slight deflection of the septum to the right in the upper part was seen. Operation had been refused by a well-known provincial surgeon and previously by the writer. She was given a course of inflation and improved, but the hearing deteriorated afterwards. On using the instrument she was only able to breathe in 3, and out 3.5, divisions on the right side, whilst she could do 5 divisions each way on the left. After a resection of the septum she was able to breathe in and out 5 divisions on the right; the hearing improved considerably, and this has been maintained. Moreover, she volunteered that she breathed much better, although previously she had noticed no obstruction.

2. Mrs. H., 27. Obstructive deafness, without definite nasal obstruction. The instrument showed inspiratory obstruction on the left side, and this was cured by removing a small portion of the middle turbinal which was slightly hypertrophied. The hearing has improved.

3. Mrs. P., 26. Obstructive deafness; was certain her nose was quite clear. Tinnitus was a prominent symptom, and the rhinomanometer showed 1 degree of inspiration only on the right side compared with 5 on the left. After resection of the septum she could inspire 5 degrees on the right. The tinnitus and deafness were much improved after a course of Eustachian inflation, and the improvement has been maintained. A long course of previous treatment had given no results at all.

The cases illustrate the use of the instrument, and, in all, operative treatment had previously been refused either by the writer or other surgeons.

The instrument could also be used in cases of subjective stenosis, where it would show the patient that true obstruction did not exist, and to prove to a patient who is unwilling to undergo an operation the necessity for it.

A CASE OF TEMPORO-SPHENOIDAL ABSCESS IN THE COURSE OF CHRONIC OTITIS MEDIA.

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The following case has been thought worthy of publication, because it is a case of considerable interest with regard to the history, and with regard to the pathological findings from repeated lumbar puncture, and also on account of the actual findings at the time of operation.

W. J., a man aged 25, was sent to the hospital at 5 a.m. on November 8th, 1912. He was said to have had vomiting, convulsions, and a raised temperature, 101° to 102°, during a few hours, and the diagnosis was cerebral complication of chronic otorrhoea.

The history was, that he had chronic discharge from the right ear of many years' duration. During the preceding two months slowness of cerebration and general mental dullness had been observed. There was also impairment of memory, and inability to perform his work in a proper and efficient manner. There was no history of rigor or visual affection.

Condition on Admission.

He lay in bed in the semiprone position, and resented questions and all interference. He could be roused to answer only at the end of a lengthened latent period. The pupils were equal, dilated, and reacted normally. Spontaneous nystagmus was not present. The fundi and discs were natural. The respiration was 22, quiet and rhythmical. The body and limbs revealed no cerebral localizing signs. The knee-jerks and deep reflexes were normal. There was a free purulent aural discharge on the right side. There was no mastoid tenderness or swelling.

Lumbar Puncture.

The skin over the third and fourth lumbar interspace was infiltrated with a 1 per cent. solution of novocain, lumbar puncture was performed, and 15 c.cm. of cerebro-spinal fluid, under normal conditions of pressure, were removed. The fluid was very markedly turbid. Microscopical examination revealed

acute leucocytosis. Polymorphonuclear leucocytes, 77 per cent.; lymphocytes, 9 per cent.; other cells, 14 per cent. A faint trace of sugar was present, and there were scanty endothelial cells. Micro-organisms were absent (culture tubes remained sterile).

First Operation.

On the same afternoon Dr. Percy Jakins performed the usual radical mastoid operation; a cholesteatomatous deposit, not extensive, was found within the antral cavity; the tegmen tympani was removed, and the overlying dura exposed. Granulations were found in connexion with the dural surface. Pulsation was absent, but there was no bulging, and there was no increase of tension. The tegmen tympani itself had been to all appearances normal. It was thought advisable to postpone further exploration, the operation was concluded in the usual manner, and the patient returned to bed.

After-History.

On the following day there was marked improvement in the general condition. Cerebration was noticeably more brisk; there was less headache, and the temperature fell to 99°. This improvement was maintained during the following day; the patient had no recollection of the operation having taken place.

A second puncture of the lumbar theca resulted in the withdrawal of 10 c.cm. of cerebro-spinal fluid under normal tension. The fluid was clear to the naked eye, and, on centrifugalization, only a very few cells were found. During the next two days there was persistent and somewhat severe headache.

On November 15th symptoms of a very definite cerebral type developed—twitching of fingers of the left hand, incontinence of urine, and extreme drowsiness, and the respiration gradually began to assume the cerebral compression type. The fundi remained natural, and there was no vomiting.

Second Operation.

A third puncture of the spinal theca evacuated 5 c.cm. of fluid, apparently under diminished pressure. The specimen was contaminated with blood through puncture of a spinal vein, but it was otherwise quite clear.

