

Dr. J.B. Cowan on facial anaesthesia.

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DR. J. B. COWAN

ON

FACIAL ANÆSTHESIA.

FACIAL anæsthesia constitutes one of the most interesting affections of the nervous system, not so much from its comparative rarity, as from the important character of the morbid changes from which it arises, and the varied phenomena resulting from these changes.

It is proposed, in the following paper, to give a brief account of the symptoms and pathology of this disease, derivable from an analysis and comparison of the cases upon record. To make such an account complete, it might be proper to trace the results of recent researches into the minute anatomy of the trifacial nerve, and to discuss the various intricate points connected with it, on which the opinions of physiologists differ. But the relations which subsist between the nerve, and the different organs of the senses, and in fact, its functions in general, will be pretty fully elucidated by the details of cases of facial anæsthesia, which practically confirm to a great extent the results of physiological investigation, and show most forcibly how mutually dependent upon each other are those two great branches of medical science,—physiology and pathology.

By the term anæsthesia is meant loss of sensibility, or as it is more fully defined in the work of Romberg, it implies "a diminution or loss of the energy of a sensory nerve, from its excitability or condensing power being reduced or destroyed."* The same author points out, "That it must be distinguished, as a disease, from the state in which the sensibility has not been called into play, or is undeveloped, as well as from that in which the activity of the nerve and sensation are temporarily suspended." It must be borne in mind, that sensibility admits of varying degrees, being different in different parts of the cutaneous surface, and even at different periods of life. Anæsthesia most commonly occurs, either as an immediate antecedent of motor palsy, or coincident with it, but has been found to exist in various parts of

* Romberg on Diseases of the Nervous System. Syden. ed. vol. i. p. 192.

the body, independent of any paralytic affection. Liston records a case in which no pain was experienced during the operation of removing the metatarsal bone of the little toe. Andral observed anæsthesia of the surface in a number of round spots, the adjacent integument being quite sensitive. Ollivier narrates a case where there was a spot on the hip destitute of sensibility. Pouteau gives two where the left upper extremities were devoid of feeling. Sir Charles Bell attended a lady who had deficient sensibility, first in the hands, and in whom it was latterly completely destroyed over the whole body. Romberg minutely details a case where there was perfect anæsthesia in all the parts supplied by the peroneal and tibial nerves; and others are on record where, without any deficiency of motory power, tactile sensibility was more or less destroyed.

When anæsthesia is an accompaniment of paraplegia, the extent to which it occurs seems to depend upon the producing cause. Thus, when paralysis is the result of spinal concussion, or of severe injury of the cord, along with the loss of motion, there is loss of sensation; while in what may be regarded as chronic cases, those arising from disease or some spontaneous morbid alteration, the sensibility is generally unimpaired. It may happen too, in cases either of complete or partial paralysis, that the sensibility without being destroyed is defective, and that the anæsthesia may confine itself strictly to one seat. When there is both palsy of motion and of sensation, a state which Dr. J. R. Bennett has characterized as constituting *perfect* palsy, the latter is invariably first restored.

Facial anæsthesia, or deficient or entire loss of sensibility in the parts supplied by the fifth pair of nerves, or in some of them, is however the most important form in which insensibility occurs, and derives much additional interest from the obscurity in which the respective functions of the facial and trifacial nerves were long involved.

It may result from disease, of the cerebrum where the fifth nerve takes its origin, of the nerve within the cranium, or of the nerve after it has emerged from the cranium: and, according to the seat, Dr. Marshall Hall has shown that there is a striking contrast as far as regards one class of symptoms. Thus, where the disease is one of origin, there is insensibility of eye and nostril; when it exists in the nerve exterior to the cranium, the eye is unaffected, while, should there be disorganization or division of the nerve within the cranium, the eye is partially disorganized, owing to the destruction of its ganglionic or nutritive function. Romberg describes a peripheral and a centric anæsthesia of the fifth pair, the first distinguished by the isolated loss of conduction on the side of the lesion, while the physiological characteristic of the second lies in the crucial effect of the lesion, the diagnosis being established by coincident affections of the nerves of the

