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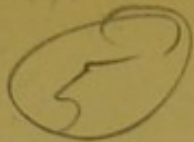
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# A FEW REMARKS ON DENTAL REFLEXES.

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F.R.C.S.I. & E.

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THE part played by the teeth in originating reflex irritations is now well established. But this source of a distant neurosis is hardly kept in view as frequently as it ought to be in the daily practice, both of the practitioner and the dental surgeon. The latter, especially, must have frequent opportunity of recognising in carious or otherwise affected teeth, an explanation of some puzzling disorder which has baffled the therapeutic skill of the physician, or the more specialised aid of the "Specialist," the attention of the latter being very naturally concentrated on that affection of nervous system, eye, ear, uterus, or other organs for which he is consulted. Since the fact has been recognised that the teeth and eyes are frequently the cause of severe headache, facial neuralgia, and more especially in the instance of errors of refraction, reflex gastric disturbances (such as nausea and sickness) dental and ocular affections, in their relation to these disorders, have had greater attention paid to them than was the practice some years since. I think that the sensitiveness of the teeth and the secondary consequences of dental disorders are more felt by women than men. This is not a matter for surprise when we remember the greater susceptibility of women to various neuroses, both visceral and peripheral, the physiological predisposition to which, the frequently recurring changes of female life bring about. No gynæcologist can any longer ignore the possibility of dental irritation being a superadded source of a headache, which he is inclined to look on as "neurotic" because he can find nothing abnormal in the pelvic viscera, or which persists after he has perchance rectified some such uterine cause of reflex disturbance as a flexion or version of the

uterus, or some irregularity in the catamenial flow. It is quite possible that the amenorrhœa, which may be associated with anæmia predisposes to the general circulatory or nervous disturbance which promotes the susceptibility to reflex irritation, started in the numerous peripheral terminations of the fifth nerve.

Cerebral or facial vaso-motor changes, due to pelvic disorders, are very common in the many ovarian and uterine affections of women. Various forms and degrees of headache accompany and aggravate such affections. Neuralgia is a frequent concurrent symptom. This neuralgia is constantly felt in the course of the fifth and facial branches. And if search be made beyond this local evidence of nervous disturbance we may find, in cardiac rhythm or systole, proof of general increase or diminution of vascular tension. Such deviation from the normal blood current, both in quality and quantity, must have an effect in starting a stimulus in nerves, already prone to irritation through chronic disease in the tissues they supply, perhaps, themselves also, chronically inflamed and vascular, or encroached on by enlargements and pressed on by morbid effusions. I have this day seen a patient with white and gold stoppings in the upper and lower left molar teeth and overcrowded incisors: she suffers from periodical tinnitus aurium of the left ear, the hearing is nearly normal, there is nothing discernible save some slight catarrhal changes in the membrana tympani, yet there is violent neuralgic pain apparently starting in the ear and radiating in the course of the facial branches. This lady has been wearing a pessary for some time for retroversion of the womb, to which she ascribes all her ills. And many times I have known neuralgia of the ear, occurring without any inflammation or other abnormal conditions of the ear, unquestionably due to a carious tooth, and the pain has been immediately relieved by its removal. Such neuralgic attacks are as I shall show accompanied occasionally by tinnitus. Such a local symptom generally points either to an interference with the equilibration of the air in the tympanum or the fluid in the labyrinth, or at least, to sufficient irritation in the auditory nerve tract from nucleus to cortex, to start this symptom. The communications of the fifth with the facial and auditory nerves through the otic and sphenopalatine ganglia; the distinct supply of the tensor tympani by the fifth nerve, and of the stapedius by the facial—the two muscles which are most important in regulating the equilibration of the fluid in the labyrinth—offer the anatomical

explanation of such a reflex aural irritation springing from a dental cause in the superior or inferior dental branches of the fifth nerve. This possible reflex disturbance of the fluid equilibrium in the labyrinth, through an irritation existing in the teeth demands additional attention in face of the fact stated by Foster that the "activity of the tensor tympani is regulated by reflex action." Nor in estimating the various reflex relationships of fifth nerve must the fact be overlooked that at its origin the sensory root of the fifth anastomoses, with all the motor nuclei of the nerves arising from the medulla with the exception of the abducens (6th) (Landois and Stirling). There are other anatomical points in regard to the connections and communications of the fifth nerve which are of interest to remember in discussing any of those reflexes which irritation of the dental branches may produce. It may be well in the first place briefly to tabulate these.

