Sensitivity Tests.—Selected strains isolated from both patients were tested for sensitivity to penicillin, streptomycin, and sulphadiazine by the Moersch-Lund (1949) method and in the case of penicillin by dilution technique also. The first strain isolated from Case 1 was very sensitive to penicillin (+++), less so to sulphadiazine (++), and resistant to streptomycin. The second and third strains, isolated during treatment with penicillin, were rather less sensitive to penicillin (++), and those obtained after treatment ceased (32 million units) showed a similar sensitivity. The first strain derived from Case 2 showed a similar sensitivity to penicillin (+++). The minimal inhibiting concentrations of penicillin were estimated by the usual dilution technique. These were: 0.4 unit for the first strain, 1 unit for the second isolation, and 5 units for the third. The strain isolated from Case 2 was inhibited by 0.3 unit.

Serological Tests.—Limited serological studies were carried out. Serum taken from the first patient about five weeks after admission to hospital showed an agglutinating titre of 1/40 against the homologous organism. Normal control sera gave negative results. No complement-fixation tests were carried out. In the case of the second patient, a serum specimen taken five months after operation gave quite negative results in both agglutination and complement-fixation tests.

Discussion

Although the organisms isolated conform to the general characters of *Past. multocida*, their precise relationship to the disease processes present in the patients is less certain. In Case 1 it is impossible to say whether the infection with *Past. multocida* preceded the bronchiectasis or vice versa, and the situation is made more difficult by the progressive character of this disease, irrespective of the presence or absence of the causative agent. The second case is very similar to that described by Bartley and Hunter (1947), and seems to be the second example in the literature of sinusitis due to an organism of the *Pasteurella* group. These authors describe a case of frontal sinusitis of long duration from which *Past. multocida* was isolated which did not react to penicillin but responded to operation. It seems reasonable to assume that in both these patients the cause of the sinusitis was *Past. multocida*. Determination of the source of the infection is also a difficult problem. In some instances it has been possible to establish a connexion with the bite of an animal, but in the absence of any such significant event in the patient's history there remain as guides only the biochemical characters of the organism isolated and the species pathogenicity. Pestana and Rugai (1943) stated that 96.88% of strains isolated from birds fermented arabinose, while those from mammals failed to do so. Stamatin (personal communication, 1951) stated that avian strains ferment arabinose but not xylose, while mammalian ferment xylose but not arabinose. The first patient had a history of animal bite and of contact with diseased poultry and with rats and mice before the onset of symptoms, thus giving a wide but vague range of possible sources of infection, but in Case 2 no such data were provided. Moreover, although the fermentation reactions in both cases are of the avian type, the strains were avirulent for pigeons. In the reports in the literature of *Past. multocida* isolated from human beings the strains obtained cannot readily be classified into two fermenting groups, for some fail to ferment both arabinose and xylose (Regamey, 1938, 1939; Le Chuiton *et al.*, 1939; Cooper and Moore, 1945), while others (Bartley and Hunter, 1947; Svendsen, 1947) attack both these carbohydrates. Stamatin's classification, therefore, although applicable to strains obtained from birds and mammals, cannot necessarily be applied to those isolated from cases of human pasteurellosis.

Summary

Two cases of human pasteurellosis, one with bronchiectasis, the other with maxillary sinusitis, are described from which almost identical strains of *Past. multocida*

were isolated. Although the organisms were sensitive to penicillin *in vitro*, penicillin treatment was without success. Detailed descriptions of the strains and a discussion of the literature on the subject are given.

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IMPROVEMENT OF HEARING IN MALFORMATION OF THE EXTERNAL AUDITORY MEATUS AND MIDDLE EAR

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Congenital malformation of the pinna, auditory meatus, and middle ear is a comparatively uncommon condition which presents a functional as well as an aesthetic problem. The surgical techniques for reconstruction of the pinna are well recognized and regularly practised, but the measures for improving the hearing are perhaps not so readily appreciated.

In most cases of malformation of the external meatus and middle ear the internal ear with its contained organ of hearing is intact. The absence of any conducting mechanism reduces the hearing to practically a non-existent level. If a new meatus can improve hearing for speech to about 3 feet (90 cm.), the addition of a window in the bony external canal, as in the fenestration operation for otosclerosis, may produce much better hearing. Such procedures have already been reported by Ombredanne (1944, 1947) and others, and the following case record confirms their value.

Case Report

A boy aged 5 was first seen at the Hospital for Sick Children on April 21, 1951. The outward appearance was as shown in the photograph. The pinna was malformed on the left side and the external auditory meatus absent. The right ear was normal. There was no perception of the spoken voice in the left ear with the right meatus occluded. So far as could be ascertained bone conduction by fork-testing was normal on the left side, but the child was not a good witness. X-ray investigation revealed the presence of semicircular canals.

It was thought justifiable in this case to attempt the restoration of hearing in the left ear by a modified fenestration technique. The matter was fully ex-

Photograph showing malformed pinna and absence of external auditory meatus.

plained to the mother, with stress on the possibility later of closure both of the fenestra in the lateral canal and of the newly constituted auditory meatus. It was realized that the degree of hearing to be expected could not be as great as that following fenestration or otosclerosis, in which there is a normal tympanic membrane and auditory canal. The mechanism of hearing in this child's left ear would be by direct impact of sound waves upon that part of the skin graft covering the fenestra in the lateral canal.