face or trunk. He shows how the precise seat of the disease may be diagnosed in the following propositions:—(a) “The more the anæsthesia is confined to single filaments of the trigeminus, the more peripheral the seat of the cause will be found to be. (b) If the loss of sensation affects a portion of the facial surface, together with the corresponding facial cavity, the disease may be assumed to involve the sensory fibres of the fifth pair, before they separate to be distributed to their respective destinations; in other words, a main division must be affected before or after its passage through the cranium. (c) When the entire sensory tract of the fifth nerve has lost its sensation, and there are at the same time derangements of the nutritive functions in the affected parts, the casserian ganglion, or the nerve in its immediate vicinity, is the seat of the disease. (d) If the anæsthesia of the fifth nerve is complicated with disturbed functions of adjoining cerebral nerves, it may be assumed that the cause is seated at the base of the brain.” The disease may be a consequence of some injury, may be spontaneous, or attributed to some exciting cause. It may be general or local, or more correctly perhaps, complete or incomplete; the first being when the whole of one side of the face, the second when only a portion, is affected, and this latter is most likely to follow an injury, or to be an accompaniment of palsy of the motor branch of the fifth. Thus, Sir C. Bell details the case of a gentleman who, after getting a tooth extracted from the lower jaw by an inexperienced person, found that he had lost the sensation of one-half of his lower lip, a circumstance which formerly would have been inexplicable, but is now understood to have arisen from injury of the mental nerve, which comes through the jaw to supply the lip. The symptoms of facial anæsthesia may develop themselves gradually, or may come on suddenly, and not unfrequently they are preceded by neuralgia. It will appear obvious from a perusal of the published cases, that what seems to be the most permanent symptom in many of them, is absent altogether or less marked in others, owing to the difference in the seat of the lesion. Further, it is by no means infrequent to find this disease of the fifth nerve complicated with disease of other nerves, more particularly of the portio dura of the seventh.

The symptoms may be generally stated to consist in complete or partial suspension of the functions of the trifacial nerve, loss of tactile sensibility in the parts supplied by it, viz. the integuments of the cheek and side of head, the eyelids, conjunctiva, tongue, schneiderian membrane, &c. accompanied by loss of taste on the side of the tongue which is affected, frequently by loss of smell and hearing, and by inflammation of the eye, terminating in ulceration of the cornea, and by no means uncommonly, in total disorganization of the globe. An interesting addition to these symptoms is paralysis followed by wasting of the muscles of mastication, supplied by the inferior maxillary nerve. Although,

however, the parts mentioned may be quite destitute of sensibility strictly speaking, it must be remembered that the feeling of pain may be conveyed from the presence of some inflammatory or other morbid process going on in the nerve, or in other words, the loss of sensibility may be merely superficial. It is by no means uncommon for the real nature of the affection to escape notice for some time, the attention of the practitioner being directed to some one prominent symptom as the ophthalmia. As the disease, whether existing in the brain or in the nerve, advances, there may be many complications.

To trace the connexion existing between the nerve and the parts supplied by it, the individual symptoms will require separate notice, and their comparative frequency and importance will be illustrated by constant reference to the cases which have been recorded. It does not appear that the disease is of more frequent occurrence at any particular period of life, but in young persons it is very uncommon in the permanent form. Partial loss of sensibility, however, may accompany what is called a *blight* or temporary paralysis of the facial muscles, an affection caused by exposure to cold, by enlargement of the parotid gland, by tumours pressing on the facial nerve, by lesions of that nerve, or by abscesses of the internal ear.

Causes and Premonitory Symptoms.—The occurrence of the disease is ascribed by the patients to a variety of causes, many of which are of course unconnected with it altogether, and there is a marked difference in the primary symptoms in different cases. Injuries have in several instances produced facial anæsthesia. Two are recorded, one by Berard,* the other by Von Meyer,† in which it supervened on pistol shots, received respectively through the right ear into the petrous bone, and on the right side of neck; and in the case of Windsor, given by Sir C. Bell, it seems to have followed the receipt of two injuries on the same part of the head. There are two or three more common modes in which it makes its onset. It is often sudden, and sometimes is only preceded by a slight perversion of sensibility, or by a tingling sensation. Frequently there are attacks of headache, or pains in occipital region and in the side of the face, which is afterwards the seat of the anæsthesia. Dimness of vision may be such a prominent symptom that the patient may not be aware of the loss of sensibility, till his attention is directed to it. In three or four cases it has occurred after a simple fit or an epileptic attack. Further, it happens as a consequent of facial paralysis, a fact which does not seem easily explicable in those instances where the motor power had been entirely recovered, before the sensory function had been destroyed.

