shock or suffering, but it ultimately succumbed to convulsions caused by the continued escape of the subarachnoid fluid. The domestic circumstances of the mother demanded her presence at home, and unfortunately she was allowed to leave the hospital with her child, and the following night the mischief took place; and, though the flow was stopped, it had already prostrated the child. Every reasonable effort was made to obtain a *post mortem* examination, but without success. I may mention that several analyses of the subarachnoid fluid withdrawn from this child were made, resulting in doubtful indications of the presence of sugar, or of some glucose matter which reduced copper oxide. At present, I have under observation another instance of this defect in the lumbar region; the child is about ten days old, and it has not yet been interfered with.

But the question may be put, How is the cure produced? or, What is the *modus operandi* of this solution when injected? The reply which most readily suggests itself is, that it is analogous to the process occurring in the tunica vaginalis consequent upon the operation for the radical cure of hydrocele.

Though the quantity of albumen in the subarachnoid fluid is small, a coagulum seems to form; adhesive lymph may be produced or deposited, and, at all events, arrest of further collection of fluid results from successful injection. This may be accompanied or followed by closing of the opening or channel of communication between the spinal canal and the protrusion.

The anatomy of this defect at once presents itself as a matter for consideration; and, on this point, I have made some inquiry, and have been rather disappointed to find that anatomists of very prolonged experience had little or nothing to offer me in the way of personal observation of its dissection. Figures of the parts have been given in books, with appropriate descriptions. All authors seem to agree in the local deficiency of the spinal canal, and the protrusion of the covering of the cord, containing a quantity of the spinal fluid, and the cord (or portions of its immediate branches), though it has been affirmed that occasionally the latter is absent. I am not aware upon what evidence this statement rests, and, meantime, prefer to believe in its presence while awaiting further investigation. Such belief may induce caution in treatment, though it need not lead us to doubt the possibility of cure, as a recent writer in the *BRITISH MEDICAL JOURNAL* seems to do. To assume the absence of the cord, or parts of it, in seven consecutive cases, is so entirely beyond the range of probability as to be altogether inadmissible, while possibly it was present in all. At the same time, I shall feel personally indebted to any one who may procure authentic information on this point, such information as may amount to a demonstration or dissection of parts. I am able to show you here a dorsal case, or rather a preparation of it. The child died, exhausted by the escape of the cerebrospinal fluid; no attempt having been made towards cure. The cord is seen projecting into the tumour, and attached to its walls. I am glad to say that, as yet, I cannot show an injected case, that is, a dissection of a case after successful injection, however much that may be regretted in an anatomical point of view. On this point, authors write very much as follows, which can be seen in Dr. Churchill's work on *Diseases of Children*, and there given on the authority of Dugès. "The condition of the spinal marrow is of considerable interest. Ollivier states that, when the case is not complicated with hydrocephalus, he has generally found the spinal marrow traversing the sac unaltered, except that in some cases it seems lengthened. But, if coexistent with hydrocephalus, or if the canal of the spinal marrow be distended with fluid, the cord may be flattened out, as it were, so as apparently to line the sac. In some few cases", continues Dr. Churchill, "the spinal cord seems to have left the canal, and to be contained within the tumour, forming what some authors have properly called hernia of the spinal marrow. This happens only when the deficiency is at the lower end of the spine."

In a lecture on pathological anatomy published in London this year, Drs. Wilks and Moxon write: "A funnel-like depression or umbilicus in the middle of the tumour, will generally signify the point of insertion of the spinal cord on the walls of the sac." This is worthy of recollection by those about to operate. There is evidently some variety in the position of the cord and the distribution of its branches.

The statistics of the operation at the present time are the following. This mode of injection has been employed in ten cases. Of these, seven have been successful, and entirely so; the cases being uncomplicated by paralysis or any other deformity, and, so far as known to me, remain well. Of the other three, one has been already referred to as dying from a preventable cause, a well known danger; another occurred in the hands of Dr. Watt, who states that the child was otherwise diseased at the time; and the third is the case published by Mr Burton of Liverpool, manifestly a case in which the spinal protrusion

was but a small part of the whole deformity; though, seeing the child in *extremis*, he considered it his duty to give it even a forlorn chance. We are thus in the position of recording 70 per cent. of cures, and at the worst 30 per cent. of mortality; and, when we revert to the past history of spina bifida, such a result is sufficiently gratifying. I ought to add, however, for the encouragement of others, that all my own lumbar and dorsal cases have proved fortunate hitherto; that they will always do so, I am not sanguine enough to expect, though I can now approach their management with less misgiving. I have been exceedingly pleased to find that this method of treatment has succeeded in the hands of others, and have to thank Dr. Watt and Mr. Angus for the publication of their cases.

In managing a case of spina bifida, the following points are important.