#### SOME ANATOMICAL POINTS BEARING ON DENTAL REFLEXES.

1. Nuclei of origin of Fifth.      The connection of the motor nucleus with the cortical motor centre of the opposite side, and its connection with the descending root. The anastomosis of the sensory root with all the motor nuclei of the nerves, arising from the medulla save the sixth.—(LANDOIS and STIRLING).\*
2. Distribution from fifth nerve      The supply of the dura mater from the fifth nerve through the recurrent branch from the Gasserian ganglion, superior and arachnoid maxillary, ophthalmic division of fifth; the communications between the branches of the carotid plexus of the sympathetic, going to the dura mater, with the Gasserian ganglion and Meckel's ganglion, through the vidian. Besides the facial and spinal accessory, the motor division of the inferior maxillary of fifth sends a branch to the arachnoid, while the fifth also participates in the supply of the pia mater.
3. Distribution to scalp and communica- tions of Fifth.      Supra-trochlear, infra-orbital, from ophthalmic; temporal of orbital, from superior maxillary; auriculo-temporal, from inferior maxillary. "*All the cutaneous offsets of the fifth nerve, form communications with the adjacent ramification of the seventh nerve.*"—(QUAIN.) The intercommunications between the great auricular, small and great occipital (from the second and third cervical nerves) and the posterior auricular of the facial, form a connecting link between the cutaneous branches of the second and third cervical, and the fifth nerves. This anatomical connection has an important bearing on the concurrence of cervical with dental neuralgia.

\* Landois and Stirling, "Text Book on Physiology," 1889.

Important communications of fifth with other cranial nerves.	With the Facial.	Through the Chorda tympani; temporo-facial and temporal; malar; infra-orbital; buccal; supra-maxillary.
	With the Auditory.	The upper division of the auditory nerve communicates with the geniculate ganglion or facial, and so, by means of the large and small superficial petrosal nerves, with Meckel's and the otic ganglion, respectively.
	With the glossopharyngeal.	Jacobson's "tympanic branch" with the small superficial petrosal and otic ganglion-section of the fifth nerve is followed by inflammatory changes in the tympanum of the rabbit.—(BERTHOLD and GRÜNHAGEN.) Also, in relation to <i>ocular</i> , <i>auditory</i> , and <i>nasal</i> reflex irritation, these distributions of the fifth nerve have to be remembered.
Other Distributions		
	Eye.	The origin of the long ciliary branches through the sensory root of the lenticular ganglion: the infra- and supra-trochlear branches to the eye and lachrymal apparatus, the supra-orbital cutaneous twigs to the scalp and frontal pericranium. Communications with the third, fourth, and sixth nerves through the ophthalmic of fifth.
	Ear.	The communication through the otic ganglion with the tympanic plexus. The muscular supply from the otic ganglion to the tensor tympani and the tensor palati.
	Nose.	The supply through the branches of Meckel's ganglion, and the naso-palatine nerve, to the hard palate and the middle and inferior meati, soft palate, tonsils, septum nasi, and ethmoidal cells.

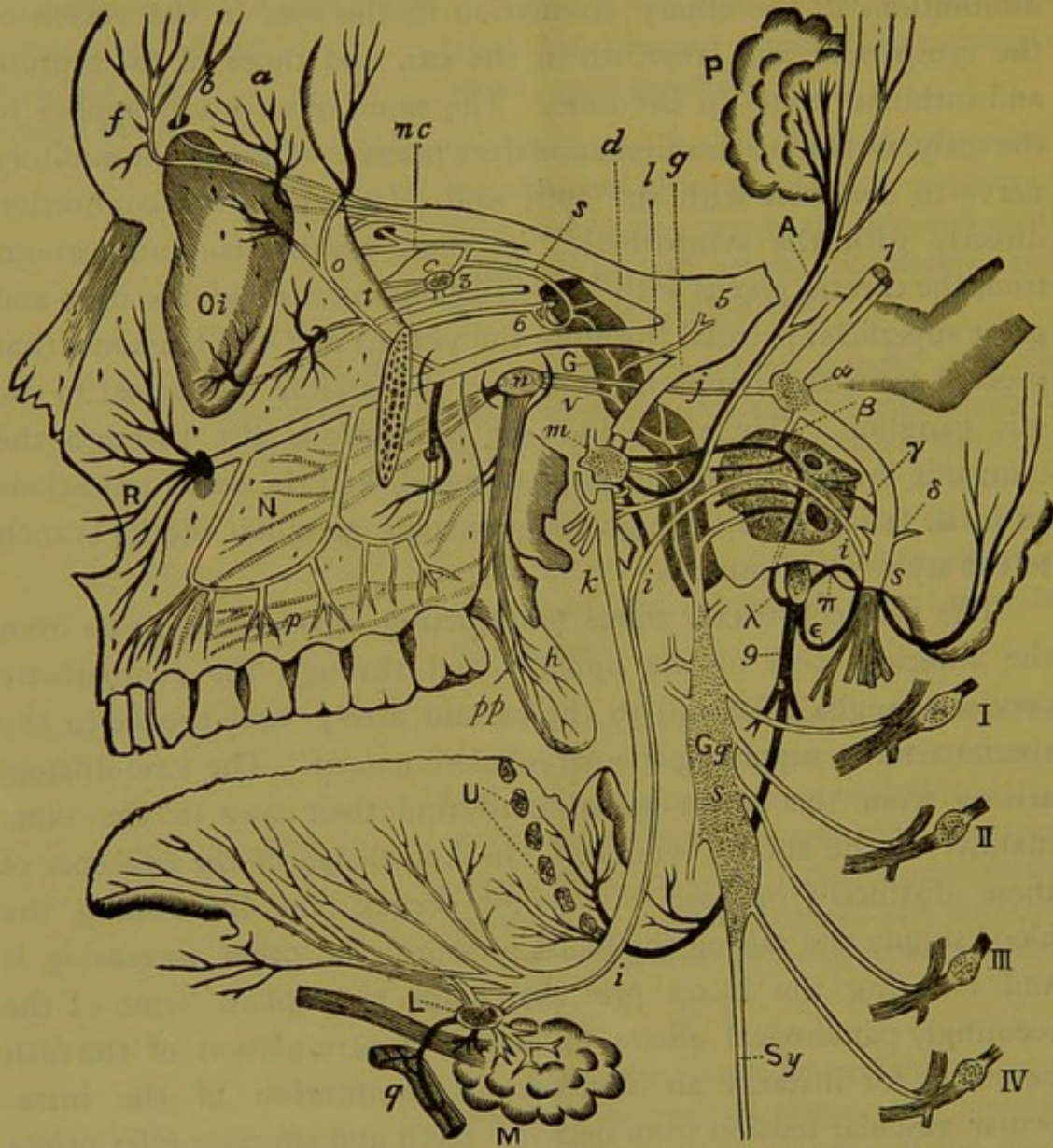
I have ventured thus to remind the readers of this paper of the connections and distribution of the branches of the fifth nerve which are in themselves sufficient to explain some of the occasional reflex symptoms that may be traced to an irritation of the dental twigs. The connections of the fifth nerve with the sympathetic are of primary importance in so far as they bear on the vaso-motor effects of irritation of the dental twigs. These effects are manifested in allied conditions of blood pressure; increase or

