iodide, although he did not give it in full doses. Iodide of potassium has also been used with success by Ward of Leeds.⁵² I have heard privately of a few other cases in which the treatment has been successful in some London hospitals, but they are still unpublished.

The mode of action of the drug in actinomycosis is not yet clearly understood. It does not seem to kill or even injure the parasite. Nocard found that a solution of 1 per cent. of iodide of potassium did not check the growth of cultures in an artificial nutrient medium. Netter believes that the remedy has a specific action on the anatomical elements, increasing their power of resistance and thus strengthening the organism in its struggle against the disease. However this may be there can be no doubt of its influence for good. It causes a rapid subsidence of the tumours and nodosities, the parasites are discharged through the sinuses or are absorbed, and ulcerated surfaces heal. In the case above recorded the therapeutic effect was even more striking than that of the drug in tertiary syphilis. The earlier the administration of the iodide is begun the surer and speedier is its action. In order to get the full effect it must be given in full doses. Beginning with ten or fifteen grains three times a day, it should be steadily pushed to twenty, thirty, forty grains, and even larger doses if necessary. The more active the disease the more energetic must be the medication. As a rule the drug is well borne, but if it comes to be what may be called a struggle for life between the remedy and the disease any inconvenience likely to be caused by the former is preferable to the almost certainly fatal effect of the latter. Poncet usually combines local applications of iodide of potassium with its internal administration. He injects a 1 in 100 solution into the sinuses and fistulae or inserts pencils of the iodide resembling those often used for the application of iodoform. Others, as Rydygier, combine interstitial injections of a 1 in 100 solution into the mass with internal medication by iodide of potassium. The average duration of treatment by the internal administration of iodide of potassium is from six weeks to two months. Although the drug may almost be considered a specific it must not be accounted infallible. Poncet records three cases under his own care in which the disease went steadily on to a fatal issue, apparently uncontrolled by the remedy. Dr. D. N. Knox⁵³ has quite recently reported a case in which the drug was equally useless. On the other hand, in estimating the therapeutic efficacy of the iodide it must be borne in mind that there are cases of benign type which have a natural tendency to end in cure. Arsenic has been used alone or combined with iodide of potassium in cases of abdominal actinomycosis (perityphlitis actinomycotica) by Ammendorp⁵⁴ and Tscherning,⁵⁵ both of Copenhagen. In a case under Darier's care, in which the affection was limited to the soft parts of the face, a cure was effected by electro-chemical treatment applied by Gautier;⁵⁶ a solution of iodide of potassium was injected into the diseased tissues, and a current was then passed through so as to decompose the substance and thus utilise the antiseptic power of iodine in its nascent state. Tuberculin was used successfully in one case by Billroth,⁵⁷ and Ziegler⁵⁸ has had good results with the same remedy. Thyroid extract has been employed by Pringle in two cases; one⁵⁹ improved remarkably under the treatment; in the other⁶⁰ the remedy did good at first, but had to be discontinued on account of the untoward symptoms caused by it. In many cases the internal medication must be supplemented by surgical measures. Suppurative foci must be laid open and drained; the walls of chronic sinuses and cavities must be curetted and purified and necrosed bone must be removed; ulcers and wounds must be dealt with on ordinary antiseptic principles. It is hardly within my province, however, to go into details on this subject.

A word or two respecting prophylaxis may not be out of place. Arloing recommends that all animals suffering from actinomycosis in however mild a form should be slaughtered. If this measure is considered too drastic at least the meat from such animals should be carefully inspected, and

the same precautions should be adopted in the cooking of it as are enjoined by Dr. Woodhead⁶¹ relative to tuberculous meat. Milk from animals with "lumpy jaw" or "wooden tongue" should be boiled before use. A word of caution may be added as to the danger of chewing bits of grass or straw, as many people besides ostlers and Lord Palmerston (see Leech's caricatures of that statesman *passim*) are in the habit of doing. As for picking the teeth or clearing out carious cavities with straw—a procedure I have known to be adopted—it can only be described as flying in the face of Providence.

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Harley-street, W.

THE SYMPTOMS AND TREATMENT OF DISEASES OF THE ATTIC (UPPER PART OF THE MIDDLE EAR).

