Pathogenicity.

Our strains are very virulent to all laboratory animals—monkeys, rats, mice, guinea-pigs, rabbits. Monkeys inoculated subcutaneously die within twenty hours, and guinea-pigs within thirty-six to sixty hours. It is interesting to note that the strains isolated from the first three cases, even when inoculated subcutaneously in very small doses, have given rise, so far, to a general septicaemia, and no buboes are found at the *post-mortem* examination of the inoculated animals.

Plague in Ceylon Rats.

A feature of the outbreak of plague in Colombo has been that the human epidemic has not been preceded by an epizootic among rats. Natives of every class, as well as municipal inspectors, deny that there has been any severe mortality among rats in January or previous months; in fact, it was with difficulty that any dead rat could be procured during that time. The first dead rats presenting bipolar-staining bacilli were two examined by one of us on February 5th. From one of these rats the true *B. pestis* was grown; the other presented several contaminations, and the *B. pestis* could not be isolated. During the last few days several rats have been found infected by us and by the municipal bacteriologist.

We would call attention to the fact that rats found naturally infected have so far shown none of the *post-mortem* signs described by so many authors, the principal of which are buboes, the mottled appearance of the liver, and pleural effusion. Nothing is shown by the *post-mortem* examination of our rats so far, except slight hyperaemia of all the organs and slight enlargement of the spleen without necrotic patches. The blood taken from the heart, however, shows the plague bacillus in large numbers.

CONCLUSIONS.

1. For the first time in the history of Ceylon plague has broken out in the island, shattering the old general belief held by the public that this disease would never appear in the country.
2. The type of the disease has been septicaemic in all cases observed by us except in two recent ones in which axillary buboes were present. They all died within twenty-four to forty-eight hours from the onset. No cases of the pneumonic type have so far been observed.
3. The disease has probably been imported from some Southern Indian port, but we have been unable to trace it with certainty, and it is noteworthy that no steamers or boats with suspected cases have arrived in Colombo for more than a year. Another hypothesis is that there may be an unrecognized focus of plague in Ceylon.
4. An interesting feature of the outbreak has been the absence—to all appearances at least—of a discovered epizootic among the rats preceding the human epidemic. This suggests that infection took place first among men, and that rats have become infected later.
5. The infected rats so far examined have not shown any buboes, though the heart blood was teeming with plague bacilli. The plague among rats therefore appears to have been of the same type as that among men. It is probable that as soon as the Ceylon strain loses some of its virulence the bubonic type will appear both in rats and man. In man, as stated, we have already found two cases of the latter type.

THE fifth Congress of French-speaking Doctors on Physiotherapy will be held in Paris on April 14th and two following days. The questions proposed for discussion are: Myopathies; ptoses; the part played by various physical agents, particularly movement, in psychasthenias. Dr. Bourguignon, assistant director of the electro-therapeutic laboratory at the Salpêtrière, will deliver an address on modern conceptions of the pathology and electrophysiology of myopathies. Other questions to be debated are physical agents (diet, electro-therapy, hydrology, hydro-therapy and thermo-therapy, kinesi-therapy, radiographic diagnosis, radio-therapy and radium therapy) in the treatment of gout; physical agents (electro-therapy, hydrology, hydro-therapy, kinesi-therapy, radiographic diagnosis and radio-therapy, thermo-therapy, and light treatment) in ankyloses; physical agents (electro-therapy, Finsen treatment, kinesi-therapy, radio-therapy) in lupus vulgaris.

AN INSTRUMENT FOR THE DETECTION OF SLIGHT DEGREES OF NASAL OBSTRUCTION.

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THE relationship between nasal obstruction and chronic deafness due to Eustachian obstruction and chronic adhesive catarrh of the middle ear are well recognized, but it is difficult to say what degree of obstruction is necessary to produce the changes in the ear. In well-marked cases no difficulty is found in determining the presence of an obstruction. As a rule, the patient will volunteer which side of the nose is stopped up, and it simply requires inspection of the nasal cavities to discover the cause. In other cases the patients deny that there is any obstruction in the nose at all, and on examination very little evidence can be seen or demonstrated by the usual instruments, for it must be remembered that many noses, which are functionally perfect, present deviations, crests, etc., on examination, and it is a question whether such play a part in the causation of the deafness.

That slight degree of obstruction can cause serious changes in the ear can be demonstrated by the results of nasal treatment in these cases. Moreover, patients who have never complained of, and, in fact, were unaware of, the presence of obstruction in the nose have expressed the relief nasal treatment has afforded. The explanation is, of course, that they have never known what it was to breathe properly before. From the surgeon's point of view there has been some difficulty in determining in such cases whether surgical interference was justifiable. It is true that instruments have been invented, but they have either been cumbersome or awkward to use, or have only demonstrated expiratory obstruction, and, as inspiratory obstruction is probably the more important factor, they have not been of much use.

To overcome these difficulties the author has designed the rhinomanometer. The objects kept in view were that the instrument should demonstrate both inspiratory and expiratory obstruction, should be easy to use both by the patient and surgeon, should not involve waste of time, and should not be expensive. It consists of a straight glass tube of narrow bore, the distal end of which is finely constricted. To the proximal end is attached a rubber tube ending in a broad nose-piece. The glass tube is about nine inches long, and is graduated into arbitrary divisions. A cylindrical glass vessel is required in which water is placed. The tube is immersed until the water in it rises to a mark on the tube, and the water in the tube and outside are brought to the same level.

The nose-piece is pressed close to one nostril; the other is closed by the thumb pressed upwards from below—not by pressing the ala against the septum. The patient then with his mouth wide open sees how much water he can breathe in and out of the tube in five seconds, breathing as hard as he can. The same procedure is followed with the other nostril. The results give a comparison of the two nostrils with each other, and with an average person.

The average individual can breathe in and out of the instrument five divisions, but from four to six are within the normal range. Anything below four indicates definite obstruction. The results do not indicate any scientific measurement, but determine the presence of obstruction in a quick and easy way. Seeing that the nose-piece must alter the shape of the vestibule to a certain extent, it must be determined beforehand by inspection whether obstruction is present here. For example, collapsed alae or a dislocated columnar cartilage might be the cause of the obstruction. If the instrument gives a normal reading, then the whole obstruction is due to the anterior condition, but if otherwise there must be some posterior obstruction as well. As far as I have been able to determine, an obstruction showing lack of inspiratory power of more than 3 degrees is not curable by simple measures, but demands operative treatment.

The usefulness of the instrument is shown by the following examples:

1. Mrs. P., 36, had obstructive deafness of both ears. She had never felt any nasal obstruction. On examining the nose a

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 $\frac{1}{2}$ in. hand trephine a circular piece of bone was removed at a distance of $\frac{3}{4}$ 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.