were made to increase this. Further, there was evidence of serious injury to the ulnar nerve. The little and half the ring fingers were anæsthetic, there was wasting of the short muscles of the former and of the adductor pollicis, and the interossei would hardly act at all. The epicondyle was readily felt to be drawn downwards and a little backwards, and that region was very tender to palpation. Seeing that all ordinary means had failed and that the muscles were wasting, I thought it advisable to relieve the condition by operation, to which the parents readily consented. He was admitted under my care by the kindness of Mr. Treves. Under antiseptic precautions I cut down upon the epicondyle, and found it firmly fixed in the position described, with the ulnar nerve stretched over its posterior and outer surface. The nerve was not distinctly made out to be inflamed. It seemed inadvisable to fix the epicondyle in position, as it would have been necessary to divide all the muscles and ligaments attached to it, so it was carefully excised. The elbow-joint was necessarily opened. He made a good recovery with the exception that a small abscess (probably not in the joint) formed and had to be drained. This should not have occurred, and I am inclined to attribute it to the splint having been applied too tightly and so irritating the small wound. At any rate, the ultimate functional result was very satisfactory. Sensation returned in the anæsthetic area within a few weeks; power was regained over the interossei, etc., and he was able to bend the elbow to about 50°. Some six months later I got him to return for examination, and although slight limitation of both flexion and extension remained the arm was thoroughly useful, all pain on movement had disappeared, and he considered the arm practically as strong as the other one.

It may of course be suggested, looking at the ultimate favourable result in Granger's cases, that an operation was not necessary, but, generally speaking, it is exceptional for symptoms of pressure on nerves due to bone (not recent callus) to subside entirely; and it may be mentioned that Bardenheuer and other German surgeons have actually excised the elbow for conditions similar to that which my patient presented. The part removed proved on section to include the whole of the small epiphysis for the internal epicondyle.

The accompanying engraving, taken from a photograph,

shows the extreme limit of flexion at the elbow before the operation, only about 10 degrees, and this was accomplished with some pain.

To summarise: 1. Detachment of the internal epicondyle (as an epiphysis) is a very frequent injury in early life, and often accompanies dislocation of the elbow joint.

2. The detached fragment is displaced downwards, and is rarely, if ever, reunited by bone.

3. In the treatment passive motion should be commenced within three weeks, and should be persevered with until the joint regains its function.

4. In several cases, owing to pressure on the ulnar nerve, great limitation of movement, and trophic changes in the region supplied by that nerve, have resulted. In such cases it may ultimately be advisable to excise the detached piece of bone, but excision of the joint, which has been performed in one or two cases, is quite unjustifiable.

IMPROVED METHOD OF EXAMINING THE AUDITORY CANAL AND MEMBRANA TYMPANI.

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DURING the last two years, both in public and private practice, I have constantly employed the aural speculum and head rest which I now submit to the criticism of my professional brethren. They were exhibited in the Section of Otology at the annual meeting of the Association in 1890, and although it is true they are only modifications of ordinary instruments, still I believe that in many cases they will render the examination of the membrana tympani and audi-

tory passage more easy, and tend to facilitate accurate diagnosis.

The speculum with the mirror and lens attached to it, and placed opposite to each other, is represented in Fig. 1. The instrument is constructed with a broad metallic ring, which can be fixed to the funnel-shaped tube by a bayonet-joint, and on the rim the concave reflector is fixed with a short handle working in a ball and socket joint, so that it can be turned in any direction and secured in any position. Within the ring, and movable on a hinge, is a convex lens with a focus of about 3½ inches. When not in use the lens can be folded within the speculum and the mirror utilised as a cover.

Fig. 1.

Fig. 2.

The correct position for a patient during an aural examination is represented in Fig. 2. The rest consists of a strong wooden stem with a handle fixed near the upper end for the patient to hold, and a support for the head, well padded and covered with leather. The headpiece is attached to a movable slide, which is enclosed within the stem, and is constructed so that it can be adjusted at any required height. With this simple contrivance both ears can be alternately examined by directing the patient to turn round the head without any other change of position.

