SOCIETIES' PROCEEDINGS

SECTION OF OTOLOGY—ROYAL SOCIETY OF MEDICINE.

President.—J. S. FRASER, F.R.C.S.E.

February 4, 1928.

The Bactericidal Power of Human Blood and some Methods of Altering it. ALEXANDER FLEMING, F.R.C.S. The Paper is published in the *Journal of Laryngology and Otology*, Vol. xlii., p. 385, June 1928.

DISCUSSION.

Mr W. STUART-LOW said that the advantages of using blood-serum as a first dressing in mastoid operations were very great. The chief objection to even mild antiseptics had always been that they had some irritative and devitalizing effect on the tissues and there was no certainty that micro-organisms were destroyed by their action. No doubt the beneficial action of some antiseptics, and probably also of some aseptics, such as normal saline solution, consisted in the fact that they irritated the tissue and in this way ensured an increased outflow of serous fluid and stimulated the circulation about the healing parts. To supply the blood-serum without applying the irritant was better.

Mr SOMERVILLE HASTINGS asked whether Mr Fleming had used salt injections clinically in cases of septicæmia and special infections, and, if so, what had been the result.

Mr F. B. GILHESPY asked whether the use of such anticoagulants as heparin exerted any deleterious effects on the leucocytes.

Mr SYDNEY SCOTT said he had never heard stronger reasons for so-called aseptic surgery.

Sir CHARLES BALLANCE said that his own experience of direct transfusion of blood was that, in acute cases it never saved a life. He had also used hypertonic salt solution in very bad cases, and its use had been followed by improvement. The reason for this had been explained by Mr Fleming. In a number of desperate cases he (Sir Charles) had employed mercuric chloride, following Professor Cash, of Aberdeen, who had used mercuric chloride intravenously to cure animals suffering from infection with septic organisms. During the War he (the speaker) had found that it was the only thing of use, and in some desperate cases it had quite clearly saved lives. He commenced with 6 c.c. of 1 in 1,000 solution diluted with one or two ounces of salt solution, and injected it slowly. In some instances the injection was given each day for three or four days. In some cases the temperature when the patients were seen

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

was 105° F., even 106°, with rigors and in some he had only to give one injection. He would like an explanation of the result from Mr Fleming, as he did not think the mercury remained in the blood very long and was certainly not in sufficient strength in solution to arrest bacterial action. He thought perhaps that the mercury formed a combination with the albumin of the plasma, and that this kept it longer in the blood than would otherwise have been the case. However, what Mr Fleming had now told the Section enabled one to appreciate the wonderful results sometimes obtained after the intravenous injection of arsenical compounds, and the same explanation may hold good for mercuric chloride. In some way or other not yet clearly understood, the antibacterial power of the leucocytes or plasma, or both, were increased.

Mr J. S. FRASER (President) said that he had had some experience of these various methods of treatment in such conditions as sinus thrombosis, aural bacteriæmia, meningitis, etc., and he had made an analysis of thirteen treated cases. Two patients were treated with the fluid S.U.P.; both had died. One was treated with mercurochrome and died, the death apparently having been accelerated by the intravenous injection. Two were treated with hypertonic salt solution; both recovered. Of eight patients treated with septicemine, three recovered and five died. It was a small number of cases on which to base any conclusion, but in that series hypertonic salt solution had given the best results.

Mr FLEMING (in reply) said the question regarding the intravenous use of hypertonic salt clinically had been answered by the President. His own experience with it had been only slight. He had experimented with it on animals, and he hoped it would be used clinically, as it was perfectly safe, and it seemed reasonable that it should do good.

Heparin had no deleterious effect on the leucocytes in the concentration required to stop clotting of the blood. Intravenous injections of mercuric chloride have been used for a long time in the treatment of acute infections, but they have been used with the intention of directly killing or inhibiting the microbes by the chemical. In water it was a very potent antiseptic, but when added to blood its power was much reduced and in any concentration which could be injected it would not by itself kill the bacteria.

Whatever lethal action it had was exerted in association with leucocytes and was more or less specific for hæmolytic streptococci.

Methods of Estimating Certain Alterations in the Middle-Ear by Means of Quantitative Tests of Hearing—A. LOWNDES YATES, F.R.C.S.E.—The Paper is published in the *Journal of Laryngology and Otology*, Vol. xlii., p. 398, June 1928.

DISCUSSION.