1. The child should be in a thriving condition.
2. Make a tentative puncture with a grooved needle.
3. Draw off not more than half of the fluid contents.
4. Carefully close the puncture by collodion or otherwise, so as to prevent further escape of fluid.
5. When proceeding to inject, use a trocar with cannula of a medium size, not too small, otherwise the glycerine solution will not run readily through the cannula.
6. The parts must be carefully handled and protected by the nurse, and the injection repeated, if required.

P.S.—At the Edinburgh meeting, in August last, Professor Pirrie, of Aberdeen, drew my attention to a wet preparation of a similar case, in which the cord passed through the sac, and was attached to the outer wall of it.

ON THE USE OF NITRIC ACID AS A CAUSTIC IN UTERINE PRACTICE, AND ITS SUPERIORITY AS SUCH TO NITRATE OF SILVER.*

By JAMES BRAITHWAITE, M.D. Lond.,

Co-Editor of *Braithwaite's Retrospect of Medicine*; Assistant-Surgeon to the Leeds Hospital for Women and Children.

I BELIEVE that, in cases in which the use of a caustic is necessary for the cure of ulceration or erosion of the os and cervix uteri, that which is generally, but not invariably, the most suitable for our purpose is nitric acid.

I do not propose to enter upon the disputed question of the pathological importance of these affections, nor upon any other point in their treatment, such as the primary relief of congestion or inflammation. I cannot, however, with Dr. Routh (*Transactions of Obstetrical Society of London*, vol. xi, page 94), look upon the use of caustics as solely for the purpose of relieving congestion by means of the discharge produced, in which case nitric acid would be useless, for it produces no discharge. I find that by curing the ulceration we cure the congestion, generally, but not always, without other treatment.

I think it will be admitted that nitrate of silver is the caustic in most general use, and that it is unnecessary I should take up your time by references to writers on the subject to prove this.

The great fault of nitrate of silver for the purpose in question is the fugitive nature of its action. Its influence seldom extends beyond five or six days, even when rubbed upon and held in contact with the parts. Again, nitrate of silver is more a stimulant than a caustic, causing extreme turgescence of the capillaries immediately below the surface actually influenced. This is evidenced by the frequency of hæmorrhage, often sufficient to obscure the parts before it has been removed from contact with them. The escharotic action of nitrate of silver, such as it is, is too superficial to destroy the diseased surface, and by the production of a slough to stimulate the parts beneath to the healthy activity necessary for its separation. At the second examination, we often find the ulceration or erosion very little, if at all, altered in appearance.

The action of nitrate of silver is thus defective for our purpose—1, in duration; 2, in quality; and 3, in degree; and these faults must be atoned for by its frequent reapplication. This necessitates each time the use of the speculum, distasteful alike to patient and to attendant. I believe in this really lies the source of the opinion held by some eminent men that these diseases require little or no local treatment. Our opinions are often unconsciously influenced by our wishes. Dissatisfaction with nitrate of silver has caused the trial of other applications such as sulphate of zinc points, nitrate of mercury, potassa cum calce,

* Read before the Section of Obstetric Medicine at the Annual Meeting of the British Medical Association in Edinburgh, August 1875.

ignited charcoal-points, and electric heat, all of which either have some disadvantage or are ineffectual. I believe nitric acid to possess these advantages as a caustic in uterine practice. It requires no special preparation, and is always at hand; it cannot affect the system as may a salt of mercury; it does not spread like potassa cum calce, nor is its action so deep; it produces little or no pain, and no hæmorrhage. These advantages are trivial compared with the fact that, when it has once been properly applied, in the majority of cases no further interference is necessary, and thus that opprobrium of our branch of the profession—the frequent use of the speculum—may be done away with. When the second examination is made, it should be after the lapse of a month; and it will then sometimes be found that there is a small spot requiring a fresh application of the acid, but often the sore is seen to be quite healed, or healing satisfactorily. The eschar separates slowly, and the resulting sore has a very strong tendency to heal. The fresh mucous membrane which forms is not cicatricial in appearance, and, when healing is going on satisfactorily, has a sharply defined edge, and, being of a pale rose colour, contrasts strongly with the bright red colour of the sore. The contraction is greater than follows the use of any other caustic; but this is a great advantage, for, on account of the relaxed state of the tissues, it is just what is required to insure the permanence of the cure. The acid is best applied by means of a small and tightly rolled piece of cotton-wool, which is to be placed by means of an ordinary speculum-forceps in contact with successive portions of the surface, until the whole is covered with a white eschar. In a case of chronic endocervicitis, the acid should be applied to the interior of the open cervical canal; and, if it be not open, the case is not one suitable for this treatment. The contraction which accompanies healing is only to a healthy and natural state, provided the caustic has been used with ordinary prudence. I have never seen anything but good follow its use, and the ease with which a chronic case of cervical catarrh with ulceration or erosion may be cured by it is something marvellous. The bulk of my cases have been hospital out-patients, and the comfort the use of nitric acid has been in their treatment is very great, both in certainty of result and in saving of time. Without local treatment, very little can be done for these patients, for hygienic treatment is generally impossible, and medicinal treatment alone is useless. I shall not take up your time by details of cases, although I have copious notes of about forty, as by trial of the remedy you will soon prove your own opinion of its value.

