question of consideration whether to take the uncertain way of relief by general measures or the more certain but troublesome one of radical cure by treatment of the focal disease.

SECTION OF OTOTOLOGY.

President: WILLIAM MILLIGAN, M.D.

REMARKS ON CHOLESTEATOMA OF THE MIDDLE EAR.

BY DUNDAS GRANT, M.D., F.R.C.S.

IT must have happened to all who have had much experience in otology to have met with one or two cases in which the attic of the tympanum is lying freely open, the outer wall having completely disappeared, while the cavity is entirely lined by a smooth, pearly-white membrane. Occasionally the loss of bone extends to the postero-superior wall of the osseous meatus, leaving an opening through which a cavity much larger than the antrum, though including this, is visible, the walls being covered by the same kind of shiny, pearly-white membrane. The patient, though dull of hearing in that ear, may be free from all discomfort, except the occasional accumulation of desquamative epithelial products, which are easily removed. In such cases there has generally been a history of chronic suppurative inflammation of the middle ear of several years' duration, characterized by the occasional occurrence of severe headaches and the extrusion of white, macerated, skin-like formations.

The course of events in such cases has been the development of the so-called cholesteatoma, consisting essentially of a membrane lining the natural or pathological cavity in the petrous bone, desquamating so that the cavity is filled with epidermoid scales, the central ones of which have broken down into cheesy masses containing cholesterin crystals. Under the influence of moisture or inflammation the desquamation is increased, and the cavity thereby filled and distended; the pressure causes the walls of this to give way at their weakest part, and if, as in the fortunate cases we are describing, this is the part presenting towards the tympanum and external meatus, the bone in those places is gradually eroded until the cavity is laid so freely open that there is sufficient room for the exit of the contents.

The course of formation of such a cholesteatoma appears to be

as follows: As the result of a suppurative inflammation extending into the antrum and adjacent cavities, the lining membrane becomes covered with granulations similar to those on an ulcer on the surface of the body; in some cases, especially the tubercular ones, progressive caries of bone results, and very little or no attempt at healing takes place. In the absence, however, of such a dyscrasia, the smaller bony trabeculae give way, and a comparatively large cavity remains, lined with granulation tissue. As the suppuration subsides, the edges of the perforation in the tympanic membrane may become cicatrized, and it is possible for the granulations to disappear, and a return to a fairly normal mucous membrane be effected. Should, however, the perforation in the membrane be peripheral, and there be a ready continuity between the epithelium of its outer surface and the granulations on the wall of the tympanic cavity, the same changes take place as on the surface of a healing ulcer on the leg. The cuticular epithelium proliferates over the granulations from the periphery onwards, until the whole ulcer, if not too large, is covered with a cicatrix, which may be a fair substitute for skin.

In the middle ear this process has been traced, as shown by microscopical examination, to a considerable extent into the tympanic cavity; there is no reason why it should not continue through the aditus into the antrum, at first reaching only those portions of the walls of the cavity which are nearest this orifice, then gradually extending over the parietes until the whole cavity is lined with an epithelial cicatrix. Sometimes in performing the radical mastoid operation one finds the cavity in this condition. At other times, as in a case I operated on a few days ago, the part nearest the mastoid surface is filled with granulation tissue, and the shiny cholesteatoma membrane is found on the inner wall of the antrum and the portions adjacent to the aditus. Probably in this case the epidermization was gradually extending towards the remoter spaces, and in time would probably have eventuated in the formation of a typical cholesteatoma. Of course, it would be impossible to predict whether this would be favourable or unfavourable to the patient's life, as the centrifugal pressure exerted by it might result in erosion of the bone in the direction of the lateral sinus or the other cranial contents. If the circumstances were favourable, and the *locus minoris resistentiae* was in the direction of the tympanum and external auditory meatus, the bone might give way, as in the instance I first quoted, and the contents of the cavity find their way into the outer passage of the ear. The lining of the cavities thus exposed is sometimes as perfect as could be desired,

and, when freely exposed to the drying influence of the air, and kept dry by exposure to the air, the avoidance of the introduction of water, and the use of alcoholic instillations, the patient's condition may be one of complete comfort and safety. The main postulate is that the opening should be sufficiently wide for the entrance of air and for the immediate escape of desquamative products. It need hardly be said that it is only in exceptional cases that this takes place spontaneously in the favourable direction, and, as soon as the condition of cholesteatoma is recognised, the surgeon should be ready to carry out the operation necessary for its free opening.