Sir JAMES DUNDAS-GRANT thanked Mr Yates for his reference to some work which he (the speaker) had done many years ago. He had been much indebted to the late Dr Womack. It was necessary to make out the logarithmic rate of decrement in each particular fork. Dr Womack had worked that out with him, and the result was published in the "Report

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

of the Ninth International Congress on Otology," Boston, 1912. It was shown to be a scientific method of testing the length of time that a 100 per cent. hearer was able to hear the fork after the patient had ceased to hear it; it was not necessary that the test should be during the fork's maximum amplitude, but at any part, thus eliminating the need of giving the fork the smartest possible blow. The amplitude (A) after a certain time (t) was equal to the original amplitude (A_o) multiplied by "e" to the power of $-\frac{K}{2}t$, K being the logarithmic rate of decrement per second.

It was found that the ratio of acuteness of auditory perception depended only on the difference of duration of hearing, and on the constant K; *i.e.*, it was something which could be measured by physical methods in any physical laboratory, and the results and various differences could be calculated by any who were skilled in the business use of logarithms. Hartmann's chart gave only the *duration* of a normal person's hearing of a fork after the patient heard it no longer. He, the speaker, with Dr Womack, had worked out a chart corrected to show the differences in actual *degrees of hearing* for each fork. They got a formula for air conduction only, because bone conduction needed a good deal of discrimination. A complete examination of both ears occupied about twenty minutes.

Acute Suppuration of the Middle-Ear with Comparative Absence of Aural Symptoms: Thrombophlebitis of Lateral Sinus: Operation: Recovery. — Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Boy, aged 9, was sent to a convalescent home on account of debility, and was returned on account of rises of temperature and increased constitutional disturbance; he made no complaint of ear symptoms, but my colleague, Mr Tudor Edwards (who saw him on account of glandular swelling in the neck), considered the temperature curve like that of lateral sinus phlebitis. I found a "quiet" bulging of the posterior part of the right tympanic membrane, and Mr Ormerod confirmed my observation. Puncturing the membrane evacuated a drop of bright mucopus. I then opened the mastoid by Schwartze's method and, as the symptoms persisted, exposed and evacuated the sigmoid sinus, and afterwards the jugular vein in the neck. This, which was thickened and filled with the remains of clot, was divided as low down as possible, and brought out on to the surface of the neck. I introduced a catheter up as far as the roof of the jugular bulb, practised suction and gentle syringing, and effected a communication between the mastoid and the cervical orifices of the tube. The patient made a gradual recovery, having a voracious appetite throughout. The tympanic membrane healed up completely, and when last seen the hearing was good. No radical mastoid operation was performed.

Mr W. STUART-LOW said that he would like to have seen the temperature chart and a report of the examination of the blood. Recently

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

two of his own patients had recovered without operation after having had temperatures ranging from 102° to 105° F. with well-marked rigors, and streptococci had been found in the blood.

Collargol ointment applied lightly, freely, and frequently to the neck on the affected side was readily absorbed through the skin, and by way of lymphatics and blood-stream helped to retard and resolve the septic clot in the jugular vein. Large doses of the old Edinburgh tincture of iron combined with 5 gr. of quinine, which had a specific action against streptococci in the blood, were most useful, as, doubtless, such cases were pathologically erysipelatous in nature. The employment of an anti-streptococcal vaccine or serum was frequently indicated, as this had been proved to prevent the formation of secondary foci.

Supernumerary Auricle on Left Side and Congenital Malformation of Right Cheek.—H. NORMAN BARNETT, F.R.C.S.E. —Girl, aged 11, had one brother who died at two years being unable to talk or use his legs; her mother thinks the patient was deaf.

Personal History.—The mother considers that the child was always deaf to some extent, but her deafness was made worse by recent cold, and she has not recovered her former hearing.

Examination. — Supernumerary auricle on left side, and a rudimentary structure in the centre of the right cheek.

Hearing.—Right ear: B. C. + 1; R. – ; T. F. (256) – 15; watch $\frac{64}{160}$; conversational voice, 16 ft.; wh. 12 ft.; Gellé positive; Weber to right; left ear: B. C. + 3; R. – ; T. F. – 35; watch $\frac{9}{160}$; conversational voice, 6 ft.; wh. 1 ft.; Gellé positive.

No tinnitus is complained of. Tympanic membranes fairly normal, but slight reddening on left side. Eustachian tubes are clear.

The questions that arise are: to what is the deafness due—congenital defect in inner ear or otosclerosis? What is the structure on the right cheek?

Mr BANKS-DAVIS said that the malformation on the right cheek appeared to him like a cyst.

