Tic douloureux, or neuralgia facialis, and other nervous affections : their seat, nature, and cause : with cases illustrating successful methods of treatment / by R.H. Allnatt.

TIC DOULOUREUX,

OR

NEURALGIA FACIALIS,

AND

OTHER NERVOUS AFFECTIONS;

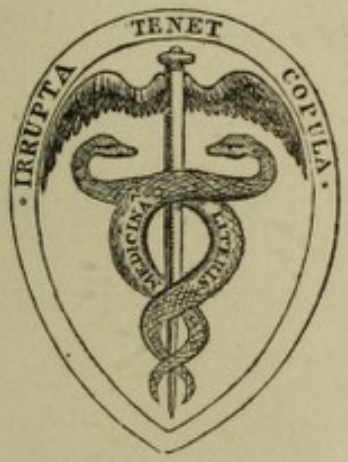
THEIR SEAT, NATURE, AND CAUSE:

WITH CASES

ILLUSTRATING SUCCESSFUL METHODS OF TREATMENT.

BY

R. H. ALLNATT, M.D. A.M.



LONDON:
JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCXLI.

C. ADLARD, PRINTER, BARTHOLOMEW CLOSE.

TO

CHARLES ATHERTON ALLNATT, Esq.

Senior Alderman, and Father of the Corporation of Wallingford,

WHO, FOR A PERIOD EXCEEDING HALF A CENTURY,

HAS DISCHARGED HIS MAGISTERIAL

AND OTHER PUBLIC DUTIES

(ACCORDING TO THE UNITED AND RECORDED TESTIMONY OF HIS FELLOW-TOWNSMEN)

WITH ZEAL, ABILITY, AND STERN INTEGRITY;

THE FOLLOWING PAGES ARE MOST AFFECTIONATELY

DEDICATED,

BY HIS SON,

THE AUTHOR.

PREFACE.

On referring to authors, no one can fail of being struck by the vast variety of conflicting testimony regarding the cause and nature of the painful malady which forms the main subject of the following treatise; and with the opposing and empirical practice which, as a natural consequence, has emanated from these adverse opinions.

The present state of our knowledge regarding the functions of the Ganglionic System is confessedly vague and unsatisfactory, but enough has of late years been accomplished by enlightened observers, to warrant the conclusion that it exerts a powerful influence on remote parts in certain pathological conditions.

Practitioners had, indeed, discovered that by the employment of certain means, acting through the constitution, disorders seated apparently at a distance from the exciting cause were often speedily removed; but, satisfied with the bare knowledge

of this practical fact, few efforts were made to discover the *modus operandi* of the therapeutical agent. To carry out the proof, therefore, and endeavour, by analogical deduction, to establish more definite views of the essential nature of neuralgia, are the objects of my present labour.

I anticipate that objections may be raised to some of the positions I have ventured to maintain; but being satisfied of the efficacy of the mode of treatment which emanates from these principles, I feel justified in giving them publicity, and in earnestly entreating my medical brethren, if not to adopt my views in their full extent, to yield, at least, a fair and impartial trial to the remedies and the general line of practice proposed.

I do not despair, with the advancement of physiology, of seeing the day when the treatment of the neuralgiæ, divested of its empiricism, will be grounded upon a broad and scientific basis. And they who, with mature and practical judgment, shall be instrumental in aiding its approach, by diminishing the sum of human misery, will be entitled to rank with the benefactors of mankind.

R. H. ALLNATT.

4, Parliament Street, Whitehall;
October, 1841.

CONTENTS.

TIC DOULOUREUX.

SECTION II.

OTHER AFFECTIONS OF THE GANGLIONIC SYSTEM.

CASES OF TIC DOULOUREUX.

TIC DOULOUREUX,

&c. &c.

SUBJECT.

NEURALGIA, in strict medical language, is the designation first applied by Chaussier to painful affections of the nerves; and, being derived from *νευρον* a nerve, and *αλγεω* to suffer pain, it is particularly appropriate.

ITS SEATS.

Neuralgia may occur in any part of the body pervaded by the gray or ganglionic nerves. In the nosological arrangement of Mason Goode, the class Neurotica is divided into three species; viz. Neuralgia Faciei, Neuralgia Pedis, and Neuralgia

Mammæ: this, however, is circumscribing the species too much.

The neuralgia mammæ has been latterly described by Sir Astley Cooper; and it has been supposed that Willis, in his work published in 1682, also described that affection.

Neuralgiæ of the skin may manifest themselves in every grade, from the most trivial degree of pain to the most extreme state of suffering.

The muscular system, in like manner, may, in a variety of ways, indicate an abnormal state of the nerves by which it is supplied. Thus there may exist slight spasm produced by a low degree of nervous susceptibility, or it may be affected by the variety of morbid states included between the two extremes of tremor and convulsion.

The internal involuntary muscles are also subject to irregularities of function produced by the same cause; but the term Neuralgia is evidently a misnomer when applied to parts which are endowed, not with conscious, but mere organic, sensibility. Thus the heart may be attacked with palpitations; the vermicular motion of the

stomach and peristaltic action of the intestines may be subject to irregularity; and the glandular organs may manifest the interruption of their natural functions by a change in the secretions. Sometimes, however, pain is even there the prominent symptom, giving rise to gastrodynia, nephralgia, &c.

The intermittent and continued pains which sometimes attack the arteries and follow their course, have by Laennec been supposed to arise from neuralgia; and, by some pathologists, it is believed that, in many instances, angina pectoris is also a species of the same affection, as well as that it frequently occurs unconnected with organic disease of the heart.

M. Piorry has lately described a curious form, which he designates "Nevralgie irienne, ou ophtalmique," where the pains commence, as he supposes, in the nerves of the iris. It attacks persons who dwell in dark apartments, those who read or write much, and artisans whose occupation requires them to fix their eyes continually on minute objects. At the commencement of the

attack, the symptoms are referred to the eye; the sight is suddenly obscured or perverted; and frequently there appears before the eye a dark spot surrounded by a luminous circle. After an interval of variable duration, generally not exceeding a few minutes, this symptom disappears, and is succeeded by stupor, vertigo, lancinating pains of the eye and temple, and a sensation of pressure over the eye, as if it were too full. About this stage of the attack, *vomiting* usually occurs, and the paroxysm begins to decline. [1]

There is in fact scarcely an end of the Protean forms assumed by neuralgia; and I have taken the preceding cursory glance at a few of them merely to show the extensive range it is capable of comprehending.—There are several others of more unfrequent occurrence, the description of which I do not here propose to dilate upon, as my object is to confine my attention more particularly to the symptoms, pathology, and treatment of the species which forms the title of this work.

[1] Treatise on Neuralgia, by Dr. Rowland, p. 100.

AMBIGUITY OF DESIGNATION.

Tic Douloureux has become the distinctive appellation of one of the most formidable affections to which the human body is subject. The derivation of the term Tic is unknown, but is ridiculously enough supposed to be a synonym of the Greek τριζω, to gnash or grind the teeth, which is intended to be expressive of the action it imports. According to Sauvages and Soleysel, it is derived from the sound caused by horses which are perpetually biting the manger. This, however, is a strained explanation; and the diversity of opinion prevailing shows that the etymology of the word has not been established.[1] The Trismus of the Greeks appears to have been a very different and comparatively trifling affection, consisting of a convulsion, or agitatory spasm, of the inferior maxilla.

[1] By many French writers, the term Tic is not less inappropriately applied to the disease denominated, by Cullen, Trismus, which manifests itself by a rigid and permanent contraction of the muscles of the lower jaw.

NOTICES BY AUTHORS.

The descriptions of Tic Douloureux contained in the writings of the ancient physicians, although sufficiently explicit to prove that they were not ignorant of its existence, are too vague and unsatisfactory to merit much notice. In the works, however, of authors of every age, there are passages which more or less distinctly refer to it. From the excruciating nature of the suffering to which it gives rise, and the frequency of its occurrence, practitioners have bestowed upon it, of late years, a great share of attention.

The first modern writer who attracted much public notice to this species of neuralgia was André, a surgeon of Versailles, who, in 1756, published a work on "Diseases of the Urethra," among which it rather whimsically happened that facial neuralgia was introduced under the present popular title of Tic Douloureux.