(a) *The loss of common or tactile sensibility* is the main characteristic of the disease, and it is important to notice the extent over which there may be this loss. In a complete case of facial

* Gazette Médicale, vol. viii. p. 490.

† See Romberg, p. 256.

anæsthesia, the whole of one side of the anterior part of the head, and of the face, with the exception of a small space, (bounded by the zygoma, the course of the facial artery, and the lower margin of the jawbone,) supplied by twigs from the cervical plexus, is destitute of sensation. The ocular and palpebral conjunctivæ, the side of the tongue, and the nostril corresponding with the affected part, as well as the gums, are insensible, but the pinna of the ear is unimplicated, although receiving twigs from the anterior auricular division of the inferior maxillary, and also the back part of the head. As instances of this complete nature, the case given by Mr. H. Mayo,* and one of Mr. Dixon's,† may be cited. In the first of these, there was insensibility of the whole of left side of face and head, except the ear, the skin over the parotid, and a narrow surface extending to the upper lip in the line of the facial artery, being parts supplied by the second cervical nerve. The back and upper parts of the head, too, retained their sensibility. The left eyeball, nostril, and gums were perfectly, the left side of the tongue partially, insensible to external impressions. In the second, the prick of a pin could not be felt on left side of face, except in the parts already indicated as deriving their sensory properties from the cervical nerves; the conjunctiva, left nostril, and left side of tongue were completely deprived of sensibility.

In the majority of cases, however, the anæsthesia is more limited, and in some is confined to a very small spot. Thus, in a case of Sir C. Bell's,‡ the surface of the eye and the lining membrane of the eyelids were the seats of it, but at a later period of the history it extended to the integuments of cheek and forehead for about an inch around the eye. In the cases given by Serres,§ the right eye, eyelids, nostril, and half of the tongue, were alone the seats of the anæsthesia. In another case of Bell's,|| the right conjunctiva, right side of tongue, and right nostril, were the parts deprived of sensation.

As previously stated, the want of sensibility may exist along with very severe pain arising from inflammation, and the progress of disease in the nervous substance. The most striking instance of this occurred in Windsor, whose case has already been referred to, and in whom, coexistent with tactile insensibility, there was acute pain of the whole of left side of face and forehead. In Mr. C. W. Bell's case,¶ there was loss of sensibility in left side of face, except in the integuments surrounding the orbit, and in left nostril and left side of tongue. The patient, however, often suffered from pain in left cheek, eyeball, and forehead, but always without tenderness. There is a peculiarity too in the case given by Mr.

* Anat. and Physiolog. Commentaries, part 2, p. 12.

† Med.-Chir. Trans. vol. x. p. 378. ‡ Sir C. Bell on the Nervous System, p. 339.

§ Anatomie Comparée du Cerveau, Tome 2, p. 67.

|| Op. cit. p. 301.

¶ Sir C. Bell, op. cit. p. 348.

Stanley* well worthy of notice. The patient was subject to frequent attacks of erysipelas of the head, but a complete line of demarcation was always drawn between the left (the insensible) and the right side, the former never participating in them. Dr. Rigler, in a case under his observation, states that the patient at its outset complained especially of the difference in the complexion of the two sides of the face, the left (the affected one) being remarkably pale and flabby. This then constitutes the principal symptom of the disease, and the one from which its name is derived.