Mr NORMAN BARNETT (in reply) said he thought the defect on the right cheek was some cartilaginous, congenital remnant quite distinct from the auricle, but he was not certain. His chief object, however, in showing the case was to obtain the opinion of members as to whether the deafness was due to congenital causes in the inner ear or to otosclerosis. Judging from the family and personal history, he thought it probable that it was due to the former cause.

The radiographer, Dr Preston King, was convinced that the bone on the more affected side was of a different type from that on the other, being less compact.

Gunshot-Wound causing Complete Deafness of Right Ear. —H. J. BANKS-DAVIS, F.R.C.P.—Male, aged 30, had a gunshot-wound

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

in the face causing loss of the right eye and complete deafness of the right ear with facial paralysis.

A mastoid operation was performed in 1916.

There is a sinus in the corner of the right orbit communicating with the ethmoid cells which has never healed.

The patient on smoking a cigarette can blow the smoke with great force horizontally through this aperture.

Loss of Function in Left Internal Ear and Labyrinth caused by War Injury.—H. J. BANKS-DAVIS, F.R.C.P.—Male, aged 37, a first class draughtsman in the Civil Service was, in 1915, supposed to have a "fractured skull."

There is a depression over the left temporal bone and left vault of the skull. He thinks he was struck by a shell, but the military report states that it was due to a kick from his horse. The integument was not broken.

The left internal ear and labyrinth are functionless, presumably due to laceration of the eighth nerve. The facial nerve has escaped and there has never been any facial distortion.

The hearing power in the right ear is unusually acute.

He states that for a considerable time after his injury he "used to bear to the left in walking and constantly walked into people on the sidewalk," in spite of all efforts to avoid them.

The patient is now seen twelve years after his injury. The fracture implicated the auditory nerve only, and the facial nerve escaped injury. In the first of the two cases exhibited both nerves were implicated. For a long time after the accident the second patient was giddy, and tended to walk to one side. In walking, these cases tended to edge towards the ear which had been destroyed.

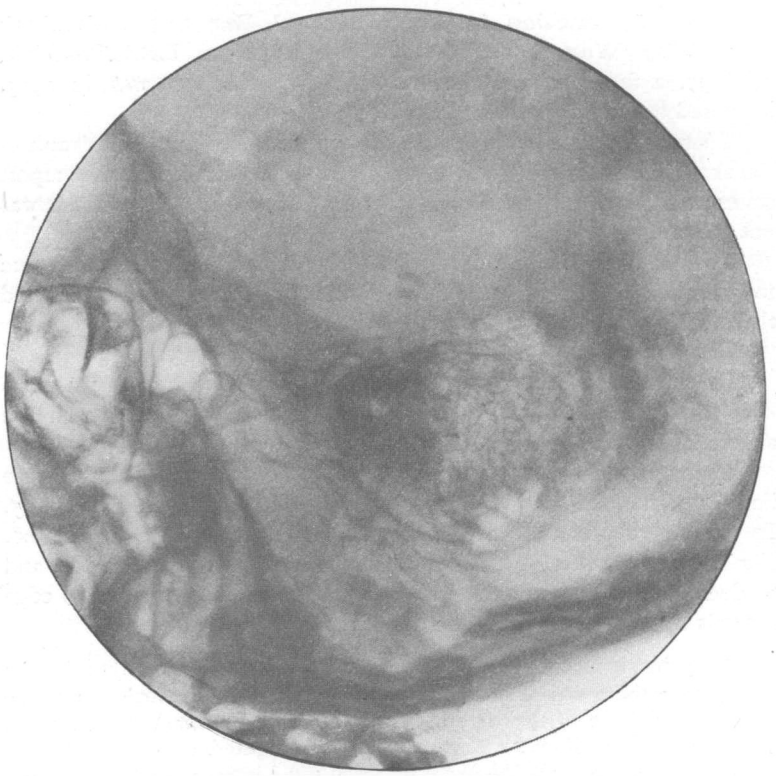
Mr SYDNEY SCOTT said he thought from the evidence, that in the second case there was destruction of the functions of the cochlea and the vestibular division of the eighth nerve, and that it came into the same category as some which the President had investigated, showing that there had occurred a rupture of the nerve fibrils into the internal auditory meatus, rather than, necessarily, a fracture through the labyrinth itself. He had seen cases in which the patient, some time after the injury, lurched towards the normal side, and that was perhaps the result of over-correction; that the patient, conscious of his tendency to lurch to one side, overdid his attempt at correction and so went towards the affected side. If one tired such patients, they would lurch towards the affected side, as their conscious effort was weak.

