bilateral destruction of the lower extremity of the temporal lobe, did not refuse to eat substances the smell and taste of which are in the highest degree objectionable to normal animals, and I do not think it is possible to explain this otherwise than on the hypothesis that the centres of olfactory and gustatory perception were, if not completely, at least extensively disorganised. It would have been well to have carried out further observations on this point, but—owing to the rather excessive mortality among my monkeys occurring at the time of the influenza epidemic—I have not been able as yet to extend my researches in this direction.

An interesting accidental experiment on a dog has been recorded by Munk which is of importance in reference to the question before us. Munk observed that a dog which he had rendered blind by bilateral destruction of its visual centres seemed unable to discover by the sense of smell pieces of meat which were scattered before it. A slight sniffing which it occasionally made was the only indication that it might possess some traces of olfactory sensibility. The animal continued in this condition for several months, at the end of which time it was killed. It was found after death that the whole of the hippocampal gyrus on each side was converted into a thin walled transparent cyst, full of fluid. Except for the cicatrices caused by the removal of the occipital lobes, the brain was otherwise normal, as well as the olfactory tracts and bulbs. Though Munk is of opinion that this case shows that the hippocampal gyrus is the centre of smell, yet inasmuch as the hippocampal lobules were implicated as well as the rest of the hippocampal gyri, we may regard it as merely a confirmation of the facts which indicate that the sense of smell is localised more particularly in the hippocampal lobule.

Luciani,²⁰ as the result of his experiments on dogs, concludes that: "No evident deficiency of smell follows extirpation of the temporal lobe; but if the lesion extend to the neighbouring convolution above the fissure of Sylvius, one observes a notable diminution of that sense. Finally, a number of experiments show that an extensive decortication of the gyrus hippocampi, as well as partial ablation of the cornu ammonis, produces olfactory disorders, at first an almost complete loss of smell—a fact which seems to indicate to us that this portion of the brain is the central point of the olfactory sphere."

Luciani is also of opinion that each centre is in relation with both nostrils, but more particularly with the nostril on the same side. In the diagram, however, which he gives of the limits of the olfactory sphere, he extends it upwards into the parietal region as far as the longitudinal fissure, and partly, also, towards the frontal lobe. In regard to the sense of taste, he states that on one occasion, in a dog, he found that, after unilateral extirpation of the fourth external convolution, and of a portion of the gyrus hippocampi, the animal seemed to be less sensitive to bitters (digitaline) on the opposite side of the tongue. (This is misstated in *Brain*. A reference to the original experiment²¹ shows that the lesion was in the left hemisphere; smell was lost in the left nostril, and taste on the right side of the tongue.)

Clinical and pathological evidence in favour of the localisation of the senses of smell and taste is as yet comparatively scanty. We have seen that, from anatomical considerations at least, the olfactory centre is in direct relationship with the nostril, but I have already mentioned that the symptoms of hysterical hemianæsthesia would appear to indicate that the olfactory, like the other centres of special sense, are in relation with the opposite side. It is questionable whether the coincident general anæsthesia of the nostril met with in this condition altogether explains the anosmia; for I have found that smell is not abolished when the general sensibility of the nostril is lost in consequence of disease of the fifth nerve. It is, however, difficult, with our present knowledge, to trace an anatomical connection between the nostril and the opposite side of the brain. The matter is, therefore, one which requires further investigation. There are clinical cases which plead in favour of the direct relationship of the olfactory centres. It may be objected against those reported by Ogle, Fletcher and Ransome,²² in which anosmia was found associated with aphasia and right hemiplegia, that there may have been direct implication of the olfactory tract or bulb. But a case has been reported by Churton and Griffith,²³ in which smell was impaired on the same side as the lesion, namely, a tumour which

caused erosion of the uncinate convolution, and which did not appear to have, directly at least, affected the olfactory tract.

Several cases have been recorded of olfactory auræ or crude sensations of smell, in association with lesions implicating the region of the uncinate gyrus. One has been reported by McLane Hamilton,²⁴ without any implication of the olfactory nerves. Another has been recorded by Worcester,²⁵ and a third by Hughlings Jackson and Beever,²⁶ in which the whole of the anterior end of the right temporo-sphenoidal lobe was the seat of a tumour involving the nucleus amygdalæ and the medullary fibres. Smell, however, was not lost in this case, either on the one side or on the other, which can be accounted for by the fact that the whole of the centre was not destroyed by the tumour.

This case as well as the others noted are, as Dr. Jackson remarks, of considerable value in determining sensory localisation, though naturally they do not afford such precise indications as to the position and limits of the centre as are afforded by destructive lesions causing entire abolition or considerable impairment. So far as they go, however, they harmonise with the results both of anatomical and physiological investigation. The smacking of the lips and tasting movements which are sometimes observed along with crude sensations of smell—"the dreamy states" of epileptic attacks—are probably discharges of the gustatory centres; but we have still fewer pathological facts bearing upon this point than on the situation of the olfactory centres. A case has been related by Dr. James Anderson²⁷ of a peculiar smell and taste sensation and dreamy state associated with tumour affecting the left temporo-sphenoidal lobe; but the lesion was too extensive and too indefinite to allow of any precise conclusions being founded on it as to the position of the gustatory centre.

THREE CASES OF ANTHRAX TREATED SUCCESSFULLY BY THE HYPODERMIC INJECTION OF MERCURIC PERCHLORIDE.