diminution, in the ciliary circulation in the eye, in the vessels of the tympanum and labyrinth in the ear, and those of the septum and turbinate bones in the nose. The same observation applies to the scalp, frontal pericranium, and dura mater. Though the auditory nerve in common with the optic and olfactory has no connection directly with the sympathetic, yet there are the communications from the carotid plexus with Meckel's ganglion through the deep and great superficial petrosal (forming the vidian) and the filaments that proceed from the sympathetic around the middle meningeal to the otic ganglion. There are indirect connections also through the tympanic branch of the glosso-pharyngeal, and the communications with the facial nerve through its geniculate ganglion and its branch to the stylo-hyoid muscle.

The vaso-constrictor fibres (contracting blood vessels) pass from the anterior roots of the upper dorsal through the sympathetic cervical ganglia (Gaskell) to the carotid artery, and thence to the special arteries supplying the parts before named. The vaso-dilators arising from the entire spinal cord find their way in the same manner to the smaller vessels. The knowledge of the existence of these distinctly opposed vaso-motor nerves, one diminishing the blood supply and raising the blood pressure, the other increasing it and lowering the blood pressure, helps to explain some of the seemingly paradoxical effects following on stimulation of the fifth nerve, as for instance an increase or diminution of the intra-ocular vascular tension from decayed teeth and supra-or infra-orbita nerve excitation. Still more seriously touching on this question is the knowledge that "pressor" nerve fibres exist in the trigeminus which excite the vaso-motor centre in the medulla and cause a rise\* of blood pressure. The annexed diagram (Landois and Sterling) will serve to illustrate these brief observations on the connection and distribution of the fifth nerve.

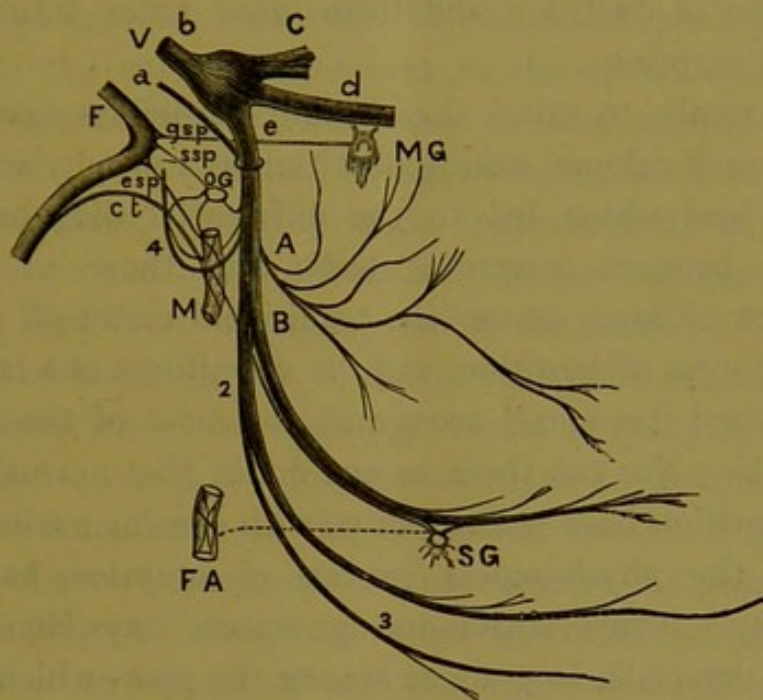
Before referring to the particular case which prompted this communication, I desire to make a few remarks gleaned from my own experience of the effects of decayed teeth on the eye and ear. The communication of Mr. Henry Pauer to the Odontological Society of Great Britain (November 5th, 1883), dealt so fully with the literature of "the relation between dental lesions and diseases of the eye" that it would be waste of space to go into the question

\* "Text Book on Physiology," by J. McKendrick, M.D., F.R.C.S., vol. ii., p. 294, 1889.