In examining the ear the auricle must be drawn upwards and backwards, the speculum held by the left hand, and the mirror and lens manipulated with the right. Good daylight can be used for the illumination, and when this is not available I employ a gaslight or electric lamp, elevated about one or two feet above the head of the patient. The position of the mirror must be regulated so that the pencil of light falls upon the bottom of the meatus, and this will make the tympanic membrane and the upper part of the auditory canal clearly visible. The lens will often be found an additional aid in diagnosis, and for the purpose of getting rid of the reflection of the mirror from its surface it is generally necessary to give it a little obliquity.

The plated funnels are made in various sizes, and can be utilised for the ordinary method of aural examination. The mirror and lens can be obtained with the specula from Messrs. Maw, Son and Thompson, and I am indebted to Mr. John Banks (of that firm) for carefully carrying out my design. The entire instrument, including five funnels and the case, weighs only 4 ounces.

Ears are not always easy to examine. The external passage is often small and tortuous. Sometimes epithelial scales, fibres of cotton-wool, and other foreign substances, mixed with cerumen, obstruct the illumination. In many cases the meatus must be carefully cleansed before the condition of the membrane can be accurately observed. The manipulation of

my reflector can be readily acquired with a little practice, and I am confident that it will be found of much utility in many cases. It is very serviceable for class demonstration.

ON THE USE OF SALICYL-SULPHONIC ACID AS A TEST FOR ALBUMOSES AND PEPTONES (SALIPHONIC TEST).

By JOHN A. MACWILLIAM, M.D.,

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IN a former paper in the *BRITISH MEDICAL JOURNAL* of April 18th, 1891, I described the results which I had obtained by the use of salicyl-sulphonic acid as a test for proteids, dealing particularly with the extreme delicacy, reliability, and simplicity of the test as applied to albumin and globulin, and pointing out its value as affording a ready means of discriminating between (A) the proteids coagulable by heat (albumin, globulin, etc.) or precipitated by neutralisation (acid-albumin and alkali-albumin) on the one hand, and (B) albumoses and peptones on the other. I showed that with the former class of proteids (A) the precipitate formed by the addition of salicyl-sulphonic acid is not redissolved by heating, but, on the other hand, becomes coagulated; while with the second class of proteids (B) the precipitate readily redissolves on heating, to reappear when the fluid cools.

Roch had previously (unknown to me) suggested the application of salicyl-sulphonic acid as a test for albumin. He was unaware that it also precipitates globulins (for example, myosin, serum globulin, etc.), albumoses, etc., and is really a test for proteids, not simply for albumin. His method consisted in the addition of a little of the acid to a portion of the fluid to be examined; the occurrence of a precipitate was taken as indicating the presence of albumin. This was defective, inasmuch as my experiments have shown that the precipitate so formed may be any member of the proteid series, and the subsequent employment of heat is an essential proceeding.

Moreover, the delicacy of Roch's results with albumin itself was greatly lower than what my experiments yielded, and not so high indeed as that afforded by several of the well-known tests already in use. The different results as regards the delicacy of the test for albumin arrived at by Roch and myself probably depend—in part, at least—upon the difference in the methods which we followed. Roch used a comparatively dilute solution or crystals of the acid. I employed a saturated watery solution of the reagent and a smaller amount of the fluid to be tested, and found such a mode of procedure to be much more effective and precise.

My further investigation of the subject has been devoted largely to the uses of salicyl-sulphonic acid in regard to albumoses and peptones.

Albumose.—Primary albumoses are precipitated by the reagent, and heat causes a disappearance of the precipitate, to reappear when the fluid cools. This is a characteristic albumose reaction, and it forms a ready and effective test for the substance. The precipitate is not dissolved by dilution with water and is not soluble in excess of the reagent. This test I have found to be more delicate than the biuret reaction (pink colour with CuSO_4 and KHO), while at the same time the biuret test is not distinctive of albumose, but common to it and peptone. Salicyl-sulphonic acid also constitutes an excellent test for deuto-albumose (secondary albumose) if the fluid to be examined is first mixed with two or three times its bulk of a saturated solution of ammonium sulphate. It is only in presence of such a salt that deuto-albumose is precipitated by the reagent.

