

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. XCVII. — THURSDAY, SEPTEMBER 13, 1877. — NO. 11.

CASE OF ANOSMIA FOLLOWING A BLOW ON THE OCCIPUT.¹

BY F. I. KNIGHT, M. D.

MR. X., forty-two years of age, a tea-dealer, was referred to me by Dr. D. F. Lincoln in the latter part of January of the present year. He complained of loss of smell and perception of flavor by taste, which was an unusual hardship to him as it entirely prevented tea-tasting.

He belonged to a healthy family, was strong when a young man, and had always enjoyed good health since, except that at the age of twenty-four he had had necrosis of the left femur, for which no accident or general disease could be assigned as a cause. He had no history of syphilis. Three years ago, when on a periodical spree, he was thrown out of a buggy, and struck on the back of his head. He was unconscious for twelve hours. Blood flowed freely from the nose, and some flowed from one ear. For several days he suffered great pain in this ear. Since then he has had no pain or other cerebral symptoms, and the hearing has seemed perfect.

Two or three weeks after the accident, on recovering from a cold in the head, he first noticed complete loss of smell. His condition had been such since the accident, however, that it is very doubtful whether he would have missed the sense of smell earlier. He had not been subject to chronic nasal catarrh nor particularly liable to the acute form of this disease. On testing the sense of smell he could recognize nothing held to the nose, not even assafoetida or oil of peppermint introduced into the nostril. On testing the sense of taste he could recognize sweet, sour, salt, and bitter tastes, but nothing more, except when aided by the tactile sense, which was normal. He recognized no flavors. He could not distinguish different kinds of meat, nor recognize differences in wines except in their sweetness or pungency. I gave him a piece of raw onion, and after carefully chewing it he said it was onion, and thought he got some flavor from it, but I consider it probable that his recognition of this was due to tactile sensation. I did not think at the moment to try him with the expressed juice simply. Like other anosmic patients he had preferences in food, probably derived from

¹ Read at the meeting of the Boston Society for Medical Observation, June 18th.

memory, but he had no dislike of new dishes, and continued the habit of smoking. On examination of the nose there was found some deviation of the septum towards the right. There was perhaps increased redness of the mucous membrane of the septum and middle turbinated bones as seen anteriorly, but no marked swelling. Posterior rhinoscopy showed some swelling of the inferior turbinated bones, which, strangely enough, subsided considerably under the passage of a probe. No crusts or even secretions other than normal were visible. The patient stated that he was not troubled with any nasal discharge, but was expecting it, because he had been told that his loss of smell was due to catarrh. I examined the nose again in May, and found much the same condition, except that the mucous membrane of the septum and turbinated bones was rather more swollen, but not nearly so much so as we see every day in patients whose sense of smell is very acute.

What was the probable cause of the anosmia in this case?

The sense of smell and distinction of flavors in eating are generally admitted to be due to irritation of the olfactory nerves. These are distributed on the upper half of the septum, the superior turbinated bones, part of the middle turbinated bones, and the under surface of the cribriform plate of the ethmoid. Exactly how this irritation is accomplished is by no means settled.

The sense of smell (we include, also, now and hereafter when we use this word, the perception of flavor by taste) may be interfered with, in one who has previously enjoyed it, in many ways. In the first place it seems to be necessary that there should be not only an open passage from the object held before the nose or in the mouth to the olfactory region, but that there should be a draught through from the nose to the mouth, or *vice versa*. If we hold the nose anteriorly with the thumb and finger, we cannot recognize the flavor of anything (even of an onion) put into the mouth, although, of course, the passage from the throat to the olfactory region remains open. If the posterior nares are completely closed by the adhesion of the soft palate to the posterior wall of the pharynx, the sense of smell is lost, but is restored as soon as an opening is made in the soft palate.¹

If, by chance, in any case the sense of smell is present while the perception of flavor by taste is absent, or *vice versa*, it is probably because a draught to the olfactory region can be made in one direction and not in the other. Küss, in his *Physiology*, while the only author whom I recall who speaks decidedly on the necessity of draught, says that freedom of expiration does not suffice for taste. But I think this opinion is not strictly true. If we take a little wine, for example, into the mouth, close the nose, swallow, and then open the nose during

¹ See case of Mr. Coulson, *Lancet*, November 15, 1862, p. 529, and unpublished case operated on by Dr. Porter at the Massachusetts General Hospital.

expiration, we can recognize the bouquet of the wine quite distinctly. In the same manner we can appreciate the aroma of coffee. We undoubtedly obtain a much finer perception by opening the mouth and allowing a perfectly free circulation of air.