Semi-diagrammatic representation (after Landois and Stirling) of the nerves of the eyeball, the connections of the trigeminus and its ganglia, together with the facial and glosso-pharyngeal nerves. 3, Branch to the inferior oblique muscle from the oculomotorius, with the thick short root to the ciliary ganglion (*c*); *t*, ciliary nerves; long root to the ganglion from the naso-ciliary (*nc*); *s*, sympathetic root from the sympathetic plexus surrounding the internal carotid (*G*); *d*, first or ophthalmic division of the trigeminus (*5*) with the naso-ciliary (*nc*) and the terminal branches of the lachrymal (*a*) supra orbital (*b*) and frontal (*f*); *l*, second or superior maxillary division of the trigeminus (*R*) infra-orbital; (*n*), sphenopalatine (Meckel's) ganglion with its roots; (*j*), from the facial, and *v*, from the sympathetic; *N*, the nasal branches, and *pp*, the palatine branches of the ganglion; *g*, third or inferior maxillary division of the trigeminus; *k*, lingual; *i, i*, chorda tympani; *m*, otic ganglion, with the roots from the tympanic plexus, the carotid plexus, and from the 3rd branch and with its branches to the auriculo-temporal (*a*) and to the chorda (*ii*); *L*, sub-maxillary ganglion with its roots from the tympanico-lingual, and the sympathetic plexus on the external artery (*q*). 7, Facial nerve, *j*, its great superficial petrosal branch; *a*, gang, geniculatum; *β*, branch to the tympanic plexus; *γ*, branch to the stapedius; *δ*, anastomatic twig to the auricular branch of the vagus; *ii*, chorda tympani; *S*, stylo-mastoid foramen. 9, Glosso pharyngeal; *λ*, its tympanic branch; *π* and *ε*, connections with the facial; *U*, terminations of the gustatory fibres of 9 in the circumvallate papillae; *Sy*, sympathetic with *G g, s*; the superior cervical ganglion, I., II., III., IV., the four upper cervical nerves; *P*, parotid; *m*, sub-maxillary gland.

## DIAGRAM OF THE THIRD DIVISION OF THE FIFTH NERVE, ITS CONNECTION AND BRANCHES.



V—Fifth Nerve. b, large sensory root with the Gasserian ganglion; a, smaller motor root joining inferior maxillary nerve. A, anterior division of the inferior maxillary nerve with its branches to the muscles of mastication and buccal branch (mainly motor); B, posterior division; I, its lingual branch; 2, the inferior dental branch, with the twigs to the teeth, and the mental branch; 3, the mylo-hyoid branch; F, the facial nerve with its (c t), chorda tympani branch going to (S G) sub-maxillary ganglion as its motor root. O G, otic ganglion; g s p, great superficial petrosal connecting the facial nerve with (M G) Meckel's ganglion; s s p, small superficial petrosal connecting the facial nerve with the otic ganglion; e s p, external superficial petrosal connecting the middle meningeal; (M), plexus with the facial nerve. (F A), facial artery, communication with sub-maxillary ganglion.—From "Hermann's Physiology."

fully here. I regret that my Ophthalmic-Hospital notes are not now available, for I should have had a better opportunity of verifying by an analysis of cases the teaching of my hospital experience on some points of importance in regard to the relation between morbid dental conditions and certain ophthalmic affections. The various reflex affections arising during the dentition period in children are clearly recognised. Perhaps, two of the most frequently occurring are general convulsions and bronchial irritations. Many times I have seen the error fallen into of attacking with expectorants and counter irritants a lung which would have been more easily relieved by bromide of potassium and belladonna. In the face of my own experience, I am not sure, as is now generally thought, that the depletion of the gums, produced by the old practice of scarification did not occasionally relieve such reflex irritation; not, of course, with the view of facilitating the eruption of the teeth, but of

relieving the congestion of the gum. I have many times seen the immediate good effects of gingival depletion, in children suffering from the fever of dentition and from other reflex troubles arising from delayed eruption.

And this recalls to mind the old and pernicious system of the administration of calomel during dentition as a prophylactic against convulsions, and which led to the differential diagnosis by Mr. Hutchinson, between mercurial teeth and those of hereditary syphilis. Few children escape the traditional castor oil of infancy, the calomel course of dentition, and the vermifuges of a later period. "Teething" and "worms" accounted for most of the ills of the growing child. Nor can there be any doubt that normal as well as abnormal dentition have been credited with causing various troubles with which the physiological process of eruption has little or nothing to say. "Superstition and ignorance," says Henoch, "here lend a hand, especially in practice among the poor, which it is often very difficult to undo afterwards." (Lectures on Children's Diseases, New Syd. Soc., 1889). This author ascribes to rickets a much more important part in the production of convulsions in children than to dentition. "It is only rarely," he says, "that convulsions are observed in teething children who are not ricketty." It is widely known that gastric disturbances or indigestion start the nervous impulses that lead up to convulsions in young children, still my experience (a considerable one for many years) in the affections of children, has convinced me that, as a constantly occurring predisposing or collateral condition, the irritation of dentition exerts a powerful influence in causing convulsions.