(b) *Ageusia*.—The next symptom is loss of taste, which is not invariably, though in a very large majority of cases, a concomitant of the loss of tactile sensibility on the side of the tongue, corresponding with the affected side of the face and head. The only modifications of this symptom are that, as in two cases† which have been related, the taste may be perfect at the base of the tongue and lost in its anterior portion, and that, as in one case, the sense may be perverted but not destroyed.‡ Mr. H. Mayo, in the patient under his care, paid particular attention to this point. The result was, that the sense of taste was found to be absent when the surface of the organ alone was irritated, and that sugar was not tasted on either side. Cayenne pepper placed in contact with the tongue caused after a while a feeling of heat, but the patient had no perception of its peculiar savour. A probe applied to either side produced nausea and retching, a circumstance to be anticipated, as the sensations followed by the reflex action invariably occur, on irritation of the parts supplied by the glosso-pharyngeal nerve. Romberg found the left half of the tongue entirely deprived of the power of taste. The patient could not detect the most varied articles of diet on this side, while the sense of taste was normal on the opposite side. The articulating and masticatory movements of the tongue were normal, nor was the nutrition of the left side at all impaired. Dimensions, temperature, and colour, were identical on both sides. The blood exuded as freely and copiously from small punctures on the left as on the right side. The tongue was equally moist and furred on both sides.§ There can be no doubt that the presence of this symptom in cases of division or disease of the trifacial nerve has tended to elucidate the functions of that nerve, and has proved satisfactorily that the sense of taste does not reside in one but in two nerves, the lingual branch of the fifth and the glosso-pharyngeal. The surface of the anterior portion of the tongue is supplied by the first of these, while the latter is distributed on the back of the tongue, and passing along its inferior aspect inosculates with the lingual. That the sense of taste in the anterior part is given by

* Lond. Med. Gazette, vol. i. p. 531.

† Dixon, Med.-Chirurg. Trans. vol. x. p. 378 and 389.

‡ Mr. C. W. Bell's.

§ Romberg, p. 254.

the branch of the fifth, is conclusively proved by the researches of Alcock and Reid, and still more so by its loss supervening on disease of that nerve. It has been argued, however, that this was dependent on defective nutrition of the part, a supposition proved to be erroneous, in some cases at least, by the suddenness with which it occurs, and with which it ceases. Where the whole of the tongue is alike destitute of the sensation, which is the case in chronic disease of the fifth nerve, this may afford a plausible explanation. Romberg, while stating that the question is not yet definitely settled, is inclined to favour the assumption, that the glosso-pharyngeal is the only nerve of taste. He explains the phenomena in his recorded case, which has been quoted, on the ground of a sympathetic action between the sensitive and sensual nerves, which sympathy is most vividly exhibited in the sense of taste. He strengthens his position by reference to cases. In that of Stamm, reported in the *Heidelberg Medical Annals*, there being tactile insensibility of the facial integuments, the taste continued, but was much more vivid on the opposite side. The autopsy revealed a tumour situated on the right wing of the sphenoid bone over the foramen rotundum, with which the fifth nerve at the point of its division was so incorporated that it could not be detached. In Bérard's, the taste was unaffected, the fifth nerve being found on dissection softened and congested. In those of Burrows, Noble, Vogt, and one observed by Romberg himself, the taste was perfect although the tongue was destitute of sensibility. Another argument he derives from the absence of imaginary taste in hyperæsthesia of the lingual nerve. To counterbalance these statements it only requires to be mentioned that, in at least thirty of the published cases, the sense of taste in the fore part of the tongue was destroyed. It has been clearly demonstrated on the other hand, that injury or division of the glosso-pharyngeal nerve, impairs the sense of taste on the back of the tongue, and on the mucous membrane of the fauces; and that while the sense is destroyed in the fore part, in consequence of disease of the fifth, it commonly remains perfect in the back part. The experiments of Valentin seem to indicate that the most perfect sensation resides in the glosso-pharyngeal. Still more recent researches go far to show, that the sense of bitter taste is dependent on it, animals being found, after its division, to take food and nauseous substances which they had before refused, and that sweet, sour, and salt tastes, are proper to the lingual branches of the fifth.