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BEFORE discussing this important subject it would, perhaps, not be out of place to explain and describe a few of the terms used. The attic—also called recessus epitympanicus, or aditus ad antrum, or Kuppelraum—is the upper part of the middle ear and contains the head of the malleus and the greater part of the incus. The tegmen tympani forms the roof and Shrapnell's membrane and a ridge of bone above it form the outer wall. It is divided into several cavities by the ligaments of the malleus and the incus and by folds of mucous membrane, which connect the ossicles with the walls of the attic. These vary to a considerable extent. Shrapnell's membrane is the upper part of the membrana tympani. It is thinner than the lower part or pars tensa, as it consists only of two layers (integumentary and mucous) and lacks the middle or fibrous layer. The attic plays a very important part in connexion with the diseases of the middle ear and mastoid antrum, partly because of its position, as it is practically the connecting link between these two cavities, and partly because of its contents and the arrangement of the same. Inflammation of the middle ear can very readily spread into the attic, and when it has once got into the various cavities it rarely heals spontaneously. This explains why the ossicles and walls of the attic are so frequently diseased. Often there is an accumulation of thickened exudation or pus, or we may find a genuine cholesteatoma. Wall found caseous matter in the attic in forty-four out of sixty-five cases of perforation of Shrapnell's membrane. My own experience quite agrees with these figures. It is difficult to localise the exact seat of the disease. The position of the perforation, however, helps us

⁵² THE LANCET, Jan. 26th, 1895.

⁵³ Glasgow Medical Journal, May, 1897.

⁵⁴ Hospitals Tidende, Band i., p. 518.

⁵⁵ *Ibid.*, p. 520.

⁵⁶ Annales de Dermatologie, 1891, p. 449.

⁵⁷ Wiener Medicinische Presse, 1891, p. 350.

⁵⁸ Münchener Medicinische Wochenschrift, 1892.

⁵⁹ British Journal of Dermatology, January, 1896.

⁶⁰ Transactions of the Royal Medical and Chirurgical Society vol. lxxviii., 1895.

⁶¹ See Report of Royal Commission on Tuberculosis.

to some extent. If it is over the short process of the malleus then the head of the malleus is affected; if behind, the long process of the incus; whereas if the walls of the attic are diseased there is a large perforation in the upper part of Shrapnell's membrane. In all cases of perforation of the lower part of the membrana tympani, in which ordinary treatment (removal of granulations, local applications, &c.) has failed to effect a cure in a few months, we can be nearly sure that the attic is diseased—especially in adults—and perhaps also the mastoid cells. In adults we nearly always find that if the mastoid cells are affected the attic is also diseased. This is of great importance in the surgical treatment of the diseased mastoid process. It is the reason why Schwartz's original operation is frequently so unsuccessful: because we do not lay open and treat the diseased attic. This naturally keeps up the otorrhoea and often causes recurrence of the mastoid disease.

The symptoms of disease of the attic are chiefly objective. We in most cases find perforation of Shrapnell's membrane or of the pars tensa with or without granulations. We can have simple accumulation of pus, or a cholesteatoma, or caries of the ossicles or of the wall of the attic. Frequently granulation tissue projects through the perforation of Shrapnell's membrane and may attain large dimensions. Often we find a small, dark crust which covers the perforation and which is often mistaken for cerumen. These cases are frequently overlooked, and yet it is of great importance that they should be diagnosed, as the crust naturally causes retention of pus. It very readily re-forms when removed. We can have disease of the attic without perforation of the membrana tympani. In my experience these cases are not at all uncommon. The patient complains of pain in or above the ear, of a feeling of fullness, not always of deafness. We find redness and slight bulging of Shrapnell's membrane or of the upper part of the external meatus. Frequently in chronic cases there is swelling above the auricle, extending forwards and backwards, often as far as the apex of the mastoid process, and thus simulating disease of the antrum. I have recently operated on a man aged thirty years who for twenty years has had discharge from the right ear. On three occasions he had Wilde's incision performed for mastoid abscess. I was much surprised to find the mastoid process apparently normal and a large cholesteatoma of the attic.