I have repeatedly known the occurrence of such convulsions preceded by the recent appearance of a tooth through the gum, and the effort of a second to escape; and the cessation of such convulsive seizures, after a period of dentition has passed, proves the part played by the teeth in their causation." "Also," says Henoch, "the indisputable fact that obstinate vomiting, diarrhoea, a spasmodic cough or eczema of the face which for days or weeks has defied all treatment, will all disappear as soon as one or a couple of teeth emerge from the alveolus, and this can only be explained by the reflex action from the dental branches of the fifth on the peristalsis and the vagus or the vaso-motor nerves." Mr. Power's reference to phlyctenular inflammation\* in his paper before alluded to, is another instance of this correlation of the dentition period and a

\**Loc. cit.*

common ocular affection of infancy and childhood, a correlation with which every ophthalmic surgeon is cognisant.

A leucophlegmatic condition of the child predisposes to this response of the vaso-motor nerves to the dental irritation of the sensory dental branches. The same remark applies to spasmodic and spurious croup. Dental irritation causes periodical and alternating strabismus, occurring quite independently of convulsions. In addition to the older ophthalmic writers referred to by Mr. Power, we find Wardrop (1808) under the head of "Squint from Teething," remarking, "the squint in such cases is sometimes slight and goes away when the teething process is completed. In other instances the squint is to a greater extent, and is permanent."\*

But this knowledge of the occasional source of strabismus in prolonged or severe dentition does not absolve the practitioner from the responsibility of attending to any optical defect in the eyes of children over two years of age, and meeting such by the aid of suitable lenses or operation.

The fact that after the age of five, cases of anterior poliomyelitis (infantile paralysis) are rare (Charcot)† and that the great majority of cases occur between the ages of six months and three years makes the association of this disease with the dentition period something more than a mere coincidence (Barlow).‡ All the cases I have ever seen of infantile paralysis have occurred in children under three years of age. In none was there any direct relationship to be traced between the teeth and the acute stage or onset of the affection. In all the patients, where any cause could be ascribed, it has been that of exposure to cold, causing dilation of the vessels in that portion of the spinal cord to which this reflex excitation is transmitted. On two occasions I have known the serious mistake made of confounding this affection with acute morbus coxæ. I cannot see any difficulty in view of our knowledge of the relation and connections of the nuclei of the fifth nerve, and the researches of Gaskell proving the origin from the anterior *cornua* of the cord of the vaso-motor nerves, and the connections of these with the trigeminus, in conceiving, that an irritation of the dental nerves is capable, by reflex excitation of the sympathetic, of starting a myelitis in the anterior *cornua* of the cord, especially in the cervical

\* "The Morbid Anatomy of the Human Eye," by James Wardrop.

† Charcot "On Diseases of the Nervous System." (New Syd. Soc., 1881).

‡ Barlow "On Repressive Paralysis," 1878.

region. Henoch points out, in reviewing the symptoms of a case in which facial paralysis accompanied the paralysis of the right upper extremity, that an encephalitis of a very limited nature must have occurred in the neighbourhood of the nucleus of the left facial nerve, and he remarks that it is not quite certain that analogous changes do not occur in the brain in some cases to those found in the spinal cord. Henoch says that he has not been able to make sure of teething as the cause of the paralysis in a single case. Ross\* in commenting on the fact that dentition is the most frequently assigned cause of polio-myelitis, remarks that "it is probable that too much rather than too little importance has been attributed to this process in the production of the affection."

Dr. E. D. Mapother, in one of his papers on dermatology,† incidentally gives the details of an interesting case of reflex tonic spasm producing closure of the jaws (trismus dentium), due to impaction of a wisdom tooth in the coronoid process of the jaw, a displacement accompanied by disease of the adjacent molar. The spasm disappeared under ether, and was cured permanently, though of eighteen months' duration, by the extraction of the teeth. So far back as 1778, John Hunter, as pointed out by Dr. Mapother, noticed that the half erupted condition of these teeth had a tendency to cause approximal caries, while aphonia and amaurosis have been attributed to the same cause or the malposition of the teeth. For months Dr. Mapother's patient had been fed with fluids sucked from the point of a teaspoon. I had a somewhat similar case, in the person of a gentleman, under my care a few years since. The patient was anæsthetised with ether, but the spasm, which was associated with great rigidity of the maxillary muscles, yielded with difficulty, though I used specula and clamp to effect separation.

Mr. Sewill's case, recorded before the Odontological Society, of permanent cure of severe spasm of the orbicularis palpebrarum and neuralgia, with attendant facial hyperæsthesia, by removal of the carious incisors and some molars, is an interesting one.‡

I may here note in connection with this case, that removal of the teeth is not always attended by rapid relief of the facial spasm. In June, 1870, a lady, aged fifty, consulted me for severe spasm of the muscles of the right side of the face, attended on the least excitement

\* "Disease of the Nervous System," by James Ross, M.D., in 1883.