(c) *Masticatory movements.*—The portio minor of the fifth pair, or motor division of the inferior maxillary nerve, sends branches to the muscles of mastication, the masseter, temporal, two pterygoid, anterior belly of digastric, and mylo-hyoid, supplying them with motory power, as has been established by irritating or dividing the nerve, by these muscles being unaffected in facial paralysis, and by being paralyzed in facial anæsthesia. The buccinator,

however, in the last named disease, does not participate in the paralysis, and hence the branch it receives from the fifth must be a purely sensory one, its motor powers being derived from the facial. Loss of motory power in the above muscles is a frequent accompaniment of facial anæsthesia, and if the disease is of long standing, the muscles, from the state of inactivity into which they have been thrown, become loose and flaccid. In sixteen cases at least, there is reported imperfection of the masticatory process, generally along with distinct flaccidity of the temporal and masseter muscles. That this symptom should not be of uniform occurrence admits of easy explanation. If the pathological condition be one involving all the roots, or if it implicate the inferior maxillary after it joins the *portio minor*, then there will exist paralysis of the muscles of mastication. If it exist in the ganglion, or in some of the other branches, the muscles will not be affected. In Bishop's case* the muscles on the diseased side of the face acted perfectly, and this was explained by the necroscopic appearances, the lesser root not being at all involved in the disease. In a case of Sir C. Bell's† too, where the affection seemed to result from a local injury, the muscles were unimplicated. In Mr. Whiting's,‡ at first the patient could chew with equal facility on either side, but three months before death the masticating muscles of the anæsthetic side became incapable of acting, and the autopsy clearly showed, that the morbid state of the brain producing the symptoms had been gradually extending. In Bellingeri's case,§ where facial anæsthesia ensued on partial facial paralysis, the muscles were not concerned, probably because the disease was local. This case, the ultimate result of which is not recorded, would seem to contradict the assumption of Romberg, that where the anæsthesia is complicated with disturbed functions of adjoining cerebral nerves, the cause is seated at the base of the brain. In the case of M. Serres, mastication was not impeded, and dissection revealed a lesion of the cassarian ganglion.

The centric anæsthesia of the fifth pair is described by Romberg as accompanying recent hæmorrhage in the brain. "It affects," he says, "the third branch of the fifth pair on the side opposite to that on which the lesion is seated." In the cases he had observed, there was always paralysis of the *portio minor* of the fifth, the patient being only able to masticate with the muscles of the opposite side of the face. He seems to be the only author who has met with and detailed cases of this kind.

From these facts it is evident, that paralysis of the masticatory muscles is a valuable symptom, as diagnostic to a certain extent of the nature and seat of the morbid condition on which the anæsthesia depends.

* Lond. Med. Gazette, vol. xvi. p. 463.

† Bell, p. 352.

† Op. cit. p. 339.

§ Dissertatio Inaugur. 1818, p. 125.

TABLE OF CASES AND RESULTS.

	Authority.	Vision.	Hearing.	Smell.
1.	Bishop.	Unable to distinguish colours. Strabismus and double vision.	Perfect.	Perfect.
2.	Dixon.	Destroyed.	Impaired.	Lost.
3.	...	Do.	...	...
4.	Sir C. Bell.	Do.	...	...
5.	...	Objects distorted and double.	Tingling in ears.	...
6.	...	Dim.	...	Impaired.
7.	...	...	...	...
8.	...	Lost, but restored.	Lost, but regained.	...
9.	...	Lost.	Defective.	...
10.	...	Dim.	Lost.	...
11.	Colles.	...	...	...
12.	C. W. Bell.	Lost.	...	Perverted, latterly destroyed.
13.	Stanley.	Do.	Lost.	...
14.	Mayo.	Impaired.	Do.	Lost.
15.	Alison.	Lost.	...	...
16.	...	...	...	...
17.	Serres.	Lost.	Lost.	Lost.
18.	Halford.	...	...	...
19.	Whiting.	...	...	...
20.	Bellingeri.	Perfect.	...	Perfect.
21.	Longet.	Lost.	Lost.	Lost.
22.	Bérard.	Perfect.	Perfect.	Perfect.
23.	Gama.	Lost.	...	Do.
24.	Von Meyer.	...	...	Do.

The blanks indicate no mention of the sense.

(d) *Other senses.*—In addition to partial destruction or perversion of the sense of taste, the other senses are frequently either lost or impaired, where there is complete paralysis of the fifth nerve, and the same results have been observed to follow its division in the lower animals, so that it must exercise some influence on the organs of special sense, although the nature of this influence may form a ground of controversy. From the foregoing tabular statement the comparative frequency of these symptoms will be seen.