Dr. Fothergill next appeared in the list, and,

twenty years after the appearance of André's work, published a description of a painful affection of the face, which he describes with much accuracy: at that period the disorder became known in England by the title of "Dolor Faciei Fothergillii."

SYNONYMS.

Many other writers, comprehending some of the most eminent men of their respective times, have treated of the affection; and each has adopted a nomenclature of his own. Thus André denominated it Tic Douloureux; Sauvages, Trismus Dolorificus, and Trismus Maxillaris; Fothergill, Faciei Morbus Nervorum Crucians; Young, Autalgia Dolorosa; Heberden, Dolor Capitis Intermittens; Chaussier, Neuralgia Facialis; Goode, Neuralgia Faciei; Darwin, Hemicrania Idiopathica; Kerrison, Neuralgia Spasmodica; and other names have been given by other authors.

The inexpediency of encumbering science and

its descriptions with a host of technicalities of no definite import is here fully seen, many of the terms being open to much objection. The distinctive appellation retained by Darwin is more particularly so; as, in the first place, the cranial integument is frequently untouched; and, in the next, as I shall hereafter endeavour to show, it seldom, if ever, occurs as an idiopathic affection.

The disorder being so well known in this country by the appellation of Tic Douloureux, and the term having been appropriated to it by authors of eminence in the profession, I shall not hesitate to adhere to a nomenclature which, though obscure, is so universally recognized.

A SEVERE NERVOUS AFFECTION.

Tic Douloureux, or facial neuralgia, is a disorder essentially affecting the nerves; it occurs in paroxysms of fearful violence; and the sufferer who has experienced its full effects, driven almost to despair by reiterated torture,

will frequently consent with cheerfulness to the most violent remedy that affords the slightest prospect of relief.

OF PAROXYSMAL CHARACTER.

If it were not for the paroxysmal character sometimes assumed by Tic Douloureux, and in other instances its occurring after regular intermissions, during which there are periods of complete cessation from suffering, the patient's life would, in all probability, more frequently fall a sacrifice than it now does. As it is, these pains may "quite subdue a powerful frame;"[1] and, in some instances, they may "wear out the patient's health, and destroy him at last."[2] Mr. Swan has endeavoured to explain the cause of this intermittent action. "It may be," he says, "that a nerve cannot at first bear a diseased action without rest [why?], any more than it can a healthy one; and, *therefore*, the diseased action, after a certain

[1] Bell. [2] Bell's Operative Surgery.

period, ceases to make any impression [how this follows is not evident]; but, after this rest, the nerve acquires fresh powers [in what manner?], and is again fitted for action."[1] This, which merely reasserts a fact and yields no explanation, will, of course, apply to any disorder occurring in paroxysms.

DESCRIPTION.

Tic Douloureux, as before observed, is placed by Dr. Goode in the class Neurotica, under the genus Neuralgia, by the designation Neuralgia Faciei, and is thus described: "Lancinating pains, shooting from the region of the mouth to the orbit, often to the ear and over the cheek, palate, teeth, and fauces, with convulsive twitchings of the adjoining muscles." This is a brief and somewhat imperfect description of the situation of the affection; and it conveys but a faint idea of the character of the pain.

[1] Swan on the Diseases and Injuries of the Nerves.

That is described as exceedingly acute and lancinating, plunging through the part affected with the rapidity of lightning, or as a violent stabbing pain, which sometimes follows the course of a particular nerve, and at others is seated in its ultimate ramifications. When the face is affected, the slightest motion is sometimes sufficient to produce a paroxysm; a touch, the rush of cold air, and the action of the jaws in mastication, frequently excite insupportable agony. The muscles in the immediate vicinity of the nerve are affected with twitchings; and small hard painful knobs are often felt along its course. Local determinations frequently take place, and consequent increase of temperature; so that, when the pain occurs in the cheek, fauces, or tongue, a copious flow of saliva is produced; and tears flow abundantly when the ophthalmic branch of the fifth is affected, that being the source from which the lacrymal gland derives its principal supply of nerves.

A recent writer, who for some years suffered from Tic Douloureux, has thus portrayed his

sufferings: "On rising one morning from my bed, I suddenly felt a sharp pain. My first impression was that a wasp had stung me; but, before I could examine the part whence the pain proceeded, I received a second and more severe shock; repetitions of which occurred in the most rapid succession for about five minutes: it then ceased as suddenly as it began. Though I cannot compare the pains to anything I ever felt, (nor do I think the imagination can easily conceive, much less can words describe, the exquisite acuteness of the paroxysm,) yet I have before me a most vivid recollection of the intensity of these first sufferings. I well remember that, on receiving the second shock (the first was scarcely sharper than the sting of an insect), I was instantly thrown into a state little short of frenzy. I grasped the affected part with violence—rolled on the floor—then, suddenly starting up, ran round the room—till at length, being worn out with the agony of the torture, I sunk on the bed in a state of almost senseless exhaustion. On recovering from the stupor, I found my face

covered with a cold perspiration, and my whole body in a state of nervous excitement."[1]

The late Dr. Pemberton suffered dreadfully from Tic Douloureux, and finally fell a victim to its attacks. The sudden mode of its accession is detailed by a contemporary: "One day in the heat of summer, as he was going the round of his professional duty, with the glasses of his carriage down, he suddenly raised his hand to his face, at the same moment uttering an exclamation of anger against the coachman for the careless use of his whip, with which he supposed he had struck him on the face.—The carriage having been stopped, the Doctor insisted he had been struck, and the coachman, hurt by the supposition, confidently but respectfully persisted in the impossibility of the occurrence: however, the altercation at length terminated by the conviction of the master's confidence in the fact, and the submission and silence of the servant."

Dr. Pemberton was again similarly attacked

[1] Rev. C. Hutchinson's Narrative of Recovery from Tic Douloureux.

when the windows of his carriage were closed, and, from that time, the malady increased with rapidity. On one occasion, being in attendance upon a patient, he exclaimed, "I am here at your earnest request, but am scarcely able to sustain the transit from my own house to yours, and should not be surprised if I am attacked with a fit of my disorder;" a prediction which was too faithfully verified, for, before he quitted the house, he sunk into a chair, covered his face with his hands, and, as he suppressed his groans, exhibited his enfeebled frame distracted by indescribable agony.

THOSE AFFECTED.

Tic Douloureux affects persons of all ages, although the two extremes of life are generally considered as rendering the system less susceptible of its influence. It also attacks persons of all constitutions, the weakly and robust, and those of all temperaments and idiosyncrasies.

ITS EFFECTS.

The constitution, however strong, sympathises at length with the bodily and mental anguish; and the sufferer, although in the prime of life and in the season of youth and vigour when first attacked, soon becomes worn down and emaciated, the mere shadow of himself, a melancholy proof of the wasting effects of this dreadful disorder.

UNSUCCESSFUL MODES OF TREATMENT.

To devise a remedy against this disease has, therefore, been the unceasing aim of physicians; but the success which has hitherto attended their efforts will be best seen by here preliminarily exhibiting a brief summary of the varied and opposing methods of treatment which have been adopted.

Bleeding, both general and topical, has been recommended by some, on the supposition that the affection is accompanied by inflammatory action; and, from an opposite notion, large doses of sesqui-oxyd of iron and disulphate of quina, have been administered by others.

In order to induce a new action in the system, mercury and mercurial inunction, carried to ptyalism, have been tried. Dr. Parr asserts that in one instance he employed arsenic with decidedly good effect; but, in the hands of Dr. Thomas, this mineral completely failed.

Mr. B. Hutchinson has extolled the virtues of the sesqui-oxyd of iron, in doses of one or two drachms, three times a day; but, although in some instances success appeared to follow its administration, it has by other practitioners been proved, when uncombined, to exert no influence whatever on the malady.

Tonics having failed, powerful sedatives were tried; and Mr. Taylor of Cricklade cured some of his patients with hydrocyanic acid. Other practitioners, however, failing with this remedy,

resorted to the potassio-tartrate of antimony; and, in addition to the original pangs of the disorder, kept the patient for days together in a perpetual state of the most distressing nausea.