It is unnecessary for me to go into details of what may cause obstruction to draught, anteriorly or posteriorly, in the nose, such as catarrhal thickenings, other results of inflammatory action, polypi, etc. Dr. Ogle¹ says that anosmia on the affected side is observed in every well-marked case of facial paralysis, and accounts for it by the paralysis of the nasal muscles, which prevents, on the one hand, active dilatation of the nostrils, which is necessary for one method of smelling, and on the other, lateral compression, which is necessary for the other. In a case of facial paralysis seen recently by me I could detect no affection of the sense of smell. (The disturbance of taste proper in facial paralysis, as is well known, is referred to the communication of the facial nerve with the fifth pair by means of the chorda tympani.)

In the second place the mucous membrane and special nerve fibres of the olfactory region must be in a healthy condition. Excess of moisture or dryness is supposed to interfere very decidedly with the sense of smell. According to Longet,² section or morbid alteration of the fifth pair causes congestion and a fungous consistency of the nasal mucous membrane, which is liable to bleed at the slightest touch. Continued inhalation of irritants, as of sulphuric ether,³ may cause anosmia.

Notta⁴ reports cases in which he assumes the existence of atrophy of the olfactory nerves, and others which he calls cases of *essential* anosmia, not being able to find or conjecture any lesion.

Thirdly, the absence of pigment in the olfactory region may perhaps affect the sense of smell.⁵

Fourthly, cerebral disease may destroy the sense of smell, and blows on the head have been followed by anosmia with or without other symptoms.

In our case there does not appear to have been any obstruction to the passage of odorous particles to the olfactory region, nor does there appear any evidence of such a condition of the mucous membrane nor of terminal olfactory nerve fibres as would completely deprive the patient of the sense of smell. It does not seem at all likely that one acute attack of coryza, such as he happened to have about this time, would do it. There was no evidence of cerebral disease, but he had received a severe blow on the head, which has caused anosmia in a considerable number of recorded cases.

¹ Medico-Chirurgical Transactions, vol. liii. p. 268.

² Traité de Physiologie, Paris, 1860, vol. ii. p. 486.

³ See Virchow's Archiv, Bd. xli. p. 290. 1867.

⁴ Archives générales de Médecine, April, 1870.

⁵ See case of Hutchinson, American Journal of Medical Sciences, January, 1852, p. 146, and the very interesting physiological speculations of Dr. Ogle (l. c.) based upon it.

Sir Benjamin Brodie¹ mentions four cases of injury of the head followed by complete loss of smell. In none of them was there reason to suppose fracture of the base of the skull. In one of them the occiput is described as the seat of the injury, and in this there was no improvement in smell at the end of five or six months. In the other three the seat of injury is not stated, but one of them recovered completely at the end of a year, and in the others there was no improvement at the end of one month and many years respectively.

Dr. J. Hughlings Jackson² reports the case of a gentleman, fifty years of age, who fell from a horse, probably in consequence of a blow from a robber. A very large quantity of blood was lost from the right ear, and there were two wounds, one just above the occipital ridge, the other under the chin. "All the worst symptoms of concussion resulted." Smell and taste never returned. Fourteen years later there was loss of speech and hemiplegia on the left side.

Dr. Ogle³ reports four cases:—

CASE I. A gentleman had fallen from his horse twenty-seven years before, striking his head heavily against the ground, on the left side and in the posterior part. Anosmia had existed since the accident. He had been liable to headache, and said that "his nerves were not so strong as they had been."

CASE II. Mr. — was knocked down by a cab two years previous to the report, and fell backwards, striking his occiput heavily against the road. For a minute he was stunned, but managed to get home, where he was laid up for a time, suffering from the local injuries and from severe headache. All this passed off, and he was left with no other permanent symptom than total loss of smell.

CASE III. C. L. was admitted to the hospital in February. He had been knocked about the head in a drunken row the preceding Christmas, and ever since had suffered from strange sensations in the head, and from occasional attacks of nose-bleeding. He had been somewhat deaf since the injury to his head, and had completely lost his sense of smell. After a short stay in the hospital serious head symptoms declared themselves, and he had to be removed. He was said to have eventually become insane. The history of the symptoms immediately following the accident are not given, but the deafness and the subsequent cerebral symptoms point to possible fracture of the base at that time.