Out of these twenty-four cases vision was more or less affected in fifteen, hearing in nine, and smell in six.

The organs of the senses, in addition to the nerves of special sense, are supplied with branches of the fifth, so that each organ has two kinds of sensibility, special and general. It is not denied or doubted that the fifth is a medium of perception, as far as regards touch, and it has been shown that it is so also as regards taste. Magendie in addition considered it as the source of smell, sight, and hearing, and by his experiments held that he had established this fully, as far as the first of these is concerned.

Sight.—That the optic nerve is indispensable to vision is clear, while, at the same time, it is obvious that the fifth exercises a very

remarkable influence over it, and that in some animals it is its sole source, they being possessed of no optic nerve. The conclusions of Alcock, to whose article on this subject in the *Cyclopædia of Anatomy and Physiology* the reader is referred, are, "that the optic nerve is the proper medium of perception to visual impressions, and that the co-operation of the fifth nerve is not even necessary, to enable the optic nerve to fulfil its function. As the instrument of the general sensibility of the structures of the eye, however, the fifth nerve may be the channel, through which impressions not visual though perhaps excited by an agent of vision, viz. light, may be conveyed." Dr. Mackenzie, it may be stated, considers irritation of the fifth by no means an uncommon cause of *sympathetic amaurosis*.

Hearing.—The power which the fifth nerve exercises over this sense is probably dependent on defective nutrition.

Smell.—The loss or impairment of the sense of smell might naturally be looked for, in those cases of facial anæsthesia, where taste is destroyed, as there is an evident connexion between the two; although its precise nature may not be easily explained. Magendie maintained that the fifth nerve was its only source. That his views were erroneous, however, has been fully proved by the researches and observations of Bell and others. In fact, he mistook the common sensibility of the schneiderian membrane for the sensation. Nevertheless, anæsthesia of that membrane diminishes the acuteness of the perception so materially, as to have led observers to consider the sense destroyed. The case of Mr. Bishop, the first in the table, in which smell remained perfect, although the fifth nerve was destroyed, establishes its dependence on the olfactory alone. The absence of an olfactory nerve in cetaceous animals, has been cited to show that the fifth is capable of conveying the sensation; but it remains to be proved that the sense exists at all or is exercised in these animals. "It appears that there is a distinct perceptive faculty enjoyed by the nostrils, independent of the fifth, and dependent on the olfactory nerve; that we possess no positive evidence of the latter nerves being in any case the media by which this peculiar perception is recognized, but that they serve for the recognition only of impressions of contact, frequency, or irritation.*

(e) *Nutritive function of eyeball*.—The next symptom of facial anæsthesia requiring notice is defective nutrition of the eye, leading to inflammation, ulceration, and ultimately disorganization of the eyeball; and this has been shown by Dr. Marshall Hall to occur chiefly when the disease attacks the nerve, before it has made its exit from the cranium, proving that it is dependent on destruction of its ganglionic function. In a case of complete *paralysis* of the fifth, the conjunctiva is deprived of sensibility and is unaffected by chemical irritants. The cornea becomes opaque,

* *Cyclop. Anat. and Physiol.* p. 307.

inflammation of all the tunics of the eye follows, and very rapidly ulceration of the cornea and destruction of the globe ensue. Writers differ in opinion as to whether these results are distinctly traceable to lesion of the fifth nerve as a primary cause, or to a combination of secondary causes; and it has been argued by Alcock and others, that the violence inflicted in the vicinity of the organ, its exposure through the deprivation of sensibility to the action of irritating matters, and the absence of the lachrymal secretion, are the conditions which tend to its inflammation and ultimate destruction. The balance of evidence appears to incline in favour of admitting the effects to ensue directly from a lesion of the nutritive filaments. Be this as it may, the fact to be stated here is, that all the appearances mentioned above are found in cases of facial anæsthesia, and form one of its most prominent symptoms. Good examples are furnished by the cases of Dixon, Stanley, and Alison. In the first of these there was ulceration at inner canthus of left eye, and left *ala nasi*. The cornea was devoid of epithelium, dry and dull. The iris motionless and of a green tint. In the second there was inflammation of conjunctiva, opacity and ulceration of cornea, escape of the aqueous humour and disorganization of the globe; and the third likewise resulted in destruction of the ocular apparatus.