A second operation was performed by Dr. Percy Jakins. The anaesthetic was hardly necessary. The region of the previous mastoid operation was opened up; there was still no undue tension of the exposed dura above the tegmen. A free exposure of the squamous temporal was secured by means of an upward vertical extension of the post-aural incision. With the ½ in. hand trephine a circular piece of bone was removed at a distance of ½ in. above and slightly behind the external auditory meatus. The dura was immediately exposed. Its surface was found to be excessively tense, non-pulsatile, and in a state of venous engorgement. Crucial incision of the dura was followed by immediate hernia of grey matter, and then by immediate spontaneous rupture of a cerebral abscess, accompanied by an escape of gas. The compressional respiration was almost at once relieved. The depth of the abscess cavity was at least 2 in. A rubber tube was inserted and the wound left open.

Subsequent examination of the pus revealed the presence of *Streptococcus longus* and the *B. proteus vulgaris*. The patient gradually sank, and died at 3.50 a.m. the following day.

Necropsy.

The necropsy revealed an abscess cavity in the right temporo-sphenoidal lobe. It did not extend to the ventricle, which was found to be normal. There was no evidence of meningitis. There was slight discoloration of the dura overlying the tegmen tympani. There was no obvious disease of bone in the region of the tegmen attic. The pyogenic membrane was soft, but yet presented as a well-defined thickened zone or capsule. There was no other focus of suppuration in the brain.

The case presents several points of interest, namely:

1. With regard to the probable duration of the abscess, the thickness of the pyogenic membrane and the large size of the abscess itself are signs that seem to indicate a period of weeks rather than of days.
2. The cerebro-spinal fluid was upon all occasions sterile, both as regards direct and cultural examination. The very marked turbidity of the first specimen formed a most striking contrast to the appearances on a second and third puncture.
3. The significance of these variations with regard to the pathologic content and to the tension of the fluid is perhaps not obvious. It seems, however, clear that turbidity of the cerebro-spinal fluid, even though that turbidity should apparently clear up within a short interval, appearing in the course of chronic suppurative otitis media, and associated with cerebral symptoms, is a combination affording cogent evidence in favour of intracranial sepsis.
4. The absence of dural bulging and of increased dural tension in the region of the tegmen tympani may perhaps be explained by the fact that only a small area of the membrane was here exposed. It can only be said that the dura mater underlying the trephine opening was within the distance of one inch from the tympanic roof, and that here the tension was greatly increased.

5. Doubt remains as to the exact route of infection: if infection was established in the accepted way—by means of an infective stalk passing through the tympanic roof, through the dura, and then along the course of the vessels of the pia mater to their free bifurcation beyond the deep surface of the grey matter—the facts at least show how small may be the changes in these intermediate tissues for the establishment of a large abscess in the temporo-sphenoidal lobe.

I am indebted to Dr. Percy Jakins for his kindness in allowing me to write an account of this case, and also to Dr. Wyatt Wingrave, who has kindly allowed me to make use of his notes with regard to the necropsy and the pathological examination of the cerebro-spinal fluid.

TWO CASES OF OCULAR DISEASE ASSOCIATED WITH PYORRHOEA ALVEOLARIS.

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In view of the increasing attention now being given to oral sepsis in the treatment of systemic diseases, the following reports of eye conditions associated with pyorrhoea alveolaris may be of interest:

CASE I.

W. D., aged 23, sought advice complaining that "his sight was becoming bad." He added that he had not been in good health for the past two months, and could not see so well as formerly with his left eye. There was no history of syphilis.

State on Examination.—His vision was found to be:

Right eye = $\frac{5}{6}$; with $\begin{matrix} + 0.5 \text{ D. spher.} \\ - 1 \text{ D. cyl. } 180^\circ \end{matrix} = \frac{5}{6}$.

Left eye = $\frac{5}{6}$; with $\begin{matrix} + 1.75 \text{ D. spher.} \\ + 0.5 \text{ D. cyl. } 45^\circ \end{matrix} = \frac{5}{6}$.

There was nothing abnormal to be seen externally, but on examining the right fundus the vitreous was found to be slightly hazy. The vitreous of the left eye, however, contained some opacities, and there was evidence of recent choroiditis. The mouth was in a bad state: the gums very unhealthy, while the teeth were carious and broken-down.

Treatment and Result.—The patient was advised to have the mouth attended to at once; he was ordered atropine and rest for the eye, and was given mercury and potassium iodide internally. Two months later the vitreous opacities had cleared up, and the choroidal trouble was better. With the correction already stated, which he was now allowed to wear, his vision was: Right eye = $\frac{5}{6}$; left eye = $\frac{5}{6}$, not improved. The patient admitted that he felt better for his dental treatment.

CASE II.

Mrs. G., aged 46, was sent for treatment with an irido-cyclitis in her right eye. She stated that it had become inflamed and irritable six weeks before seeking advice.