CASE IV. The fourth case of Dr. Ogle is merely mentioned, in a foot-note added after the original paper was prepared, as one of permanent anosmia following a blow on the occiput.

Notta⁴ reports the following cases:—

¹ Medico-Chirurgical Transactions, vol. xiv. p. 364 et. seq., and p. 421.

² London Hospital Reports, vol. i., p. 470.

● ³ Loc. cit.

⁴ Loc. cit.

(1.) *Traumatic Anosmia without Fracture of the Skull ; Preservation of the Taste.* — M. D., twenty-nine years of age, fell from his horse, striking upon the top of his head. He was unconscious for about an hour. He recovered after venesection. In his fall he received no wound nor excoriation. There was considerable tumefaction on the top of the head, which disappeared in six or seven days. Two or three days after the accident he noticed some little clots of dried blood in his mustache, but he had had no epistaxis, no serous nor bloody discharge from the ears. There was no disturbance of vision or hearing, no weakness in the limbs ; in short, after seven days of rest he resumed his regular duties. Some days after, he noticed the loss of smell, which before had been very acute. He could not distinguish ammonia from acetic acid, nor ether from chloroform. This sense did not return. "Taste was apparently perfect." He distinguished wines of different vintages, the flavor of dishes, such as vanilla, orange, truffles, cheeses, etc., but if he stopped the nose the appreciation of flavors was lost, and only that of sweet, sour, salt, and bitter remained. In this case it seems as if the nerve filaments accessible through the anterior nares were alone impaired, while those accessible posteriorly remained intact.

(2.) *Traumatic Anosmia without Fracture of the Skull.* — A gentleman was thrown from a carriage and struck his head violently ; was stunned, but did not lose consciousness. As he got up, a few drops of blood flowed from the nose, but he was able to walk home at once, a distance of three kilometres (nearly two miles). On the following days he had no headache nor any cerebral symptom, no serous discharge from the nose or ears, and if it had not been for numerous ecchymoses on the face, which prevented his going out, he could have resumed his ordinary duties. But he had lost the sense of smell entirely, and also that of taste as far as recognition of flavor was concerned. He continued the habit of snuff-taking, not because he perceived any odor of tobacco, but on account of the irritation and sneezing produced by it.

(3.) *Traumatic Anosmia ; Fracture of the Skull.* — A miner, thirty-five years old, was struck by a large cask upon the top of his head from a height of seven metres. The wound was considerable. He could not say whether there had been bleeding from the nose or ears. He was unconscious for twenty days, and on recovery found that he had lost the sense of hearing in the right ear and the sense of smell in both nostrils. A year after the accident he appeared well in every respect, excepting that when he tried to work, to strike with a pick, or wheel a barrow, he experienced a painful sensation in the head ; if he persisted he soon became dizzy and fell to the ground ; he was subject to buzzing in the right ear, and frequently had giddiness and cephalalgia. The

sense of smell was completely lost. Notta considered that the loss of consciousness for twenty days, the deafness, and loss of smell, taken in connection with the cerebral symptoms just mentioned, authorized him to assume the existence of fracture of the base of the skull.

(4.) *Traumatic Anosmia; Fracture of the Skull; Return of Smell and Taste at the End of Three Months.*—A man, forty years of age, received, three years before, a blow on his right ear from the butt of a musket. He lay on the ground unconscious for several hours. There was a copious flow of blood from the right ear, followed by a serous discharge which lasted several days. There was no paralysis of the limbs. Leeches were applied behind the ears for several days, and calomel was administered internally. He recovered, but smell and taste returned only at the end of three months. The hearing, which had been completely destroyed in the right ear, was also restored.

(5.) *Traumatic Anosmia; Fracture of the Skull; Return of Smell and Taste at the End of Six Months.*—A man, forty-eight years old, fell violently on his right ear. He was unconscious twenty days. At first blood, then serum, flowed from the ear. There was no paralysis of the limbs. He was bled generally and locally, and calomel was administered internally. He recovered, but smell and taste returned only at the end of six months.