† "Papers on Dermatology," by E. D. Mapother, M.D., 1889.

‡ "Dental Surgery," by Henry Sewill, M.R.C.S., 1889.

by closure of the eye, and dragging of the mouth. She had had carious teeth on that side, in the upper and lower jaws. All these had been extracted before consulting me. This had cured the dental pain, but not the spasm. There was acute pain in the head, especially over the occiput; for this she had been repeatedly blistered. She had suffered, she said, from toothache, but not from neuralgia of the *face*. Under the use of galvanism, bromides, arseniate of iron, and quinine, with other tonics, she was greatly relieved, but not quite cured. In the following year the spasm recurred with severe pain in the head, which again, in a measure, yielded to remedies. She would consent to no operative interference. It may be doubtful in this case, if the neuralgia proceeded from the teeth; but it is not the only instance of a severe facial neuralgia apparently dependent upon decayed teeth which I have known to persist despite the removal of the entire offending teeth.

The shifting nature of facial neuralgia, referred at different times to various localities, and the more intermittent character of the affection, with its periodical return at certain times of the day or night, are important features of the affection which enables us to differentiate it from ordinary toothache, while more active manifestations of associated disorders of other cerebral nerves help us to differentiate mere peripheral from central disorders.

In a record of neuralgia of the fifth and facial nerves associated with tinnitus aurium, I found that out of 260 cases of tinnitus seven were suffering from neuralgia of these nerves, and seven more complained of severe headache.\* Though I have no record of the condition of the teeth in these cases, still I am aware that in many the teeth were affected, and it is only reasonable, on physiological grounds, to infer that the decayed teeth may have had a share in causing the tinnitus, or in starting the morbid condition of the tympanum which accompanied it. Rarely, however, in aural cases is *deafness* attributed to the teeth. This is my experience. Some of these cases of facial neuralgia were associated with serious eye complications. I take the following case as an instance. A single lady, aged 60, consulted me for a sightless and painful glaucomatous eyeball; the eye had been affected for eighteen months; this onset of symptoms she stated had been attended with severe neuralgia of that side of the face

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\* Opening of discussion on Tinnitus Aurium. Annual Meeting of British Medical Association. Odontological Section. 1890.

and head, accompanied by attacks of conjunctivitis ; these attacks of neuralgia persisted side by side with the progress of the affection ; I enucleated the eye. This may arise from the patient and surgeon overlooking the teeth as a probable source of the ear mischief. Neuralgic and radiating *pain* in the ear associated with dental pain is common. In the eruption of the wisdom teeth such pain is not unusual. Still, occasionally, the origin of deafness is ascribed to toothache. A lady, aged 34, consulted me in 1888 for deafness and tinnitus. She was positive the deafness at first appeared when she was suffering from severe toothache. There were carious teeth of the upper and lower jaws. She was quite healthy in every other respect. The membrana tympani of either ear was rigid ; there was collapse of the Eustachian tube—she had the teeth attended to but the deafness and tinnitus continued.

I cannot say that I regard disorders of the teeth as anything more than an occasional source, or coincidental one, of retinal trouble or glaucomatous states of the eye. I may have, from ignorance of the possible relationship, overlooked this cause of retinal irritation, increase or diminution of ocular tension, or other intraocular conditions. While I quite recognise the possibility of such dental sources of ocular mischief existing, I believe they occur but rarely. Once a lady consulted me for loss of vision in the left eye, which she asserted had commenced about six months previously, in consequence of a large maxillary abscess that had formed in the corresponding upper jaw from a decayed tooth. When I saw her the eye was typically glaucomatous. The following is a case in point.

Mr. D——, aged 47, sedentary occupation (writing), sight of right eye five months affected, began with neuralgia of the side of the face, and in the teeth ; this caused a sense of tightness in the eye, now has a black shadow before his eye occasionally,  $V = \frac{1}{3}$  of left eye,  $V = \frac{1}{2}$  right ; hypermetropic ; health otherwise good ; tension of right eye = + 3 ; right optic papilla congested, retina hyperæmic. There were several decayed teeth on each side. At this time I saw this patient only once ; the teeth I directed to be attended to. He returned after an interval of two years, improved considerably in vision but with a return of the neuralgic pains in the teeth, and complaining of tinnitus and abscess in the left meatus ; I then had some teeth extracted. The ear symptoms disappeared on treatment.

Mr. Tomes, in his classical work on dental surgery\*, in his chapter on secondary affections due to diseased teeth, quotes the case of Mr. Hutchinson's,† in which lagophthalmos and neuralgia of the left eye were ultimately cured by extraction of the five lower molars, a minute pulp exposure in one of these being sufficient to sustain the lagophthalmos after the neuralgia had been cured by the removal of the others. Temporary injection of the conjunctival vessels and even temporary ciliary congestion occasionally occur after dental operations, or are associated with toothache and dental neuralgia. After the fracture of a tooth in extraction I have seen such ocular irritation maintained for days.