Then followed the most diverse and opposing treatment. The mineral acids were exhibited one day; and soda, ammonia, or liquor potassæ the next. Whilst some were making trial of belladonna, others were administering colchicum, stramonidum or the sulphate of iron, opium or the oxyd of zinc,—now iodine, then nitrate of silver, nux vomica, or valerian, trisnitrate of bismuth, musk, æther, sarsaparilla, the extract of hop, or taraxacum.

This disease having been, for many years, mistaken for a local affection, originating in the external seat to which it seemed to be confined, it is not surprising that practitioners failed in their misdirected efforts of treatment. Even in the present day, there are many who place their sole reliance in the almost inert expedient of topical applications; while some of our brethren, more rash or bolder than the rest, endeavour to

poison their patients into health by the most heroic doses of some powerful medicine. In almost every case, however, which I have treated and seen recorded (and which has not evidently been produced by organic lesion), I perceive an elucidation of the broad general principle which it will be the object of the following pages to enforce.

Local applications have been used with the most opposite intentions. Thus unguents consisting of veratria or morphia, strychnia or belladonna, delphine, aconite, or cantharides, the potassio-tartrate of antimony, or the acetate of lead, were employed, as best comported with the peculiar views of the individual practitioner.

Anodyne and stimulating embrocations, moxa, potassa fusa, cataplasms with the extract of tobacco, blisters, topical bleeding with leeches, mercurial friction, hot fomentations, ice, cold bathing, hot, tepid and vapour baths, evaporating lotions, magnetism, shampooing, electricity, galvanism, pungent errhines, cajuput oil, mustard cataplasms, issues, acupuncture, and lastly, " me-

tallic tractors," and division of the nerves, have all been tried in vain!

Extraction of the teeth has not been omitted; Sir C. Bell says—"I was in consultation on the case of a lady, who presented a very singular character of countenance. Although not old, the whole range of teeth in both her jaws had been drawn; and consequently she looked prematurely aged. The singular circumstance in this case was, that although suffering from tic douloureux, when one or two teeth were pulled, she had relief; so, in course of time, they have all been pulled. And now, although teeth, and alveoli and gums, are all gone, the disease continues!"

It cannot be disputed that some of these local applications, making a decided impression by violently altering the condition of the part to which they were applied, have in some instances effected a cure; it more frequently, however, happened, that the pain was merely transferred from one locality to another; but does not this conflicting testimony clearly prove that the nature of the

disorder has been misunderstood, and that no fixed principles have hitherto been kept in view for guiding practitioners to a rational method of treatment?

I was lately called to the case of a man who had suffered lengthened and excruciating agony from a neuralgic affection of the leg, traversing the whole extent of the tibia from the knee to the inner ancle. On examination, the limb bore ample testimony to the severity of the treatment previously adopted, as the anterior portion of it had been literally flayed by blisters and other epispastic *local* remedies. He had, however, obtained no relief; and having grown irritable by protracted suffering, and being impatient of control, he would not submit to other treatment than that which consisted of topical applications. As I left him soon after the first interview, I do not know the subsequent management nor the termination of the case.

I cannot resist the temptation of transcribing, in this place, the account given by Mr. Hutchinson, in the pamphlet already quoted, of the treatment

pursued, in his case, by "a celebrated surgeon in Kent."

"A blistering ointment," he says, "was well rubbed into my arm (the seat of the disorder) from the shoulder to the wrist, which soon occasioned a pricking sensation; this part of the operation being finished, another ointment was spread upon lint and thus applied to the affected parts; to this were affixed straps of diachylon plaster; and the whole was finally swathed by voluminous folds of several yards of linen bandage. This treatment was intended to form (as my friend expressed it) a continual vapour bath.

"I was directed to wear this portable steam apparatus for a fortnight, and during the time, to pursue a course of medicine similar to the one which I had of late been following (a tonic course). The diet was to be light and nourishing and somewhat generous, as I was allowed two glasses of port wine daily and home-brewed beer.

"At the end of the fortnight, the bandages being removed, the whole arm presented a most

unsightly appearance; being covered with a crop of pimples in different stages of maturity.

"My medical adviser, having cleaned the surface by rubbing it briskly with some detergent lotion, repeated the same treatment which he had used on my first consulting him, and referred me to his former directions. But, before the expiration of the second fortnight, I tore off the bandage, being unable any longer to endure the torture it occasioned.

"The pain arising from the irritating ointment was trifling, and the inwardly burning heat, though very distressing, was bearable; but the confined state of my arm, by adding cramp to my other sufferings, almost drove me to madness, and overpowered my resolution to persevere." [1]

I have been anxious to introduce this case to the notice of my readers, as it affords a good example of the effects which generally follow the treatment of the malady by topical applications.

Another mode of treatment is, therefore, neces-

[1] Hutchinson's Narrative, pp. 10, 11.

sary; and that can be safely founded only on more accurate physiological principles, which must now be developed.

EXTERNAL SEAT OF TIC DOULOUREUX—THE FIFTH PAIR OF NERVES—ITS SUBORDINATE DIVISIONS.

The seat of facial neuralgia is generally in the branches of the fifth pair of nerves, which are distributed among the bones of the face, to the eyes, nose, mouth, upper and lower jaw, tongue and throat.

The Fifth is the largest nerve which issues from the cranium. It is of a flattened form, and penetrates the dura mater at the anterior point of the petrous bone, and spreads flat under it, where it is matted into one irregular ganglion, called the semilunar or Gasserian. This ganglion lies on the anterior part of the temporal, and on the sphenoidal, bone.

French nosologists, taking into consideration the distribution of the fifth nerve, have divided

Tic Douloureux into four species: viz. frontal, suborbital, maxillary, and facial, and thus minutely describe it:[1]

In frontal neuralgia, the pain begins in the situation of the supra-orbitary foramen, extending at first along the branches and ramifications of the frontal nerve distributed to the soft parts upon the cranium, and afterwards shooting in the direction of the trunk of the nerve towards the bottom of the orbit. In a more advanced stage, the conjunctiva, and all the surface of the eye, participate in the effects of the disorder, and become affected with chronic inflammation, which is described as a particular species of ophthalmia. At length, the pain passes beyond the distribution of the branches of the frontal nerve, and affects all the corresponding side of the face and head. It seems as if it extended itself to the facial, suborbitary, maxillary, and even to the temporal and occipital nerves, through the communications naturally existing between their filaments. Each

[1] Cooper's Surg. Dict., art. Tic Douloureux.

paroxysm produces a spasmodic contraction of the eyelids, and a copious effusion of tears.

Suborbitary neuralgia is first felt about the suborbitary foramen. The pain extends to the inner canthus of the eye, the muscles about the zygoma, the inferior eyelid, the buccinator, the cheek generally, the ala of the nose, and the upper lip. The seat is probably in the suborbitary nerve. At a later period, the pain appears to extend backwards to the trunk of the nerve and the branches which are given off in its passage through the suborbitary canal. Hence pains are then experienced in the upper teeth, the zygomatic fossa, the palate, the tongue, and within the cavity of the nose. As the disorder advances, it may extend, like other neuralgiæ of the face, to the whole of the same side of the head. During the paroxysms, when the disorder is fully formed, an abundant salivation usually takes place. In general, the attendant toothach deceives the practitioner, who, in the belief that the pain arises from another cause, uselessly extracts several of the teeth.

Tic Douloureux of the lower jaw, or maxillary

neuralgia, is usually felt about the situation of the anterior orifice of the foramen mentale, and extends to the lower lip, chin, neck and temple. This form of complaint is more uncommon than the preceding, but, after it has prevailed some time, is equally remarkable for its intensity.