(6.) *Traumatic Anosmia; Fracture of the Skull; Incomplete Restoration of Smell and Taste at the End of Four Months.*—A man, fifty-seven years of age, fell from a horse, and was unconscious fifteen hours. He was not sure whether there had been bleeding from the ears or nose, but his body and head were covered with blood, and there was facial paralysis on the right side. Treated by venesection and purgatives he recovered at the end of three weeks, but had lost the sense of smell and taste. At the end of four months this sense returned to a certain extent, but was by no means acute. The facial paralysis remained, as well as a dizzy feeling on lying down. At the end of eight months more he remained in the same condition.

Dr. Hamilton¹ reports the case of a druggist who fell backward, while conversing with a friend, striking the occiput. He was slightly stunned, but soon revived. There was pain, however, during the night, and much swelling at the back of the head. He was purged, and cups and cold were applied locally. After five or six days of suffering from pain in the occipital and frontal regions, with intolerance of light, complete recovery took place, except that the sense of smell was gone. This condition persisted at the end of eighteen months. The cause of the fall was doubtful, and it was uncertain whether the anosmia was due to the condition which caused the fall, or to the blow itself, or to

¹ Transactions of the College of Physicians of Philadelphia. American Journal of the Medical Sciences, April, 1871.

following morbid changes. The patient had been previously healthy, and was not subject to fainting, but had been overtaken mentally and physically during several previous months.

Molliere¹ reports two cases: one, a syphilitic, after a blow on the back of the head, began to suffer impairment of sight, vertigo, and complete loss of smell; in the other the forehead was the part struck, and there was a fracture of the frontal bone. The account of these cases in Canstatt is very brief, but both of the patients are said to have retained the ability to distinguish wines by their bouquet.

Dr. Legg² reports a case of diminished and perverted smell after a blow on the head. A man attempted to get out at the back of a cart in motion, and fell on his head. He pointed to the right posterior parietal region as the seat of injury. He was insensible for half an hour; blood flowed from the left ear; he noticed diminution of smell and taste only at the expiration of three months, when he resumed work. Everything he ate had the flavor of gas or paraffine. Meat was particularly disagreeable to him; fish and rice less so. In seeming contradiction, the statement is made that he did not taste bread at all. He did not smell buchu, but assafetida being held under his nose he said it was a bad smell.

Mr. W. Spencer Watson³ mentions a case of anosmia and deafness of one ear from a bicycle accident, in which the skull was struck behind the ear. The details are not given, but the patient is stated to have been completely insensible for an hour or two after the blow.

Ferrier⁴ records the case of a patient who had lost both smell and the sense of taste proper in consequence of a fall on the top of his head from a cart into the paved street. With the exception of anosmia and ageusia, all evil effects of the injury had long disappeared. Under the influence of treatment (what treatment is not stated) taste improved, so that the patient could readily distinguish between sweet and bitter, and even between the flavors of beef and mutton. Smell, however, remained absolutely annihilated, a fact which shows, Ferrier claims, that the return of taste was not due to a coincident improvement in the sense of smell.

Reviewing these cases, we find that there are twenty-two in all, including my own: that nine of these had commonly recognized symptoms of fracture of the base of the skull; one had fracture of the frontal bone; the remaining twelve had not such symptoms. We find that in four of the nine cases with symptoms of fracture of the base the blow had been on the occiput; in two on the right ear; and in one on the vertex. In six of the twelve cases with no symptoms of fracture the

¹ Lyon Médicale, 1871. Canstatt's Jahresbericht, 1871, vol. ii. p. 83.

² Lancet, November 8, 1873.

³ Diseases of the Nose and its Accessory Cavities, London, 1875, page 342.

⁴ Functions of the Brain, New York, 1876, page 190.

blow was on the occiput, the seat was not stated in four, and was the vertex in two.

It is evident that the lesion in these cases might be either of the brain itself, at the origin of the olfactories, or of the nerves themselves. The cases in which anosmia has been the only symptom have naturally excited the most speculation. Dr. Ogle thinks that in them there is only rupture of the olfactory nerves as they pass from the bulb through the holes in the ethmoid. In explanation of the frequency of the occiput as the seat of injury in these cases Dr. Ogle quotes Mr. Hilton, who points out¹ that the anterior brain rests directly upon the bones of the skull, and is not separated from them, as is the case elsewhere, by the interposition of cerebro-spinal fluid. Hilton says: "When the blow is received at the posterior part of the skull, the whole mass of the brain being driven forward by the momentum given to it by the blow upon the bones of the skull, the under surface of the anterior part of the brain rubs over the depressed and elevated surfaces which constitute the anatomical features of the internal base of the skull."