Pain, of course, is a common symptom and it varies with the nature of the disease. I have seen several cases in which the only symptoms were frequent attacks of dull, aching pain, with slight bulging of Shrapnell's membrane, with no marked deafness. I incised, found caseous matter, and scraped and syringed out with excellent results. Often there are shooting pains which radiate chiefly upwards and forwards. In all cases of mastoid disease with pain above and in front of the ear, especially if there is any swelling there, we should carefully examine the attic. As regards treatment, I think that we should be guided by ordinary surgical principles: enlarge the perforation, excise part of the membrana tympani (if necessary), remove any granulations and caseous matter by the curette and the syringe, and apply chromic acid, iodoform, aristol, &c., taking care, of course, that the perforation be kept well open. If the malleus or incus is diseased and loose they can easily be removed. If they are firmly attached or difficult to find, it is best to wait awhile before attempting to remove them. We then do not incur the great risk of damaging the stapes or the facial or semicircular canals. I use Delstanche's or Hartmann's or Milligan's irrigator for washing out the attic and Delstanche's new curette for removing the malleus. I believe that if these simple methods of treatment were more thoroughly carried out we should not hear so much of the wonderful operations for removing the ossicles under chloroform or of opening up the attic. Out of forty-two private cases of perforation of Shrapnell's membrane I have only twice removed the ossicles under chloroform and opened up the attic in ten cases. In the remaining thirty cases free incision, syringing, and scraping effected a cure. The incus is often dislocated or absent.

If these ordinary methods and the removal of the ossicles fail to effect a cure, or if the external meatus is too narrow to apply local treatment, we must open up and explore the attic. I make a long incision behind and round the top of the ear down to the tragus, cut through the external meatus, and pull the whole of the ear downwards. The wound is dressed from above and allowed to heal from below. There is very little deformity, and a much better view is retained of the diseased parts during

the period of healing. If a permanent fistula has to be retained it is for obvious reasons much more desirable that this should be above and not behind the ear. I always remove the outer wall of the attic and the posterior wall of the external meatus with the chisel. Macewen, Barr, and others recommend the use of the burr and dental engine. I have not yet been able to find burrs which bite properly on the hard bone, and the operation thus becomes very tedious. We frequently find a number of mastoid cells on a level with the attic. In all operations these should most carefully be looked for, and if necessary opened up and scraped. If they are overlooked the disease is sure to recur.

The after-treatment is often very tedious. I have generally kept the outside wound open for a month or two, and if necessary allowed a permanent opening to form. In a few recent cases I have adopted the method of incising the external meatus and forming it into a flap or flaps, or of excising part of the meatus. A very large external meatus is thus obtained and the diseased parts can easily be watched through it; apply remedies locally, and thus allow the outside wound to heal up at once. I apply iodoform for a few days after the operation and then use aristol or euophen. Iodoform has a tendency to cause increased growth of granulation tissue, which blocks up the field of operation.

The facts to which I should have liked to draw particular attention are: (1) that localised disease of the attic is very common—more so than is generally supposed—and that it may occur without perforation of the membrana tympani; (2) that in cases of chronic otorrhoea which have for some time resisted the ordinary methods of treatment, and in disease of the mastoid antrum in adults, the attic is nearly always affected; (3) that in all cases of disease of the attic we should adopt ordinary simple surgical treatment before removing the ossicles under chloroform or opening up the attic; (4) that in opening up the attic we should prolong the incision over the top of the auricle downwards to the tragus and treat the wound from above; (5) that in suitable cases the external meatus should be partly excised or incised, and flaps formed and the outer wound allowed to heal up at once; and (6) that we should always remove the outer wall of the attic and the posterior wall of the external meatus and carefully look for any mastoid cells which may be on a level with the attic.

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OPERATION FOR THE CURE OF VESICO-VAGINAL FISTULA.

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So far as I know two operations are performed for the cure of vesico-vaginal fistula—(1) the ordinary operation, and (2) Mr. Lawson Tait's operation. In the latter the edges of the fistula are split all round, the bladder edges turned forward and the vaginal edges backwards, and the raw surfaces between the two are brought into apposition by sutures limited to the freshened areas. The description of both operations is as simple as the execution of them is difficult. The chief risk of both is that one or more sutures may be left projecting into the bladder, and there are several objections to either. To bring linear surfaces into such accurate contact that no leakage can occur is too much to expect from an ordinary operator; and if this difficulty is overcome the sutures are apt to cause trouble from the dragging to which they are subjected by the normally tense vaginal wall. Then the thick unyielding vaginal wall, the larger size of the opening on the bladder side, and the depth of the bladder wound make satisfactory closure of the fistula in the bladder without perforation almost impossible. Some leakage into the wound from the bladder side is more than likely to occur. My notion is that to operate in these cases with the greatest probability of success the same principle must be applied that has revolutionised the treatment of intestinal fistula. The opening of the bladder must, like that in the intestines, be freely exposed, and in the former, as in the latter, complete closure of the visceral opening should be regarded as the key to a successful result. There are two anatomical points which may be noticed as bearing upon my operation: (1) that the