With respect to neuralgia of the facial nerve, or portio dura of the auditory, it is a case which very soon cannot be distinguished from other species of Tic Douloureux. The pains, at an early period, are no longer confined to the passage of the principal branches of this nerve between the parotid gland and ramus of the jaw; and its numerous communications with the rest of the nerves of the face seem to facilitate the extension of the disorder, so that the agony is soon felt over the whole face. The original source of the affection can be detected only by attentively considering the progress of the complaint in all its stages.[1]

Cervical neuralgia may be associated with

[1] Delpech, Traité des Maladies reputées Chirurgicales, t. III. sect. vi. p. 214.

the other forms. In the case of Mr. Clarke,[1] the muscles of the neck were so affected by spasmodic action as to draw the head forcibly round. Pure cervical neuralgia is a rare species, and is not mentioned in the Nosology of Chaussier.[2]

THE FIFTH PAIR, VITAL NERVES.

That the trifacial is a vital nerve, Bellingeri shows, first from its origin and structure. It appears, he observes, to spring chiefly from the olivary body, a sort of ganglion; and, in its structure, it closely resembles the nerves of organic life, by the interlaced arrangement of its filaments, the presence of ganglia upon all its considerable branches, its repeated anastomotic communications, the occasionally augmented size of its parts, as in the trunk, in the ciliary nerves, in the external nasal and in the posterior palatine nerve, which establishes a similitude between it and the

[1] Vide Case III.

[2] Rowland on Neuralgia, p. 100.

intercostal, and by its being uniformly accompanied by arteries—a remarkable proof of connexion with the functions of vitality. He might have added, that "it sinks into the middle cavity of the basis of the skull, in which all are vital parts."

He justly argues that the influence of the fifth pair over all the secretions, viz., the lacrymal, that of the Meibomian glands, the mucous secretion of the pituitary membrane of the nostrils, the salivary secretion of the sublingual, maxillary, and parotid glands, the mucus of the muciparous follicles of the palate, mouth, cheeks, tongue, lips, and tonsils, and even the cerumen of the ears, as well as its supplying the maxillary, sphenoidal, and frontal sinuses, the teeth, the internal parts of the ear, the pharynx, and periosteum, shows that it performs only functions proper to vitality.

He reasonably maintains that its constant association with the minute arteries of the face regulates the circulation of that part of the body; and that all the change which the colour of the cheeks undergoes in shame, rage, terror, indignation,

horror, joy, hope, and desire, are to be attributed to the influence of the fifth pair over the facial capillary circulation—a view which is far more reasonable than, and indeed utterly destructive of, the notion that all these are dependent on the facial nerve; for the trifacial extensively supplies vital involuntary parts, and the actions in question are altogether of this character, while the facial is a voluntary nerve!

That the trifacial is a nerve of involuntary action is rendered equally evident when it exclusively supplies muscular parts. The motions of the uvula, velum palati, and upper region of the pharynx, are all, as Bellingeri observes, involuntary and instinctive, and we find that those parts, with the circumflexus and the levator palati, are all supplied by the palatine nervous filaments of the fifth pair. He shows, accordingly, that though mastication and deglutition be in some degree voluntary motions, those of the uvula, palate, and upper division of the pharynx are entirely involuntary, and accomplished without effort or consciousness of the individual.

Even when the trifacial nerves supply the parts about organs of sense, Bellingeri shows that the vital part of the properties of the organ depends on them; and the mental, on the proper nerves sent to the organs.

The iris, he observes, derives its nerves from the ophthalmic ganglion, which is formed by the trifacial in conjunction with the general oculo-muscular nerve. In some rare instances, he observes, the motion of the iris has been found to be dependent on the will, and in these, he shows, that the ciliary nerves received no branches from the fifth. It is also, he states, known that, in certain species of animals, as the parrot, owl, and the rays, the circumstance of the iris being under the will of the animal is connected with the want of the ophthalmic ganglion.

The involuntary motions of the internal ear he, in like manner, attributes to the anatomical fact, that the chorda tympani consists of filaments of the lingual branch of the fifth pair extended over the cord, and to the associated fact, that the muscles of the stapes and malleus receive no

branches from the seventh pair, until the latter has been formed by the petrous branch of vidian nerve of the fifth pair, after which it immediately distributes the appropriate filaments to the muscles specified.

As to the motions of the tongue, he observes that the various nervous sources from which it is supplied are connected with the various functions assigned to it: also that the tongue performs a mixed class of motions, which are sometimes voluntary, sometimes involuntary: the involuntary or instinctive motions being those exhibited in sucking, mastication, deglutition, and crying, in which the tongue assists, and which the new-born infant exercises instinctively. The lingual branch of the trifacial, he observes, contributes to the involuntary motions, since it sends filaments to the internal pterygoid, the mylo-pharyngeus, the stylo-glossus, the lingualis, and the genio-glossus, giving those muscles some degree of organic and involuntary character.

From all this Bellingeri concludes that, though on the trifacial emerging upon the face, above and

below the orbit, at the temples, in the region of the cheeks, and at the mental hole, its filaments are immediately conjoined with those of the facial by anastomosis so close as to constitute almost one nerve, yet so far as the trifacial itself is distributed to the muscles and integuments of the forehead, nose, lips, mouth, and face generally, it contributes only to involuntary or organic actions, and the voluntary motions depend on other nerves.

He repeats, at the same time, the observation made by Gall, that the trifacial nerve is more developed than all the nerves of the head in newborn infants, and that, even in the lower animals, its size is proportionally greater than in the human subject. The life of the fœtus, then, being entirely organic, and that of brute animals as it affects the face making a nearer approach to instinctive or organic action than in the human subject, he shows that this circumstance also is in favour of the influence of the trifacial being of that kind denominated organic or involuntary.

In this manner, Bellingeri shows that the trifa-

cial nerves, whether they preside over organs of sensation, circulation, secretion, or more conspicuous motion, perform functions which are invariably independent of the will, and are to be regarded as strictly vital, and consequently that these nerves regulate all those actions, whether sensitive or motive, which are independent of the will. All this is to be understood, he adds, of that which has been called its larger, plexused, or ganglioned portion only.

CASE ILLUSTRATING THIS.

Bellingeri's account of a case of supra-orbital neuralgia admirably illustrates the truth, that the fifth pair are vital nerves.

"The patient," he says, "having, in early life, received a blow over the superciliary foramen of the left side, which caused contusion, laceration, and hemorrhage, became, some months afterwards, subject to sensations of *weight* and un-

easiness in the whole of the left frontal region, accompanied by a slight sense of *pulsation* in the place of the cicatrix. At the same time, the left eye was unable to bear the light; he was obliged to keep the eyelids closed; his vision was impeded and confused; and, when he attempted to read with that eye, *tears followed. If he took food, the evil was increased*, and prolonged a good deal more than usual.

"For several years, the patient suffered no additional inconvenience, except *constipation*, with the alvine dejections loose, scanty, and with scybala.

"In the month of March 1823, and subsequently, the pains in the left superciliary nerve continued more or less acute for about three months. During the accesses, the *frontal artery appeared rather turgid, and pulsated with great force.*

"In December of the same year, the frontal neuralgic pains were reproduced, and they extended also to the left temporal region, and were accompanied by *a remarkable increase in*

volume, and *vehement pulsation of the temporal and frontal arteries.* The disease was supposed to be an *angiotitis;* and phlebotomy was employed ten times: this treatment produced a degree of calm, but did not entirely remove the evil.

From this period till 1828, every month, and especially towards the end, he was assailed by these neuralgic pains, which nothing succeeded in removing, and which were *decisively alleviated only by general bleeding, and by the application of leeches to the head.*

"In the course of these years (from 1823 till 1828) he made the observation, that *the hair of the left side of the head was rougher, harder, and thicker than on the right side; besides, that it grew long on the left side much sooner than on the right;* so that there was a remarkable difference in the length of the hair on the two sides of the head.

"In April 1828, *the whole frontal and temporal regions, on the left, exhibited a greater development, and were more turgid than on the right side;* and this had been the case for some years.

"Incision, to divide the nerve, was accomplished on the 10th of April.

"On the twentieth day after the operation, the patient found himself perfectly reestablished: for a long time afterwards he felt no troublesome sensation in any part of the left side of the head; *he had no more pulsations* in the forehead or temples; all *the left side of the head acquired its natural volume, as on the right side;* that is, the greater development and turgidity, which had been observed before the cutting, disappeared.