Operation was performed on September 4. A post-aural incision, situated far back behind the hair line, was used in order to interfere as little as possible with the skin that was required for the later reconstruction of the pinna. Outwardly the mastoid process appeared fairly normal, but there was no cartilaginous or bony external auditory meatus. After opening the mastoid process the bony external semicircular canal was identified and further exposed. Neither malleus nor incus was seen, but the stapes was present though immobile. A fenestra was made in the bony external semicircular canal, and this was covered with a thin free skin graft. The bony bed on which the graft was to lie was then carefully smoothed by means of a dental polishing burr, and the graft shaped to lie closely over the fenestra in the canal and on the bony bed so prepared.

The new external auditory meatus was then made by removing a circle of skin in the appropriate spot. A large amount of skin was cut away to allow for later contraction. The tissue underlying the skin was completely removed, so that free access was obtained down to the mastoid cavity. Previous experience of rapid closure of these artificial openings led me to line the superior quadrant of the circle with the temporalis fascia swung down on a hinge, and the postero-inferior quadrant with mastoid periosteum swung forward from a hinge on the mastoid tip. Another free skin graft was then cut and the newly constituted auditory meatus lined completely with this. A plastic tube of suitable size, lined outwardly with "tulle gras," was then inserted.

A piece of nylon was placed over the skin graft in the mastoid cavity, and a pack on this, and the post-aural wound was closed completely. There was little constitutional upset after the operation, and one week later the packs and nylon from the mastoid cavity were removed. The tube and tulle gras in the external auditory meatus were left *in situ* for a few more days. The wound healed by first intention.

On September 15 a conversational voice was appreciated in the left ear at a distance of 12 feet (3.7 metres), and this improvement has so far been maintained. The external auditory meatus has contracted considerably, but it is fully lined with skin, and should remain patent without further contracture. To discourage further contracture a small plastic tube is worn in the external meatus. The mastoid cavity is clean, and the skin graft has taken completely.

It has still to be seen whether the fenestra in the external canal will remain patent, and the reconstruction of the pinna has yet to be carried out.

I am grateful to Mr. Terence Cawthorne for helpful criticism of this case report. Mr. Derek Martin, of the Photographic Department, Hospital for Sick Children, Great Ormond Street, is responsible for the photograph.

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UNILATERAL AMAUROSIS WITH PARTIAL RECOVERY AFTER USING HEXAMETHONIUM IODIDE

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The methonium compounds have now been in use for some two and a half years in various spheres of general surgery to provide a relatively bloodless operative field and to prevent excessive loss of blood. Several more or less enthusiastic reports have appeared; the possible disadvantages and dangers have been discussed, but so far as we can ascertain no complications have been reported in the literature. The following case is recorded because we feel that there is a reasonable presumption that the use of hexamethonium iodide in an uncomplicated case of radical mastectomy led to a potentially serious vascular complication in the eye.

Case Report

This patient, a woman aged 42, had stage 1 carcinoma of the left breast, with slight exophthalmos, but no other appreciable disease. Her blood pressure was 135/85.

At 9.45 a.m. anaesthesia was induced with thiopentone and gallamine triethiodide by oral endotracheal tube under face-piece. Maintenance was by N_2O , O_2 , and trichlorethylene with intermittent thiopentone. Induction was uneventful. A frozen section was taken. At about 10.30 a.m. hexamethonium iodide, 60 mg., was given and the patient was put in the 15-degrees anti-Trendelenburg position. B.P. fell in four minutes to 75/55, and shortly afterwards slowly rose again. At approximately 10.45 a.m. hexamethonium iodide, 40 mg., was given. B.P. fell to 70/55, but soon returned to 75/55. Bleeding was only moderately reduced. At the end of the operation about 11.45 a.m., the blood pressure was 85/70. No methylamphetamine hydrochloride was given, as it was thought to be unnecessary.

Shortly after recovering consciousness the patient stated that she could not see with her left eye. On ocular examination a few hours later neither eye showed any abnormality of the conjunctiva, cornea, or of ocular movements, and the right eye was found to be normal in all other respects, with a full field of vision to confrontation tests. The right pupil failed, however, to react to consensual stimuli. The left pupil reacted briskly to consensual stimuli and normally on accommodation, but reacted minimally to direct light. In the left fundus the disk was normal, the arteries and veins were of normal calibre and equal to those in the right eye. Circulation appeared to be normal as judged by the appearance of first venous and then arterial pulsation on applying increasing external pressure to the globe, there was no evidence of any embolus in the arterial branches, which were followed out to the periphery of the fundus, and the macular area appeared normal. The ocular tension was normal, and vision was reduced to perception of light in the central area of the visual field. No local treatment such as paracentesis was thought advisable or necessary, but the patient was put on tolazoline hydrochloride, 25 mg. four times daily. This was continued for a week.

On the following day the left vision had improved to perception of light over the whole visual field, while the patient

There are 727 doctors in Bolivia, mostly concentrated in towns, and two-thirds of the three million inhabitants live in the country (*Presse Médicale*, October 4). As there is little hospital accommodation in the country (about 1.5 beds per 1,000 of the population) many infectious diseases have to be treated at home. There is also a shortage of maternity beds. The State has only 362, and private hospitals devote half their total of 1,061 to maternity cases. Several hospitals are being built; at La Paz there is to be one for children, with 200 beds, and another for tuberculous patients.