Mr. Hewett² says: "In looking into these cases it will be found that the loss of smell followed such an injury as might lead to the anterior lobes of the brain being driven against the bones and bruised. And, tightly bound down, in the greater part of their course, to the brain by the arachnoid membrane, the olfactory nerves may in this form of injury occasionally be more or less bruised or pressed upon by an extravasation of blood."

Ferrier,³ commenting on his own case, which I have quoted, says it is in the highest degree improbable that a blow on the head could cause a simultaneous injury or rupture of such widely separated nerves as the olfactory, the gustatory, and the glosso-pharyngeal, and that while he regards the cause of the symptoms to be injury by counter-stroke, he attributes them to "lesion of the lower part of the temporo-sphenoidal lobe, where the centres of taste and smell are localized in immediate relation to each other."

In this connection the association of anosmia and aphasia pointed out by Hughlings Jackson and Dr. Ogle is interesting. The lesion of aphasia is pretty generally admitted, I believe, to be near the fissure of Sylvius, to the floor of which, at least, the external root of the olfactory is traced. M. Serres⁴ gives an opinion based upon nineteen autopsies of paralytics, that lesion of the external root of the olfactory is much more likely to be found than lesion of the internal in cases of anosmia.

It seems not improbable that the lesion is different in different cases: hæmorrhage, perhaps, in the region of the bulbs in those patients who

¹ Lectures on Rest and Pain, page 25.

² Holmes's System of Surgery, vol. ii., page 171.

³ Op. cit.

⁴ Anat. Comp. du Cerveau, i. 295, Paris, 1824.

ultimately recover, and fracture of the ethmoid or rupture of the nerves in those in whom no improvement takes place. In case of unilateral anosmia, or in case some other function is involved in a patient with bilateral anosmia, as of taste proper in Dr. Ferrier's case, we may suspect a symmetrical injury of the brain itself.

Jobert de Lamballe¹ gives a case of a patient with anosmia from a bullet wound, in whom on autopsy the ethmoid was found fractured and the olfactory nerves torn.

In my patient, who, it will be remembered, had other signs of fracture, I think there was probably fracture of the ethmoid.

In regard to prognosis, we find that of the ten cases with other symptoms of fracture there was recovery in two, partial recovery in one, and no improvement in seven; of the twelve cases with no other symptoms of fracture there was complete recovery in one case only, partial recovery in one, and no improvement in ten.

For treatment, electricity might at the proper time be of service to those who are capable of recovery.

ON THE TENACITY OF LIFE OF TAPE-WORMS AND THEIR LARVAL FORMS IN MAN AND ANIMALS.²

BY PROF. EDWARD PERRONCITO.³

In order to decide the important question of the tenacity of life of tape-worms and their larval forms, I began, in 1871, a long series of experiments and observations on *cysticercus cellulosæ*,³ which were published about the same time as some similar researches of Dr. Lewis in Calcutta.

Towards the end of 1874, Pellizzari,⁴ of Florence, questioned the accuracy of my investigations published two years earlier (in 1872), and agreed with Dr. Lewis⁵ in stating that the *cysticercus* dies upon exposure to a temperature of 55° C. for five minutes.

He agreed also with Cobbold,⁶ who thought a temperature of 60° C. sufficient to kill *cysticerci*. But the indications of death he relied upon

¹ Plaies d'Armes à Feu, p. 139, Paris, 1833.

² Professor Perroncito sent me the manuscript for this article. I have made a few alterations in it to render the English expressions of the author more simple. I believe his meaning has been nowhere changed. — CHARLES S. MINOT.

³ E. Perroncito. Sulla morte del *Cysticercus cellulosæ* delle Carni del Madale, 17 Apr., 1872. Annali della R. Accademia d'Agricoltura. Volume xv., 1872.

⁴ G. Pellizzari. Quad. Journ. Med., Florence, 1874.

⁵ A Report on the Bladder Worms found in Beef and Pork, by E. R. Lewis, M. D. (being Appendix B, Sanitary Commission with the Government of India, Calcutta, 1872.) London Medical Record, November, 1874.

⁶ Cobbold. Manuale dei Parassiti intorno degli Animali domestici. Translated from the English by Dr. Counnays, Florence, 1872.