Long since Donders attributed to irritation of the secretory fibres in the trigeminus, the occurrence of glaucoma, and the experiments of Hippel and Grünhagen show, that irritation, in the trigeminus nucleus in the medulla oblongata, is followed by a considerable increase of the intra-ocular pressure; the same result follows the peripheral trigeminal irritation caused by introduction of nicotine into the eye‡; such a theory, however, is only sufficient to explain the occurrence of glaucoma in a very limited number of cases, and accounts for its presence on quite different pathological grounds from those which are generally accepted by ophthalmologists, both as regards the crystalline lens and the filtrating media. The fact before referred to of the presence of "pressor" or constrictive nerve fibres existing in the trigeminus has an important bearing on this association of trigeminal irritation with glaucoma.

The case which has prompted this contribution is an example of a reflex irritation from affection of the teeth, which has hardly received that consideration which the importance and frequency of the relationship demands. Dr. Lauder Brunton, in a paper which he contributed to St. Bartholomew's Reports,|| drew special attention to those forms of headache which are dependent upon disorders of the eyes and teeth, as well as those which are due to disorders of indigestion. His attention was attracted to the relation of headache and carious teeth by his discovery of its occurrence in his own person, finding a commencing caries in the last molar tooth on the same

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\* "System of Dental Surgery," by Sir John Tomes, F.R.S., &c. 3rd edition, by Charles Sismore Tomes, M.A., F.R.S., &c. † Odontological Soc., 1885.

‡ Ross on "Diseases of the Nervous System," (*loc.-cit.*, p. 510).

|| "Disorders of Digestion," by Lauder Brunton, M.D., F.R.S., 1886.

side as the headache. "Not unfrequently," he says, "when I have pointed to a decayed molar as the origin of the headache, the patient has said, 'but I have no pain in the tooth,' and to this I usually answer, 'it is quite natural, you get the toothache in another part of your head.'" Dr. Lauder Brunton has noticed as the special seats of headache associated with teeth, the temporal and occipital regions; this location he attributes to an affection of the vaso-motor branches of the temporal and those of the occipital artery through the sympathetic system, a vascular spasm causing the pain in the head. He has noticed a tenderness in the scalp over the affected regions, and this I have myself several times verified. Dr. Lauder Brunton says that a decayed molar in the lower jaw usually causes a temporal or occipital headache, and a decayed molar in the upper jaw causes temporal headache, rather farther forward than that caused by the lower jaw. Caries of the incisors, or eye teeth, is more likely to



Dr. Lauder Brunton's Painful Regions in Dental Headache.

cause frontal or vertical headache. There is one strong clinical feature which assists in the differentiation between ocular and dental headache, viz.: the frequent occurrence of megrim in the former and its absence in the latter. I, myself, have suffered for years from severe periodical ocular megrim, of late unattended with headache, and though I have few unstopped teeth, I never have had dental headache. I believe in this, as in kindred dental associations, there generally is a constitutional state or diathesis which tends to promote the reflex irritation.

In June, 1885, I was consulted by a lady, aged 33, for severe and constant headache, mainly felt across the forehead and the summit of the head. At times this pain, as she described it, "felt like a band fastened so tightly that it would be a relief to burst it open." When it reached its climax it was felt all over the head, but always

worse at the left side, especially over the left orbit, the skin over which occasionally became red and swollen. She described a sensation "inside the head like cords cracking," she was by no means what one would term a "neurotic" subject; the headache commenced in 1882, during her pregnancy, and became more intense after her confinement; she tried various remedies, and consulted different medical men with a view of getting relief. She had change of air to different health resorts, and had exhausted the usual run of neuralgic remedies. Complaining of obstinate costiveness and pain in the back, I made an examination and found an enlarged and retroverted uterus. This I replaced, and having seen it permanently restored in its normal position, and placing her on a course of arseniate of iron with quinine, combined with the use of hydrobromic acid and bromide of zinc, she left London, and I hoped that the reflex disturbance had been due to the corrected uterine disorder. This was in June, 1885; she then assured me that her teeth had been recently overhauled, and gave her no distress whatever; there was no complaint of vision. In March, 1886, she returned as bad as ever. I then determined to have her teeth carefully inspected, which they were; some old stoppings being removed, some sensitive cavities were discovered and these were filled. There was no pain in the teeth. I also determined to carefully test the eyes for any anomaly of refraction. There was some apparent myopia (less than a dioptric in each eye, complicated with astigmatism). I atropinised the pupils, and then discovered that there was a low degree of a vertical hypermetropic astigmatism, which had produced an artificial myopia from spasm of accommodation. The astigmatism took some trouble in its correction, but was finally and completely met; the patient finding considerable relief to her eyes from use of glasses, which she still wears for near work. I now hoped that I had cured every source of reflex irritation; however, this was not so, and during the latter part of 1886, the entire of 1887, and the greater part of 1888, the patient's sufferings rather increased than diminished, notwithstanding that I exhausted every conceivable remedy, including a long trial of the galvanic current applied over the painful points, and the use of Charcot's discs, which I obtained specially for her.