Sir JAMES DUNDAS-GRANT said that, during the War and since, he had demonstrated the lurching which had been referred to. To test the reality of the destruction of the labyrinth, he made the patient close his eyes and "mark time," and it was common to note that during this

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

"marking time," he quite unconsciously turned completely round in the direction of the damaged ear. Occasionally the subject tended to turn the wrong way, probably under the influence of the over-compensation to which Mr Sydney Scott had referred.

Different Types of Mastoid Processes in the same Individual. (Skiagrams)—H. J. BANKS-DAVIS, F.R.C.P.—Male, aged 61: Radiographs of right and left mastoid regions.



LEFT SIDE.

The malleus and the tympanic ring are distinctly visible on the radiographs, which show, with unusual clearness, different types of mastoid in the same individual.

Note by Dr G. Harrison Orton.—"With regard to the mastoid processes, there is some definite sclerosis of the cells on the right, as may be seen by comparing the prints of the two sides."

It is a pity it is not the universal procedure to have skiagrams taken before operation in every mastoid case.

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

Mr J. S. FRASER (President) said it was the custom at Edinburgh to have a skiagram taken of all mastoid cases before operation, except when the patients were so dangerously ill that they had to be operated upon at once. The difficulty was to be sure that such skiagrams were a real help as to indications for operation. If one saw a mastoid which was quite broken down, with the intracellular bridges gone, one had no doubt about it; but there was a type in which the cells were not so clear as they should be, and in such cases one did not know whether spontaneous recovery would occur or whether operation ought to be performed.



RIGHT SIDE.

Acute Mastoiditis: Lateral Sinus Thrombosis: Metastatic Corneal Ring Abscess—C. HAMBLEN THOMAS, F.R.C.S.—Female, aged 7 years, had, four weeks before admission, pain in right ear followed a week later by otorrhœa. Just previous to admission otorrhœa diminished.

Child was very ill on admission but not delirious. There was a discharge from the ear and the mastoid was obviously infected. There was no tenderness along the course of the internal jugular vein. Eyes were normal. Temperature was 101° F. and pulse corresponded.

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press

On 29th March, 1927, a right Schwartze operation was done with exposure of the posterior fossa. The lateral sinus showed some roughening of its outer surface but did not appear to be infected. The child improved a little but was still running an intermittent temperature. It was very doubtful whether the child had two attacks of shivering. There were never any signs in the chest and there was no tenderness along the course of the internal jugular vein. A pyæmic "ring" corneal abscess developed rapidly and the whole cornea was shed. (The eyes were therefore removed by Mr Gibb.)

6th April, 1927. Chiefly on account of this evidence of systemic infection the internal jugular vein was tied. The lateral sinus bled from both ends when opened but a purulent mural clot was removed from the region of the bulb. The child made an uninterrupted recovery. The case is shown on account of the rarity of the eye condition and the interesting fact that this was the only metastatic infection.

Congenital Atresia of the Meatus—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—A schoolboy, aged 14, was seen on 13th January on account of discharge from the left meatus of two months' duration, and complete deafness of that ear dating from birth. The external orifice of the meatus is about half the normal size and lowered in position. The concha is flatter and more extensive than normal; otherwise the auricle presents no abnormality. At a depth of about one centimetre from the orifice the meatus is narrowed to a pinhole. After cocainisation, a very finely pointed laminaria tent was introduced and allowed to dilate. It caused considerable pain and the amount of dilatation was extremely small. Drops containing acetate of lead and acetate of alumina were introduced on a pledget of cotton-wool three times in the day and dilatation was carried out on several occasions. The tenderness became much less. The discharge was sucked out; it was fœtid and probably contained macerated epithelium. After a few days it was possible to introduce a very fine Weber-Liel tube for about a centimetre.

The skiagrams, taken by Mr Hodgson, reveal a normal development of the internal ear; they show a bony meatus to be present but less in calibre than that of the opposite side. The ossicles are detectable and their appearance suggests an osteophytic outgrowth from the malleus. The mastoid cells are normally developed.

The tuning-fork on the vertex is heard loudest on the affected side and bone conduction is slightly increased. On rotation to the right (ten times in 20 seconds) there is vigorous nystagmus to the left, lasting for 30 seconds, suggesting activity of the left vestibular organs. On rotation to the left there is nystagmus to the right, lasting 28 seconds.

The boy is conscious of air passing to the tympanum when he blows his nose forcibly.

The question of operation has to be considered.

https://doi.org/10.1017/S0022215100032096 Published online by Cambridge University Press