"On the 12th of the following month of June, *he had an intense cephalalgia* in the right temporal region, accompanied by fever; for which *blood was twice taken. The pains of the right side of the head were thus subdued* the same day: the following morning, he awoke *affected with the analogous pains in the left temporal region, feeling a pulsation in the frontal region,* the seat of the old neuralgia: *leeches were therefore applied behind the ears;* and thus *all pains in the head disappeared.*

"A few days afterwards, he was attacked with

general spasmodic affections; sometimes in the form of direct tetanus, and sometimes the extremities, superior as well as inferior, were rigid in the state of extension, or spasmodically bent: in the course of these convulsive attacks, sometimes the intellectual faculties were unimpaired, and sometimes there was loss of understanding. The attacks were removed by the use of acetate of morphine, at first alone, and afterwards combined with sulphate of quinine. His health was thus reestablished, and remained good till the end of September, when *he was attacked by enteritis, which was cured by the antiphlogistic method.*

"At the close of June 1829, he was again visited by me, and informed me that he was no longer subject to the before-mentioned neuralgic pains in the face; he no longer felt pain on pressure of the superciliary nerve; the sense of touch was quite natural in the whole left region of the head; the motions of the muscles placed in the frontal and left temporal region were in every respect free; *the hair of the left side of the head had acquired its original softness, and no longer*

grew with extraordinary rapidity, but equally with the right side. He felt no more any inconvenience; *the state of his digestion was excellent;* and he remained perfectly cured, six years having now elapsed without any interruption of his health.

"The case described by me proves *the influence of the fifth pair on the organic functions*, and particularly of the supraorbital branch. The latter formed the seat of the evil; and greater turgidity was visible in the forehead and left temple; and that turgidity continuing proves greater nutrition in that part, and increase in the property, called turgidity: the hair, too, was rougher, thicker, more numerous, and grew more quickly on the left side than on the right; moreover, during each neuralgic access, the temporal and frontal arteries became turgid, and pulsated with great force: all which circumstances demonstrate that the morbid affection of the supraorbital nerve produced an increase in the exercise of the organic functions relative to nutrition, circulation, and vital turgidity; phenomena, all of which

disappeared after the cutting of the supraorbital nerve and the subsequent cessation of the neuralgia.

"In my inaugural dissertation, before quoted, it appears to me that I have already fully demonstrated that *the fifth pair presides by itself over the vital functions.* Such a proposition is further confirmed by the experiments of Magendie, who, having cut the trunk of the fifth pair in a rabbit, saw that the eye became dry, the iris was contracted and motionless, the cornea became opaque, and after a time white; the conjunctiva, red and inflamed, secreted a milky pus; the eyelids were covered with a dense pus; the iris became red, was inflamed, and covered with a pseudo membrane; the internal humours of the eye were turbid and opaque; the tongue became white only on that side on which the nerve was cut; thus even the epidermis was thickened, the gums were drawn from the teeth. Then it is plain, from the pathological case related by Serres, that after a disease of the trunk and ganglion of the fifth pair on the right side, there

first came on a slight ophthalmia in the right eye which increased by degrees, hence the cornea became opaque, and scurvy appeared in both jaws, but only on the right side."

From all these facts, it appears clearly what *influence is exercised by the nervus trigeminus on the organic functions in all points of the face.* Being well persuaded, with me, of this truth, the distinguished *Professor Francesco Hildenbrand did not hesitate to enumerate that nerve among those of organic life.* This was properly done, since recent physiologists have not regarded the trigeminus nerve as devoted to animal sensibility, but also to presiding over the organic and instinctive functions, and over organic sensibility or cenœsthesis, and over the sympathies, as I have fully demonstrated in my dissertation. This opinion has been also embraced by Stark, Professor at Jena.

THE LIABILITY OF THE FIFTH PAIR TO THIS DISEASE OWING TO CONNEXION WITH THE GANGLIONIC SYSTEM.

We have seen that the fifth pair of nerves are peculiarly liable to be affected in Tic Douloureux. Of this Sir Charles Bell says, "I attribute it to the influence of the sympathetic nerve, and conceive that this is the reason why the disease is so often seated in the superior maxillary nerve which has the most direct communication with the sympathetic."

ANATOMY OF THE GREAT SYMPATHETIC.

In order to comprehend this connexion, it will be necessary to take a cursory survey of the disposition of this latter nerve.

If we cast our eyes upon a plan of the Great Sympathetic, we are immediately struck with its vast connexion with all the other nerves of the

body. It is in fact an entire system characterized by peculiarities which distinguish its nerves from those which arise from the brain and medulla spinalis. It extends from the cranium to the pelvis, lying along the vertebral column; and it presents a chain of ganglia connected by nervous filaments.

The sympathetic nerves are symmetrical, and from their direct communications, are generally represented as taking their origin from the sixth pair or motores externi, and from the first or ophthalmic division and vidian branch of the fifth. Each nerve consists of three cervical, twelve dorsal, five lumbar and four sacral ganglia with their cords of connexion. Three small ganglia are also situated in the cranium, namely, the lenticular in the orbit, the spheno-palatine or the ganglion of Meckel, and a small one in the branch of communication between the anterior cerebral arteries, denominated the naso-palatine.

From the anterior border of the lenticular ganglion filaments issue, which proceed forwards to the surface of the sclerotica, namely, the ciliary

nerves; and others pass inwards and ramify in the iris. From the posterior surface of the ganglion arise two branches, of which one passes to the nasal division of the ophthalmic nerve and proceeds to the carotid plexus, the other to the inferior oblique branch of the third pair of nerves (motores oculorum).

The spheno-palatine, or Meckel's ganglion, lies in the pterygo-maxillary fossa, and forms by its branches the palatine nerve; filaments also ramify in the pituitary membrane, the soft structures of the palate and gums, the nasal fossa, the spongy bones, and septum narium, and terminate in the naso-palatine ganglion. This ganglion gives off filaments to the membrane of the palate, the carotid plexus, the middle cavity of the ear constituting the corda tympani, the gustatory nerve, and sub-maxillary gland, where it terminates in a sort of plexus.

The superior or great cervical ganglion extends from the base of the cranium to the transverse process of the third cervical vertebra. From it, branches proceed in every possible direction, com-

municating with the sixth nerve, in the cavernous sinus, and extending along the carotid artery to the minute ganglion on the arteria communicans. One filament ascends to the nasal branch of the ophthalmic nerve, which is prolonged to the lenticular ganglion; and another communicates with the vidian nerve. Branches also pass to the superior cervical nerves and to the pharynx, where they contribute to the pharyngeal plexus, communicate with the vagus, glosso-pharyngeal, lingual, facial, and fifth pair of nerves, and others, passing forward to the carotid artery, accompany its various ramifications. The other descending branches unite to form the superficialis cordis.

The middle cervical ganglion communicates with the superior and inferior cervical ganglia, sends branches to the cervical nerves, the thyroid gland, and joins the recurrent nerve. From its interior portion, the middle cardiac nerve issues.

The inferior cervical ganglion receives the communicating branch from the middle ganglion, and sends down five or six nerves which, passing

before and behind the subclavian artery, end in the superior thoracic ganglion. Branches also pass outwards and join the spinal nerves that form the axillary plexus; while others pass inwards to contribute to the formation of the pulmonary plexus. The inferior cardiac nerve is generally considered as its anterior branch.

The thoracic portion of the sympathetic nerve comprises: first, a series of ganglia which are regularly disposed along the heads of the ribs, connected by nervous cords passing from one to the other; and secondly, the plexus formed along the median line for the supply of the heart and lungs.

The cardiac plexus (ganglion cardiacum) is the common point of union of the cardiac nerves that issue from the cervical ganglia, and is the immediate source whence the different nerves proceed to supply the heart. From this plexus, some filaments pass to join the pulmonary plexus; and others turn forwards to the aorta. The descending set pass to the heart, where they divide, take the course of the coronary arteries, and form the

coronary plexus. From this plexus, branches then proceed to the heart, ramify upon the right and left auricle and ventricle, and eventually penetrate its muscular structure.

The cardiac plexus receives the cardiac nerves of each side and branches from the vagus and recurrent.