(f) *General motory power of face*.—This is sometimes affected in paralysis of the fifth. Reference has already been made to the destruction of motory power in the masticatory muscles, and it is unnecessary to allude to those cases in which, from conjunct disease of the facial nerve, there is complete paralysis of all the facial muscles. Occasionally, however, more limited destruction or impairment of *mobility* occurs. In one of Mr. Dixon's cases, in addition to the left temporal and masseter muscles, the levator palpebræ and superior rectus were paralyzed, although ultimately their action was restored. In one of Sir C. Bell's cases, supervening on a fit, the affected side of face was for a time distorted. In another the power of shutting or elevating the eyelid was lost. In Mr. Whiting's case the patient could raise the upper eyelid by voluntary power, but could not keep it elevated. In Gama's the mouth was drawn to left side, the right being the affected one, and on post mortem examination the seventh nerve was not implicated in the lesion found to exist.

The treatment of facial anæsthesia can of course only be palliative, and directed with a view to mitigate the severity of the symptoms. In some cases, decided benefit has been observed to follow the employment of local applications, such as blisters and leeches; and these, combined with cupping and the administration of purgatives, are the measures which may generally be had recourse to. Spontaneous cures are fortunately not unfrequent.

Morbid appearances.—The morbid conditions out of which facial anæsthesia springs have already been indicated. They

differ from one another as to their precise nature and seat, but are rarely or never obscure. In some instances the nervous cords are the seats of lesion, and they may be found in three states, either hardened, softened, or atrophied. In Dr. Alison's case the nerve of the left side close to the ganglion was found very dense, but beyond this it was much wasted, and at its junction with the tuber annulare nothing but the membrane seemed to remain. In the case quoted by Sir C. Bell, at page 341 of his work, the fifth nerve on affected side was soft, yellowish, and reduced almost to a jelly, and a line and a half less in diameter than its fellow. The casserian ganglion may be the seat of the pathological condition. In Serres' case it was found to be swollen, of a yellow colour, and less vascular than usual, and the nerve was changed into a gelatinous substance like the ganglion. In Gama's case the casserian ganglion was enlarged, had the appearance and consistence of bacon, and had nerve-fibres fused with it. The origin of the trifacial was softened, atrophic, and deprived of its white matter.

Tumours pressing on the nerve may disturb or destroy its functions. Dissection in Bishop's case exposed a scirrhus tumour, lying on inner surface of sphenoid bone, extending laterally to the internal auditory foramen, and resting posteriorly on the pons varolii, which was slightly ulcerated. The tumour had completely obliterated the foramina for the exit of the three branches of the fifth nerve. In the frequently quoted case of Windsor, a tumour was found on side of *sella turcica* reaching forward to, and closing the foramen lacerum, and occupying the whole of cavernous sinus. It was of a cheesy texture, mixed with fibres. The third, fourth, fifth, and sixth nerves were imbedded in the tumour. In Mr. Stanley's case dissection showed enlargement of the tuber annulare on its left side, in a direction to compress the fifth and seventh nerves against the base of the skull. On making a section of the tuber annulare, a tumour was discovered extending into left crus cerebelli.

Finally, the disease may be of a more extensive character, situated in and involving a large portion of the cerebral mass. Bérard's case, in which a pistol shot had been received into the right ear, may be cited. There was loss of substance in lower portion of middle lobe of right hemisphere, leading to a cavity containing pus and the bullet. There are many other varieties in the nature and extent of the lesions, on which it is unnecessary to dwell.

Such are the characteristics and causes of a disease which, whether viewed in relation to the phenomena existing during life, or the appearances noticed after death, must be peculiarly interesting to the medical observer. The recorded facts on which this paper is based have already done much to elucidate the functions of the cerebral nerves, and there is good ground for hope, that the advance of physiological science may soon entirely dispel any difficulties and doubts which still remain.

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