In October, 1888, she came to London in despair. I thought of placing her under a Weir-Mitchell course, including head and general massage, and with this view she went into a Medical Home. While there she complained of neuralgic pain in the teeth, at both

sides of the upper jaw. Mr. Baly examined the teeth and found evidences of slight caries and periostitis in several.

Stoppings were applied in the right lower first molar, the right first and second lower bicuspid, the first left lower molar, the right upper first and second bicuspid; two painful and carious upper molar teeth were extracted. There were no wisdom teeth.

She remained in the home for some weeks subsequently to the teeth being attended to. I found no relief was given to the head. She then went for a change of air to St. Leonards, and while there had an attack of inflammation and abscess beneath the first upper molar. She immediately came to London, and contrary to my wish, insisted on having all her remaining upper teeth, all of which had stoppings, removed. Accordingly, nine teeth were extracted in November, 1888, Dr. Dudley Buxton administering the anæsthetic. Suffice it to say that from the time of the extraction of the teeth, she gradually began to improve; within three months she had lost the pain in her head, and has been for the past year, completely restored to health, passing through a perfectly normal pregnancy and successful labour in 1889.

The following report from Mr. Badcock shows what the condition of the teeth was which were extracted:—

“On examining the teeth one is at once struck by the fact that *all* are carious, and exostosed, and moreover that these conditions are distinctly proportional to one another, varying in amount from large mesial and distal cavities, with marked apical enlargement in the case of the lateral, to carious fissures and slightly thickened cementum in that of the molar.

“That the exostosis was the immediate cause of the neuralgia is pretty certain, and I am led to this conclusion by the consideration of the following facts. Firstly:—At no time while the case was under my observation were there any localised symptoms whatever.

“Secondly:—No relief followed treatment of any tooth or teeth other than extraction.

“Thirdly:—On section and microscopical examination of four of the teeth I find no evidence of intrinsic or extrinsic calcification of the pulp; but, on the contrary, the pulp cavities are normal in every respect.

“The thickening of the cementum is probably not sufficient to have given rise to symptoms had the general health been normal. That this was not so is shown by a carious condition of every tooth,

at the points corresponding to the gingival margin, where, in some cases, fittings had been inserted, but these had failed to arrest the progress of decay.

“As to the cause of the exostosis, I am inclined to attribute it partly to extension to the dental periosteum of slight pulp irritation, due to caries; and partly to the fact that the teeth have for a long time been subjected to severe irritation as evidenced by large facets; these especially were marked on the lingual aspects of the incisors and canines.”

In reference to this case, the following observations of Mr. Tomes are of importance: “There are cases, however, in which the presence of exostosis even of slight amount produces great misery. A certain tooth is pointed to by the patient as the cause; its removal brings relief, the complaint returns, another tooth is fixed upon and removed with a similar result. Another and another follow, and it is only after all the teeth in the upper or the lower jaw have been removed that the patient gains permanent immunity from pain.”\* Mr. Tomes gives some interesting cases as examples of this persistent pain until extraction of all the diseased teeth had been effected. Two cases occurred under his observation in which epilepsy appeared to be consequent upon diseased and exostosed teeth.

I regard the case as one of the greatest interest, not only to the dental practitioner, but also to the physician or surgeon; three causes were coincidentally in operation, to any of which experience proves severe reflex headache might be attributed. When I had successfully relieved two of these, and thought that I had combated the remaining one, by twice having the teeth carefully examined and treated, the hidden source of the mischief still remained until the radical cure of extraction was resorted to. The practical lesson from such a case is obvious.

In 1888, I was consulted by a patient, aged 60; he came complaining of violent neuralgia of the face and hemicrania. He had tried a variety of remedies without effect. On examining the teeth I found an old tooth plate, which had not been removed for four months, and which covered some carious stumps; there were also two highly inflamed and sensitive teeth, covered with tartar, and the gums generally were in a most unhealthy condition. I recommended, in addition to other remedies, attention to the teeth. I did not hear of the sequel of the case.

In 1885, a lady, aged 35, consulted me for persistent headache,

\* *Loc.-cit.*

attended occasionally with nausea and sickness ; in this case there was extensive erosion of the os uteri. I hoped by curing this, and other general treatment to cure the head symptoms, but I was disappointed. Fortunately, I remembered the teeth as a source of irritation, and found that there were eight carious teeth in the upper jaw, all of which she had removed ; this was followed up to the time I last heard of her, by considerable though not entire, relief from the headache.

A young lady, aged 20, consulted me last year for a neuralgia of the head and face of two years' duration ; her health in every other respect was good. On examining her teeth I found that she had not a single sound tooth in the upper jaw ; my prescription was a reference to a dentist. I have not heard of her since, but I could by referring to past cases adduce many similar proofs of the correlation between carious teeth and severe headache. This paper has, however, quite exceeded my original intention in writing it, my only object being to add my testimony to that previously offered with regard to the importance of not overlooking the teeth as a source of obscure affections the causation of which has not been ascertained. The dentist and the physician should be more commonly in touch than they have been to secure this result.