Each of the thoracic ganglia is a centre from which branches of communication proceed upwards to the ganglion above, and downwards to that below it, thus connecting the series; and filaments pass also from each to the contiguous intercostal nerve, so as to connect the nerves of organic with those of animal life.

The internal branches from the first five ganglia pass towards the middle line, some to the trachea which end in the pulmonary plexus, whilst others ramify in the œsophagus and aorta. The anterior branches unite to form the splanchnicus major, and terminate in the semilunar ganglion. Filaments from the tenth and eleventh thoracic ganglia unite to form the splanchnicus minor, which finally terminate in the renal plexus.

The semilunar ganglia in the abdomen are of considerable size, and form the centre of the ganglionic system. They are seated on the base of the crura of the diaphragm at each side of the cæliac axis. From their circumference proceed a great number of branches, which form an extensive and intricate interlacement called the solar or cæliac plexus. From this plexus, filaments pass to each of the chylopoietic viscera. Thus numerous branches pass to the liver, constituting the hepatic plexus; those proceeding to the stomach form the coronary plexus; those to the spleen, the splenic plexus; and those which lie in the folds of the mesentery receive the name of the great mesenteric plexus, from which is derived another plexus, the branches of which accompany the inferior mesenteric artery. The renal plexus is derived from the lesser splanchnic and branches from the solar plexus, from which again the spermatic plexus takes its origin.

The lumbar ganglia send branches which ramify round the aorta, and some communicate with the lumbar nerves.

From the interlacement of the ganglia of the sympathetic in the pelvis, the pelvic viscera receive an abundant supply of nerves, the filaments of which form intimate connexions with the sacral nerves.

Thus we perceive that the sympathetic nerve is in fact an entire system of nerves which is distributed abundantly to the viscera of the thorax, abdomen and pelvis, and extends universally by joining the other nerves of the head and extremities. In relation to the present subject, it is essential to bear in mind that it maintains a direct communication with the fifth whose ramifying branches are distributed universally to the face.

PHYSIOLOGY OF THE GREAT SYMPATHETIC.

By the older anatomists, the sympathetic was described as arising from the fifth and sixth pairs of nerves; but subsequent researches have proved this view of its origin to be too limited, and it is

now generally admitted that, as expressed by Sir C. Bell, "it has innumerable origins, and a universal connexion with the other nerves through all the trunk of the body. Many of the viscera to which it is distributed are entirely independent of the will, and have functions to perform too essential to life to be left under the influence of the will. The sympathetic nerve is thus, as it were, a system within itself, having operations to perform of which the mind is not conscious; whilst the extent of its connexion occasions, both in health and disease, sympathetic affections not easily traced."

Dr. Mason Goode, in his Physiological Proem on the Neurotica, says, "There is one part, however, of the system of nervous power in the more perfect animals that is particularly worthy of our attention, as furnishing a rule peculiar to itself and being without a parallel in any other part, and that is the origin, structure, and extensive influence of the great sympathetic or intercostal nerve, which forms a kind of system in itself, an epicycle within the two cycles of cerebral and

vertebral influence. It is connected both with the brain and spinal marrow, may be said to arise from either, and is studded in its course with ganglions or medullary enlargements. Thus equally enriched with the nervous stores of [Dr. Goode merely means 'Thus connected with'] the brain and spinal marrow, it sends off radiations to all the organs of the thoracic, abdominal, and hypogastric regions, to the lungs, heart, stomach, and intestines, the bladder, uterus, and testes, and thus becomes an emporium of nervous commerce and an instrument of general sympathy (!). To this is owing that nice fellowship of feeling which certain organs exhibit and which often surprises us."

It has been objected by some physiologists, that the different functions of the sympathetic and fifth pairs of nerves—one being assimilation and secretion, and the other to convey sensibility and motion — unfit them for reciprocating the attributes of each other; but it was determined by Müller, and corroborated by the microscopical observations of Ehrenberg, that while the ganglia

of the intercostal are of themselves sources of nervous energy, the nerve has intermixed with it, throughout its course, sensitive and motor filaments from the cerebro-spinal system in the same manner as twigs are in turn distributed from the great sympathetic to accompany them in their course. Dr. Wilson Philip maintains the same position, and states the ganglia and plexuses to be the means of combining the influence of the brain and spinal marrow, and of distributing this combined influence to every part of the system. It appears also from the anatomical researches of Mr. Mayo,[1] that nerves of motion are bound up in the same sheath with ganglionic nerves.

Mr. Alexander Walker is of opinion that much which is erroneous is involved in the common doctrine of the Great Sympathetic Nerve; that, in the explanation of phenomena, there is no need of assuming the mysterious notion of sympathy; that the ganglionic system is regulated by the same general law as the rest of the nervous system—its derangements being always referred

[1] Outlines of Human Physiology.

to its extremities, or, as he deems them, its sentient origins; that there is nothing more wonderful in the ganglia or central parts of that system being insensible than there is in the brain or central part of the higher nervous system being so; that *pain* referred to its extremities is the peculiar expression of derangement in the ganglionic system, which has nothing to do with touch or any other sense, as it gives no cognizance of forms, &c.; that among many proofs of pain being an expression of the ganglionic system, none is more remarkable than one furnished by this very disease—namely, that, while it lasts, the pain produced by it is universally acknowledged to be infinitely more severe than that caused by any disease of the fifth pair[1] itself, while the function of the fifth nerve is absolutely unaffected, and the relief in the intervals of the paroxysms is perfect; that, for the reasons assigned above, derangements of the

[1] "Nervous pains," says Sir B. Brodie, "are more severe, and perhaps, on the whole, more common, in those parts which receive their nerves from the fifth pair, as the face, the eyes, the tongue, than in any other individual part."—If the ganglionic system is the seat of all pain, this is explained.

sympathetic connected with the primæ viæ are naturally referred to its first filaments arising on what may be deemed the commencement of the primæ viæ, the cavities of the mouth and nose; that as these filaments there accompany the fifth pair, serving for vital sensation and involuntary motion, as Bellingeri has proved, many of its derangements are referred to the branches of the fifth pair; and that hence we ascribe to them Tic Douloureux.—This view has certainly the advantage of simplicity, and it conforms to the rule of assigning no more causes than are sufficient to account for effects.

The same physiologist gives the following explanation of Remission and Exacerbation: That these are direct affections of the nervous system, and depend on *there being performed therein two different kinds of function, the sustained existence of one of which is incompatible with that of the other*, and the neglect to observe which has caused all difficulty on the subject; that one of these functions, the deposition of nervous matter and accumulation of nervous power, may be called internal, because it is limited to the nervous system

itself; that the other may be called external, because it extends to another system—the muscular, actuates it occasionally, and more or less powerfully, and is thereby occasionally exhausted by expenditure of nervous matter; that the nervous system is liable to such exhaustion and consequent inability to act, until it is again recruited by the internal function, is proved by our consciousness or internal feeling, and by all our experience; that this exhaustion occurs in such a degree as threatens even the cessation of functions; that the very nature of muscular action and this consequent exhaustion render lassitude, repose, remission inevitable, in order to the requisite internal re-accumulation and the further performance of external function; that the very terms "exhaustion" and "re-accumulation" imply limits which cannot be exceeded, and therefore they *must* alternate with each other, if nervous action do not cease; that the duration of such remission must depend on the degree of exhaustion and the difficulty of re-accumulation in various organs; that nervous matter being then deposited during the remission, can be brought

into action again, and will of course be so, under its natural excitement; that there is consequently no case of the external nervous action in which remission and re-accumulation are not evinced; that sleep affords at once an admirable illustration and a proof of this, as it is a mere remission of nervous action, and permits a deposition of nervous matter and re-accumulation of nervous power, as we distinctly feel; that, accordingly, *from this inevitable alternation of internal and external function evidently spring Remission and Exacerbation,* which are thereby explained; that the vital system, on the contrary, having but an internal action to perform—nutrition, in its stages of absorption, circulation, and secretion, flowing as they do into each other in uninterrupted and regular sequence —requires no remission or exacerbation; and that this fact as to the vital system confirms the view which has been taken of their cause in the nervous system.