Peptone.—Peptone (both peptic and pancreatic) is readily precipitated, as I have already described, by salicyl-sulphonic acid in saturated ammonium sulphate solutions. The precipitate clears up on heating and reappears on cooling. (There can be no confusing this with an albumose precipitate, for, as is well known, albumoses cannot exist in a saturated ammonium sulphate solution, all the albumoses being insoluble in saturated solutions of that salt.) The peptone precipitate is immediately redissolved by the addition of a little water or nitric acid, for as soon as the solution is diluted and the

saturation with ammonium sulphate rendered incomplete, the precipitate dissolves. The presence of any considerable amount of glycerine prevents the appearance of this precipitate.

Again, the precipitate is readily redissolved by adding a further amount of salicyl-sulphonic acid, in marked distinction from the precipitates of the other proteids, which are not soluble in excess of the reagent. It is advisable, then, when testing for peptone in ammonium sulphate solutions to take a very small amount of salicyl-sulphonic acid, and gradually pour in a considerable quantity of the fluid to be examined. This constitutes an easy and accurate test for peptone in saturated ammonium sulphate solutions, a more delicate test than is afforded by the biuret reaction. It is to be noted that the peptone precipitate, like other proteid precipitates formed by salicyl-sulphonic acid, presents the appearance of a uniform opalescence or turbidity throughout the fluid, when the reagent is well mixed with it. Scattered crystalline flakes floating in a clear fluid may appear in strong solutions of ammonium sulphate and other salts, apart from the presence of proteids, but this cannot lead to any error, as it does not in the least resemble the general turbidity at once present with the occurrence of a proteid precipitate.

Further, in addition to showing the presence of peptone in the way described, salicyl-sulphonic acid may be used to separate peptone from the ammonium sulphate solution. The peptone is precipitated, filtered off, washed with a dilute solution of the reagent, and redissolved in a weak solution of an alkali; it is thus virtually freed from ammonium sulphate, and readily gives the biuret and other tests uncomplicated by the presence of saturated ammonium salt.

The fact that peptone is not precipitated by salicyl-sulphonic acid, except when the solution is saturated with ammonium sulphate, is a fact of much importance. For, while fluids saturated with ammonium sulphate (or sodio-magnesian sulphate) can only contain one proteid (peptone), fluids not so saturated may, in addition to other proteids, contain two (peptone and albumose), the reactions of which are for the most part identical, especially peptone and deuto-albumose, both giving the biuret action and many others in common. They are, indeed, at present distinguished from one another only by the fact that the one (albumose) is precipitated by ammonium sulphate, while the other (peptone) is not; this involves the comparatively slow process of saturation with ammonium sulphate. But by means of the saliphonic test it is easy to determine quickly which is present; for albumose gives a precipitate, at least when two-thirds saturated with ammonium sulphate, while peptone does not.

To conclude, salicyl-sulphonic acid serves as an extremely precise, reliable, and quick test for all proteids. And in addition to detecting the presence of proteid matter, the reagent enables one to assign the proteid present to one or other of three classes:

A. *Heat-coagulable proteids (albumin, globulin, myosin, etc.) and derived albumins (acid-albumin and alkali-albumin).* Precipitate does not dissolve on heating, but becomes coagulated.

B. *Albumoses.* Precipitate redissolves on heating, and reappears on cooling. To precipitate deuto-albumose effectively the fluid should first be mixed with twice its bulk of saturated ammonium sulphate solution.

C. *Peptones.* No precipitate, except in solutions already saturated with ammonium sulphate. If other tests (biuret, etc.) show presence of proteid, and no precipitate is given by salicyl-sulphonic acid, the proteid present must be peptone. A precipitate in ammonium sulphate solutions indicates the presence of peptone; it is readily redissolved on the addition of a little water or glycerine.

NOTES OF A CASE OF ACCIDENTAL COW-POX.¹

By E. MANSEL SYMPSON, M.D.,

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As accidental, or, as Ceely calls it, casual cow-pox, is not common, and as with the spread of vaccination and revaccination, more and more perfectly performed—protective not

¹ Read at a meeting of the Midland Branch of the British Medical Association at Gainsborough, Lincolnshire.