The use of nitric acid as a caustic is so familiar to us all, especially in diseases of the rectum, that I have had some hesitation in bringing the subject before you, and should not have done so, but that I believe it is only used by two or three medical men engaged in the treatment of diseases of women. It is mentioned incidentally at the conclusion of a paper by Dr. Lombe Atthill, upon its application to the interior of the uterine cavity, that he uses it habitually in the diseases in question; and Dr. Roe of Dublin, in an analysis of the cases of uterine disease (*Dublin Journal of Medical Science*, August 1872), relates a case of extensive ulceration in which he employed it. Mr. Robert Ellis has recommended the use of a saturated solution of nitrate of silver in nitric acid; and I believe Dr. Bennet has mentioned its use. But these writers are exceptions to the general rule. It is not mentioned by Tilt in his admirable work on *Uterine Therapeutics*, nor by any other of our standard authors upon diseases of women, all of whom recommend nitrate of silver, or mention its use as the usual practice.

ON A NEW DOUBLE STETHOSCOPE: "THE HEAD-SPRING STETHOSCOPE".

By R. HARVEY HILLIARD, M.D.

THE object of this design is to produce a flexible double stethoscope which is free from the objections that apply to other instruments of this class. The advantages of a double flexible stethoscope are apparent in a moment's consideration. The ease to the auscultator, who may be seated at his patient's bedside, and with comfort to himself and his patient, to apply the instrument to all parts of the body without painful pressure or other inconvenience to the patients on the one hand, or unnecessary straining to himself on the other, is very plain; and if this can be done without loss of conduction of sound, and with an instrument as conveniently carried in the pocket as the ordinary wooden stethoscope, the superiority of the double instrument would be granted by medical practitioners, and eagerly welcomed as a boon long sought for. The objections, however, have been that instruments of this class are too bulky for ordinary practice, and that the acoustic results have been less perfect than the simple wooden stethoscope in almost universal use.

These objections I believe I have overcome by the instrument I now present to the profession.

The "head-spring stethoscope" consists of two simple tubes of finest India-rubber, very smooth, and equal in calibre, from their attachment to the chest-piece (or pieces) to the well adapted "ear-nipples", which are held in the ears by means of a low spring hinged in the middle for greater convenience of carriage in the pocket, which, by its elasticity, retains its position when carried over the head or under the chin. When it is desired to use the instrument as a differential stethoscope (Fig. 1),

the ends of the tubes, which bear suitable mounts, are screwed into separate collectors or cups; but when a binaural stethoscope (Fig. 2), with single chest-piece, is required (which, for most purposes, is the preferable combination), one of the cups alone is used, to which are attached the tubes by means of a branched body-piece which bears corresponding screw-adjustments. These changes can be made at pleasure and almost immediately. Fig. 3 shows one of the tubes fitted with cup and "ear-nipples" for use as a single flexible stethoscope. I have used the instrument for two years with increasing satisfaction; and I believe that experience will prove that I have not overrated its merits.

Messrs. Arnold and Sons of West Smithfield are the manufacturers; and they have bestowed great pains in executing my instructions.

CHRONIC POISONING BY ARSENIC.

By ARTHUR T. HARRY KERR, L.R.C.S.I., Preston.

THE following case of poisoning by arsenic in the manufacture of cotton is, I consider, of importance from a toxicological point.

John L., aged 28, a weaver, commenced to weave, about the end of September last, a green material. About the 25th of October, he first complained of being ill. At the end of October, his symptoms were loss of appetite, nausea, colicky pains, constipation, headache, emaciation, sleeplessness, strangury, inflammation of the conjunctivæ, with intolerance of light. There was no cutaneous eruption, nor local paralysis, which are usually found in chronic poisoning by arsenic. Taking these symptoms into consideration, and the fact that the others employed at the same material were affected similarly, I was led to suspect arsenic as the cause. Accordingly, I obtained some of the green yarn, and made an analysis of it; and I found it to contain a large amount of arsenite of copper (Scheele's green).

This patient was treated by emetics in the first instance; subsequently, by the moist peroxide of iron, albuminous and mucilaginous drinks. The symptoms of poisoning have now disappeared. As he is still weak, he is at present taking tonics.

The habit which weavers have of biting the ends of cotton before knotting has, I have no doubt, been the principal way in which the poison in this case was taken into the system. The absence of skin-eruption and diarrhoea in this case is unusual.