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DURING the summer of last year there were rumours of the occurrence of several cases of malignant pustule at a small village in the neighbourhood of Teheran, and several deaths were stated to have taken place among those affected; there was also a great mortality among the sheep of the district, said to be from the same cause. One day an old man was brought to me from the village in question, with undoubted anthrax of nine days' duration, on the lower lip, which was swollen, hard, of a deep red colour, and with a small crack, the edges of which were blackened, from which a thick sticky serum oozed sluggishly. He was in an extremely exhausted condition, with short, laboured respiration, varying from 50 to 60 per minute; the face was puffy and discoloured, pulse 140, and temperature 104°. The cedematous swelling was so extensive, and the patient's condition so critical, that I hesitated to excise the pustule, and contented myself with applying lint steeped in a solution (1 to 1,000) of mercuric perchloride to the sore, and at the same time injected, at four different points, two drachms of the same solution into the swollen and brawny tissue, which extended to below the clavicle and the point of the shoulder. The old man was so much exhausted that I kept him on the Legation premises till the following day, when to my great surprise I found the respirations almost normal, pulse 110, and the temperature 100°. I repeated the injection to the extent of one drachm of the solution, and the man returned home on an ass. After two days he returned, having walked in from the village, some five miles, much improved in every respect. The swelling was now limited to about an inch round the pustule, the edges of which had lost their black discoloration. I repeated the injection of one drachm. No further applications were necessary, and after ten days the cure was complete.

The man confirmed the story of the outbreak in the village, and stated that there had been six or seven deaths.

²⁰ "Sensorial Localisations in the Cortex Cerebri," *Brain*, 1885.

²¹ Die Functions-Localisation auf der Grosshirnrinde, p. 117.

²² See *Functions of the Brain*, 2nd Edition, p. 321.

²³ *JOURNAL*, May 28th, 1887.

²⁴ *New York Med. Journ.*, vol. xxxiv.

²⁵ *Amer. Journ. of Insanity*, July, 1887.

²⁶ *Brain*, October, 1889.

²⁷ *Brain*, vol. ix, 1887, p. 385.

A few days subsequently, another man, aged about 35, came from the same village with a similar pustule on the forearm, about 3 inches above the wrist. He was a butcher, and thought that he had probably inoculated the arm from a sheep. He had first noticed the swelling five days before. He had also a heightened temperature, quickened respirations, and to some extent the same bloated, puffy appearance of the face. The local swelling extended to above the elbow and down to the hand. The pustule was discharging, sparingly, a thick yellow serum from a small opening, the edges of which were blackened. Encouraged by the former case, I adopted the same treatment, repeating the injections three times at intervals of two days, and afterwards merely applying lint steeped in the solution to the open sore, which was completely and satisfactorily healed after a fortnight's treatment.

A third case was that of a boy from the same village, with a pustule on the lip of four days' duration. The constitutional disturbance, though marked, was much less than in the two previous cases, and he was cured in a week with two injections of one drachm. In each instance an ordinary hypodermic syringe with a steel needle was used, and it apparently did not affect the value of the mercuric salt.

A few weeks ago, I may mention, I treated a very extensive and angry carbuncle situated on the back of the neck of a gentleman, the *Chargé d'affaires* of a European mission here, by similar hypodermic injections of the perchloride solution, with the happiest results. The most marked feature in the case was the rapid diminution of the pain and the surrounding swelling, both of which were excessive, after the first injection.

CASE OF MULTIPLE CALCULI REMOVED FROM THE URETHRA AND BLADDER OF A MAN.

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ASSISTED BY LALLA MEHR CHAND,

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THE patient, Kamal Din, aged 20, a Mahomedan male, presented himself at the out-patient department of the Civil Hospital, Amritsar, on January 30th, in great suffering. He stated that he had passed several small pieces of stone by the urethra, and had suffered from symptoms of stone for the last seven years.

On examination, it was found that he had phimosis, and that there were several perineal fistulae, through which decomposed

urine oozed; only drops could be passed *per urethram*. He was the subject of congenital spinal curvature and talipes equinus, and altogether was a miserable specimen of humanity. His life was a complete burden to him, and he was anxious to submit to any operative procedure to get relief. The sound detected a calculus in the glans penis portion of the urethra which prevented its further passage. An enema was given, and he was at once operated on.

After an anæsthetic had been administered, the prepuce was slit up on a director, exposing the glans, and the meatus was divided for a short distance to allow of the piece of calculus being more easily extracted. The piece of stone was now seized with a pair of urethral forceps, and with a little difficulty removed; two other pieces were afterwards found lodged at the same site and removed. The sound was now introduced, and came in contact with other fragments towards the membranous portion of the urethra; the forceps were again brought into requisition, and nine other pieces of stone were picked up and extracted with considerable difficulty from that locality. The pieces being very sharp-edged, angular, and faceted, and a few of them of considerable size, they inflicted some injury on the urethra in their withdrawal, and some hæmorrhage took place. The largest piece thus removed by the forceps measures half an inch in length, three-eighths of an inch in width, and a quarter of an inch in thickness; it has flat sides and sharp angles, and, completely dried, weighs 8 grains.

When the urethra had been thus cleared, the sound was passed into the bladder, and revealed this organ filled with small stones, giving the sensation that a partially-crushed calculus does to the lithotrite. It was now decided to remove these by lateral lithotomy, as litholapaxy was considered inadvisable, owing to the sacculated nature of the urethra and the injury it had already sustained, which required complete rest, and also the extreme irritability of the bladder, which was firmly contracted on the contained mass of calculi.

Lateral lithotomy was now performed in the usual manner, except that the incision was slightly deviated to include the two principal fistulae, and twenty-three sharp, angular, faceted calculi were removed by lithotomy forceps without difficulty. The total weight of the whole thirty-five pieces removed from the urethra and bladder amounted to 460 grains. The composition of the stones is principally phosphates. The operation took forty-five minutes.

On January 31st, the day after operation, the patient expressed himself as more comfortable than he had been for months. The temperature rose on the evening of January 31st to 103.4°, falling next morning to 99.4°; it again went up to 100° on the evening