The term ganglion is found in Galen and Celsus, used to describe certain hard tumours seated in the ligaments and tendons. The gan-

glia of the sympathetic were first described by Fallopius; but the functions of ganglionic nerves were for a long time misunderstood. The ganglia were supposed by the early writers to give firmness to the nerves. Lancisi imagined them to be muscles *sui generis*, and, like other muscular textures, to be capable of contraction. This was disputed by Haller, who was unable to discover muscular fibres in their composition. He considered the uses of ganglia to be utterly unknown.

Winslow regarded the ganglia, especially those of the spinal nerves, to be so many dispersed origins of the great sympathetic; and, although he does not hazard a conjecture regarding their uses, he inclines to the belief that they are so many subsidiary brains. This opinion was revived by Winterl, Johnstone, Unger, Lecat, Peffinger, &c.

Different hypotheses are summed up in the following quotation from Monro's Treatise on the Nerves:

"Some have thought the ganglia of the nerves

to be glandular, and to perform a secretion; others, from their firm texture, suppose them to be muscular, and serve to accelerate the motions of the liquor in the nerves which proceed from them; but as no proof is offered for either of these opinions, they cannot be maintained. Others would make them serve: 1st. To divide a small nerve into many nerves, and by these means to increase the number of nervous branches. 2dly. To make nerves come conveniently by different directions to the parts to which they belong. 3dly. To reunite several small nervous fibres into one large nerve. Since no proof is brought that these three things cannot be done without the interposition of a ganglion, but, on the contrary, we see them performed where there is no ganglion, we must continue to acknowledge ignorance concerning the uses of these knots, the ganglions."

Monro, the son, in a work published in 1783, on the Structure and Functions of the Nervous System, says, "These complications of the nerves being invariably destined for particular parts, this general uniformity in connexion and distribution

must answer some purpose superior to mere mechanical contrivance." This was also the opinion of John Hunter.

These views are rather negative than affirmative of any particular function.

Professor Prochaska considers the ganglia as knots or ligatures, so tight as to intercept all communication between the heart and sensorium commune, in the calm and peaceful state of the system, but not sufficiently so as to prevent the sensorium reacting, more or less powerfully, on the heart in the agitation of the passions.

M. Percy, losing sight even of this slight indication of function, in a Report made to the Class of Physical and Mathematical Sciences of the Institute of France, on the work of M. Le Gallois, entitled "Expériences sur le Principe de la Vie notamment sur celui des Mouvemens du Cœur et sur le Siège de ce Principe," arrives at the conclusion, from the experiments of the author, that the great sympathetic takes its rise from the spinal marrow, and that the peculiar character of that nerve is to bring every part to which it is dis-

tributed under the immediate influence of the whole nervous system.

Bichat maintains the existence of an animal and an organic life distinct from each other, and of a nervous system for each of these lives. Profiting by the idea of Winslow, he regards the system of the ganglia as small brains which belong to organic life, and the system of the brain to animal life. Both the idea borrowed from Winslow, and the distinction of these two nervous systems, are highly important; but the terms organic and animal are inexpressive, all parts of the human body being at once organic and animal. Lower and higher, or vital and mental, would be more appropriate.

PATHOLOGY OF THE GREAT SYMPATHETIC.

We cannot so far depart from all legitimate analogical deduction as to assert that irritation to any considerable extent, existing in the internal organs and involving the ganglia within its

influence, can be of long continuance without some of the external and terminal nerves directly communicating with them participating in the affection.

When, by mechanical violence or other means of excitement, a strong impression is made upon a nerve in its course, or at its root, the effects are not perceptible at its central part, or at the part irritated, but are commonly observed at its extremity; and when any nerve is irritated between its origin and termination, a sensation is felt as if some injury were done to the part which it supplies.

I will digress for a moment to notice, in connexion with this subject, a curious effect which is sometimes observed, and which seems the result of general sympathy: "It is a sense common to every one, and to the system at large, and consists," says Mason Goode, "in that peculiar kind of internal but corporeal feeling respecting the general state of one's health that induces us to exult in being as 'light as a feather,' as elastic as a spring, or to sink under a

sense of lassitude, fatigue, and weariness, which cannot be accounted for, and is unconnected with muscular labour or disease. To this sensation, M. Hubner has given the name of Cœnesthesis, and several of his countrymen that of Selbstgefühl and Gemeingefühl, self-feeling or general feeling; and its organ is supposed to exist in the extremities of all the nerves of the body." I should, however, be inclined rather to view this peculiar sensation as the effect of a glow of healthy excitement of the sympathetic, or, *é converso*, a depressed state of that system, communicated from it to the other nerves of the system.

In proof that the great sympathetic nerve is capable of conveying disordered action, I shall again revert to the authority of Mr. Swan. He says, "I have been induced to enquire how the body is usually affected after accidents. From that enquiry, I have been led to state that, when a severe injury has been received, the ganglia of the great sympathetic nerve become irritated, and, consequently, the parts to which they distribute nerves. This irritation may be communi-

cated to many of the cerebral and all the spinal nerves, producing, according to the part of the sympathetic most affected, tetanic spasms varying in extent and complexity."

M. Brachet also instituted a series of vivisections with a view of elucidating the proper functions of the ganglionic nerves, and the following is the substance of his conclusions: The ganglionic system is insensible in its healthy state to mechanical injury, but acquires sensibility when in a state of excitement.

Dr. Segond, chief medical officer of the French Marine at Guiana, notices, however, a form of disease which he considers to be essentially a neuralgia of the sympathetic nerve. It prevails to a great extent in intertropical climates; and it exhibits the ganglia in a morbid state. I have abridged the following summary of the principal symptoms from the Medico-Chirurgical Review of October, 1838:

There exists for several days a preliminary sense of oppression and discomfort in the abdomen (*malaise abdominal*), accompanied with a

downcast icteric countenance, highly expressive of the uneasiness felt, and speedily followed by inertion of all the functions of organic life, and general corporeal debility. The abdomen becomes excessively distended with flatus, but unattended with tenderness. There is frequent vomiting, at first only of the contents of the stomach, afterwards of a yellow or greenish acid bilious fluid. The stools, at first frequent and loose, soon became infrequent and scybalous, and, after a short time, succeeded by costiveness. In four or five days, colicky pains occur, attacking first the duodenic and afterwards the hypogastric region: they are of an intolerably lacerating character. The pulse is slow and unequal. The tongue is white, moist, and dry, with but little thirst. The temperature is variable. The urine is scanty and disordered in quality. After a while, great pain is felt in the region of the kidneys, along the spine, and in the extremities and trunk. The general debility increasing, the limbs become paralysed or convulsed; and finally, the cerebrum, sympathizing

with the universal disorder, there are delirium, general convulsions, and perversion of the senses and intellect, &c.

Anatomical Characters. It being a disease seldom fatal, Dr. Segond had necessarily few opportunities of examination. The following, however, are the appearances witnessed in two cases after death, and they are interesting as exhibiting unequivocal evidence of extensive lesion of the sympathetic nerve. In the first case, the ganglia of the abdomen were of a reddish brown or yellowish colour, resembling agate, and hard as if hypertrophied: their branches of communication were more apparent and voluminous than in the natural state. On the right semilunar ganglion, a yellow spot was observed, not penetrating its substance entirely. The solar plexus was increased in volume; the filaments and ganglia entering into its composition, having lost their natural softness, resisted and creaked under the scalpel; the ganglia themselves were of a brownish colour spotted with yellow. The plexuses also which emanate from the solar were

large, more prominent, and more easily traced than in the normal state; in fact, were in a state of engorgement.

In the second case, all the ganglia were in a morbid state. Those of the thorax were very large and of a vivid red, spotted here and there with yellow, and their branches more turgid than natural. The swollen ganglia of the abdomen presented a yet more unusual volume; their redness not being so great, but their density greater, than the thoracic. The semilunar ganglia were also increased and cartilaginous. The solar plexus was equally enlarged, and its density much increased, and its secondary plexuses had undergone a like change.

The sequence of symptoms arising from ganglionic irritation is here exceedingly well portrayed. The pain is described as being of a twisting, tearing, and lacerating nature, apyrectic, internal, and unincreased by pressure, radiating from the ganglionic system as from a centre, and extending its influence to the limbs and every part of the body.