In the absence of such evidences of pressure as pain, vertigo, and bulging of the postero-superior wall of the meatus, he is justified in giving a trial to such dehydrating measures as the instillation or injection of alcohol in the form of rectified spirit, which may at first be diluted to the extent of 50 per cent. This preliminary treatment is all the more called for, inasmuch as it is difficult, and perhaps impossible, to say beforehand how far the desquamating membrane extends into the mastoid cavities, and if this extension is very limited the necessity for operation may not arise. On the other hand, in the presence of pressure symptoms no delay is permissible, and a free opening, after the manner so well formulated by Stacke, is called for. If when this opening has been made it is found that the cholesteatomatous condition does not extend deeply into the cavities, but that they are filled with granulation tissue and broken-down bone, the hole should be thoroughly scraped out and suitable plastic arrangements for lining the cavity adopted. If the cavity is very small, any of the various well-known flaps may be formed and cicatrization over the granulating surface encouraged, the rapidity of healing being in proportion to the smallness of the area which has to heal. Should the cavity be fairly large, I have no hesitation in saying that it should be lined by means of Thiersch's skin grafts, according to the technique so perfectly devised by Ballance. Even in the hands of one who is only moderately expert in the technicalities of this process, the results far surpass those obtainable without it in cavities of the same size.

In those cases, however, in which the cicatricial process has extended over the whole of the walls of the cavity, I venture to believe that we have already to hand as good a lining as we can desire, and that it is not merely a justifiable, but a very desirable economy of the patient's time and tissue to preserve and make the most of the lining in question. I have in several cases put this

principle into practice, and found a complete healing of the parts and drying-up of the discharge produced with a rapidity and ease unequalled in other cases. In such cases I content myself with gently scraping out the contents of the cholesteatomatous cavity and leaving the white, shiny membrane *in situ*, swabbing it carefully but thoroughly with rectified spirit. In my last case I then insufflated a quantity of sterilized aristol, a substance recommended by Mr. Ballance for use when plugging the cavity he has lined with Thiersch grafts, applying over this a light tampon of iodoform gauze, and, after about a week, starting the instillation of alcoholic drops.

In cases—and there are such—in which a shiny, uniform membrane is found lining the cholesteatoma cavity I see every reason to think that this should be preserved, instead of being scraped out, as is recommended by most operators up to the present. Should the membrane be pulpy, imperfect, and not homogeneous, I am equally convinced that it is our duty to practice complete erosion, and to line the cavity by transplantation of a skin graft.

DISCUSSION.

Dr. URBAN PRITCHARD said: In my opinion, the enlargement of the antrum and mastoid cells in a typical case of cholesteatoma is chiefly due to pressure, and not to ulceration of the bone, as is the case in ordinary mastoid disease. This is proved by the hardness and smoothness of the bony walls of the cavity, which is, moreover, lined by a thin altered mucous membrane. At the same time, I agree that there are always some spots of ulceration to be found.

Dr. McBRIDE said that, according to Habermann, cholesteatomata originated from ingrowing of epidermis through a perforated membrane, and that the epidermis seemed to take on an unhealthy growth. For these reasons he deemed it inadvisable to leave the matrix.

Mr. C. H. FAGGE did not agree with Dr. Dundas Grant's view that the cavity was lined with a pearly membrane. He said it never was complete, and that there was always ulceration somewhere. The membrane was a thinned-out skin growing in from the surface, and persisting within the antro-attico-tympanic cavity altered by inflammation, and was different from what had been described as the matrix, which was merely the outer layers of the cholesteatomatous mass overlying the ulcerating patches. He personally did not agree with the mechanical view of erosion of

bone in cholesteatoma, as it often occurred without blockage of the external orifice, as in cases of caries with large postnasal or meatal openings. He considered it to be a chronic infective ulceration, absolutely independent of pressure.

Dr. DUNDAS GRANT, in reply, denied that in all cases of cholesteatoma there was coexistent ulceration. In complete cases the pre-existent ulceration had healed. He had not committed himself to the opinion that the dilatation of the cavity might not be in part the result of infective ulceration, but he was in favour of the view that it was mainly attributable to pressure, such as was exercised by an aneurism when it eroded the sternum, or by cholesteomata of the external auditory meatus on the bony walls of that passage. He was glad to find Dr. Pritchard's views so closely coincided with his own. He looked on cholesteatoma as a "desquamative dermatitis," the stages being the formation of a derma lining the cavity, then the inflammation of this derma resulting in desquamation, and the agmination of desquamative products.

SOCIETIES' PROCEEDINGS.

EIGHTH ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Held in Washington, D.C., June 2, 3, and 4, 1902.

President: CHARLES W. RICHARDSON, M.D., of Washington, D.C.

(Continued from page 488.)

Dr. EDWARD B. DENCH (New York) read a paper upon *Various Operative Procedures for the Relief of Chronic Suppurative Otitis Media and their Comparative Value.*

In a consideration of the topic he confined his remarks to those cases of long standing in which suppuration had persisted in spite of the ordinary measures for relief. In all cases the cause of the otorrhœa was diseased bone within the tympanic cavity. In order to effect a permanent cure, it was necessary that all diseased foci should be removed, and that any wound resulting from the surgical interference should be made to heal as quickly as possible, in order that all regions previously diseased might be quickly covered with normal epithelium. In cases where the caries was confined, either