State on Examination.—Her left eye had previously been operated upon for cataract, but she had a secondary cataract which required needling. Her vision was: Right eye = $\frac{5}{6}$, not improved; left eye = perception of light, with a fair sense of projection. She had photophobia, well marked ciliary injection, a slight degree of keratitis punctata; in the anterior chamber lay a mass of lymph, while the iris was discoloured and showed some adhesions on dilating. In the fundus was a commencing choroiditis, while there were also some vitreous opacities. The mouth showed both gums and teeth to be in a most unhealthy state. Pus oozed up from the sockets of the teeth, which were practically all carious. In addition the general state of the patient was bad; she was thin, anaemic, and generally out of sorts.

Treatment and Result.—As the patient had only the one eye to depend upon, treatment was somewhat urgent. Accordingly, she had every tooth cleared, upper and lower, and was put upon a mouth wash. Internally, she was given mist. alba with mercury and potassium iodide. She was ordered complete rest and a nourishing liquid, later semi-liquid, diet was given. A fortnight later she said she "felt better than she had done for months." The eye was much quieter, and the iritic adhesions, with the exception of one, had all broken down under the atropin. The ciliary injection had nearly disappeared, while the effusion of lymph had shrunk in size. Two months later the patient's eye was perfectly quiet, and she then discontinued her shade and the treatment. Her vision then was:

Right eye = $\frac{5}{6}$; with $+ 0.5 \text{ D. spher.} = \frac{5}{6}$ (compared with $\frac{5}{6}$ initially).

In addition she had gained 6 lb. in weight, looked better, and said she felt better in health than she had been for some time.

D

The Milroy Lectures

ON

THE HYGIENIC ASPECT OF THE COAL-MINING INDUSTRY IN THE UNITED KINGDOM.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

By FRANK SHUFFLEBOTHAM, M.A.,

M.D. CANTAB., J.P.,

MEDICAL REFEREE UNDER THE WORKMEN'S COMPENSATION ACT FOR THE NORTH STAFFORDSHIRE DISTRICT.

LECTURE V.

BEAT HAND, KNEE, ELBOW AND BUTTOCK.

THESE terms were not known in some parts of the country, even in mining districts, until they were defined by the Departmental Committee on Industrial Diseases, which reported in 1907.

Beat Hand.

The term "beat hand" signifies an acute inflammation of the subcutaneous tissue of the hand involving its palmar aspect; it may affect the palmar side of the fingers and thumb.

As a rule, the hands of a miner show rough and thickened skin on the palmar side, undoubtedly due to the use of the pick. This condition is almost invariably found in miners past middle age. The areas of skin most often affected are: (1) Along the roots of the fingers; (2) over the ball of the thumb; and (3) over the hypothenar eminence on the inner side of the hand. The skin over the centre of the hand is generally softer than the skin over other parts of the hand, and consequently this part of the hand is less protected, and this is generally the seat of the trouble known as beat hand.

Although in cases of beat hand there is no history of any injury, inoculation probably takes place through an abrasion. In the ordinary course of a miner's work the hands are often knocked and the skin abraded. These injuries may be so trifling as to escape notice, and yet they may be sufficient to permit inoculation with an infective poison. One of the most prominent symptoms, as in other septic conditions, is local throbbing, or, as it is locally known in the North of England, "beating," hence the term "beat hand," and the same explanation applies to beat elbow, beat knee, and beat buttock.

In many cases inflammation goes on to suppuration, and the pus will track along the tendon sheaths, but most often to the back of the hand. The inflammation will be limited by the thickened skin over the palm, but there may be considerable swelling in the centre of the hand, and the skin will be hot and glazed.

The course of the disease will depend upon the treatment which the patient receives. If there be any considerable formation of pus and relief is not given, a general septic condition of the hand and fingers may result, but if early treatment be applied the inflammation clears up in a comparatively short time.

The frequency of the disease among miners may be judged from the statistics compiled by the Home Office of compensation and proceedings under the Workmen's Compensation Act. On the average, between 700 and 800 cases are reported each year in the colliery districts of this country. Beat hand is most frequently found in those districts where the coal seams are hard, and the majority of cases appear to be reported from Northumberland and Durham. The men who are actually coal-getters are most commonly affected, and this can be explained from the fact that it is they who use the pick at their work.

The disease attacks the soft part of the hand, and, speaking generally, soft hands are a predisposing cause of this disease; after a long strike, during which the skin over the hand has become softened, an unusual number of cases may arise when work is resumed.

The most important etiological point with regard to beat hand is the fact that there is no history of an accident in any case, and some colliery doctors call it idiopathic cellulitis of the hand.

The duration of the disease is, on the average, from three to six weeks; the statistics of the Northumberland