the nostrils of the infant with one hand, while the forefinger of the other hooks forward the tongue—the middle or little finger meanwhile pressing firmly back the larynx. Mouth-to-mouth insufflation of fresh air being now steadily and forcibly made, none of the air will pass down the oesophagus, but will so directly enter the lungs that the entire thorax may be seen so to expand that, in many cases, the lower intercostal depressions will be quite obliterated. At first, it is well to make the insufflations alternate with the compressions regularly, and so continue this for about five minutes. By this time, any good which may have been hoped for from the maternal connection has almost certainly ceased, and the funis may be divided. The artificial respiration, with regular or only occasional alternations of insufflation, may now be resorted to; and, if preferred, with all but the head of the infant in a warm bath, or covered loosely with flannel. Without interrupting the process, friction-electricity also, or, if desired, even tracheotomy, may now be superadded, according to the preference of the operator, each one of which may be practised without interfering with the other. The position of the infant's head, which should, as nearly as possible, be that of utmost extension, as I have elsewhere described (see *Proceedings of the Royal Medical and Chirurgical Society*, part 67, page 332, and BRITISH MEDICAL JOURNAL, June 18th, 1881) not only ensures the complete raising of the epiglottis, but also increases the antero-posterior diameter of the entire pharyngeal air-way to the glottis. By this position, too, the mouth of the infant is most conveniently accessible to the assistant, who, on the other hand, is quite out of the way of the principal operator.

So much for a mere outline of my own general procedure in an average case. Respecting the time for dividing the funis, and many other details, probably no two persons would precisely agree—nor is it important that they should. Indeed, in cases like these, where every resource can be on hand in advance, few practitioners of experience would be content to confine themselves to any single course: hence the convenience to such of the direct method, which, in contrast to other methods, maintains respiration in a way so simple as to allow almost any other means of resuscitation whatsoever to be used, at discretion, simultaneously.