It is stated also by M. Pascal that, during the colic at Madrid, he found the ganglia of the great sympathetic diseased in a number of instances, and he attributed the affections of the limbs to their communications with the spinal nerves.

Colica pictonum, or Devonshire colic, according to Dr. Segond, is essentially a neuralgia of the sympathetic nerve; and the cramps and other painful affections of the extremities which accompany an attack of Asiatic cholera are occasioned by ganglionic irritation.

CAUSES OF TIC DOULOUREUX.

There is much diversity of opinion amongst pathologists regarding the cause of Tic Douloureux. Mr. Abernethy, Sir Charles Bell, Dr. James Johnson, and other writers, have assigned its origin to gastric and intestinal irritation: but the supposition has been disputed by others. The detection of the nature of disease and its

various complications can be effected only by patient and careful investigation.

Rahn seems first to have indicated the truth on this head, in 1771, by collecting several cases, to prove the connexion of nervous pains in various parts of the body with disorder of the bowels, and the importance of purgatives in their cure.[1]

It illustrates this view to observe, with Andral, when speaking of hyperæmia, that there are certain morbid conditions to which we can scarcely give another name than that of migratory fluxes, in which, in turn and without ceasing, the different organs are affected with congestion: one day it is in the uterus; another in the liver; another in the lungs; and another in the brain. In a word, there are individuals who seem to be under the necessity of having some hyperæmia; and since, as observed by Ley, local determinations of blood to the surface are found to produce excessive development of nervous energy, as is proved by its influence upon the capillaries, and in increasing heat, it is probable that congestion of the vessels of the neurilema, especially if ac-

[1] Rahn, Mirum inter caput et viscera commercium, 1771.

companied with arterial excitement, may occasion similar results throughout the ultimate distribution of the nerve.

It further illustrates this view to observe that, though Tic Douloureux manifests itself in all habits and states of the constitution, in the full and plethoric as well as the spare and delicate, yet in every case there appears a peculiar mobility of the system, or high degree of susceptibility to nervous impressions. It is still indeed an undetermined question, whether one sex be more subject to the disorder than another. André, Baillie, Samuel Fothergill, Sauvages, Thouret, and Barnard consider it more frequent in men; Pujol, John Fothergill, and Hutchinson regard it as more common in women. My own experience inclines me to the latter opinion.

Facial neuralgia and disorder of the chylopoietic viscera almost invariably coexist, and it is often exceedingly difficult, nay, almost impossible, to determine, from the statement of the patient himself, which may have been the primary affection. I have scarcely ever seen a case which was unaccompanied by dyspeptic symptoms. Some of

these may have been obscurely developed, but I am firmly of opinion, from observations which I have been enabled to make, that Tic Douloureux, or facial neuralgia, arises in every instance from an unhealthy condition of the digestive apparatus.

The case of Mr. Prowse (Case I.) is particularly valuable as confirmatory of this position, and exhibits in a striking light the connexion of the neuralgia of the face with disturbance in a remote and disordered viscus. In that instance, it will be observed that whenever the hepatic affection was present, the pains in the face subsided; and on the other hand, when the pains in the face were suddenly developed, the neuralgia of the liver invariably as suddenly disappeared.

The case of Mrs. Fox exhibits a greater complication. There was permanent neuralgia of the lower jaw, arising from mechanical irritation of the nerve caused by necrosis of the bones which remained incurable; and excruciating agony in the tongue arising from visceral derangement, as manifested by the pain which was felt in the region of the right hypochondrium, which yielded to appropriate treatment.

It is not, however, necessary to my position that, in all cases, the evidence of gastric or hepatic derangement be unequivocally manifested, since the sensibility of the internal surface of the stomach and intestines, or, in other terms, the ganglionic sensibility, is not the common sensibility of the nerves of the skin; the former being insensible to the touch and the application of ordinary stimuli. They are, however, endowed with a peculiar sensibility unaccompanied by perception and consciousness, which has been termed organic, and which, when unduly excited, is sufficient to produce tetanus, convulsions, many anomalous affections, and even death, without pain or the consciousness of any sensation in the seat of irritation. Thus, a worm in the intestines will cause epilepsy, convulsions, or transient blindness, and this state of the ganglionic system calls a higher one into action.

"In the cases of Tic Douloureux," says Mr. Abernethy, "which have fallen under my observation, the digestive organs have been greatly disordered, and I have cured patients of the former malady by correcting the latter;" and he

inserts the following case as illustrative of the fact: "A gentleman, who had suffered for fifteen years from Tic Douloureux in his face, became completely relieved in the course of a few weeks by attention to diet, and the regulation of the functions of the digestive organs. He afterwards evinced the degree of his amendment and his exultation at his recovery by telling me the following story: 'When I returned home, I one day met,' said he, 'my doctor in the market-place, where I had bought some good pears. I gave him half of them, and told him I would lay a wager that I would eat my share first. The doctor was astonished,' continued he; 'for he knew that I might as easily (like Mutius Scævola), have put my hand into the fire, as a cold pear into my mouth during the last fifteen years.' The relief, indeed, was not permanent; for the means, by which it was procured were not persevered in." This, of course, was long subsequent to the early enunciation of this view by Rahn.

"There are cases," says Sir B. Brodie, "in which you cannot trace Tic Douloureux to its

real source. There is something or other, somewhere or other, in the system, which acts as a source of irritation to the nerves of the face; but where that something is, and what it is, we cannot discover. Indeed, generally speaking, I should say, that nothing is more difficult than to trace any local nervous affection to its real source. The disease may be in one part of the body, and the pain or spasm which it produces may be in another.[1] I have known a patient have violent neuralgia of the foot, which depended on a stricture in the urethra; and which, whenever it occurred, was invariably relieved by the use of the bougie. I have known another patient have neuralgia of the foot depending upon internal piles, which came on when the piles protruded, and went away when the piles were reduced."

Elsewhere, however, he more definitely says, "The mucous membrane of the stomach and intestines presents a very extended surface, on

[1] This difficulty was, no doubt, chiefly owing to our ignorance of the ganglionic system as the seat of all these affections.—R. H. A.

which a multitude of nervous filaments are distributed, maintaining an extensive sympathy between these organs and the rest of the system. This membrane is subject to various causes of irritation, to which nervous affections, showing themselves even in distant parts of the body, may not unfrequently be traced. Hence it is that these diseases are, in some instances, relieved or cured by an adherence to a well-regulated diet, by the exhibition of purgatives, of what are called alterative medicines, and of others which tend to improve the disordered secretions of the stomach and liver."

Latterly, Sir Charles Bell has insisted upon the efficacy of this treatment, and has detailed cases of facial neuralgia, where it was attended with complete success.

" I believe," he says, " that irritation in certain parts of the canal produces neuralgic pains in more remote parts; and that one character of these sympathetic pains is their recurrence depending on the process of digestion.

" When Sir Astley Cooper lectured before the

College of Surgeons, he exhibited the intestines of a dog, which has been fed some hours before. The chyle was exhibited adhering to the surface of the jejunum, and the corresponding mucous coat in a high state of vascularity. This was the excitement of a part during the performance of its natural function; and, but for that consideration, we should have called it inflammation.

"My reader will draw the just inference. In the progress of assimilation of food, distinct parts of the intestinal canal are brought successively into action; it has also to be recollected, that this canal is estimated to be in length seven times the height of the body. Is it, then, an extravagant conclusion, that a morbid condition, or irritation, or functional disturbance, may take place in this canal, causing pains of remote parts, and that they shall vary according to the part of the mucous membrane under disturbance?"

Neuralgia of the face may, in some instances, be determined by decayed teeth, which, acting as foreign bodies, excite irritation of the dental nerves, and through them of the uniting branches

of the other nerves of the face. It may also, sometimes, be perpetuated by lateral pressure proceeding from the too close contact of the neighbouring teeth: in the latter instance, the root of the tooth acts as a mechanical irritant to the nerve by which it is supplied.

The method of detecting this form is by attentively examining the state of the gums: if heat and redness be perceived, the nail of the index-finger should be gently pressed upon the cervix or neck of the suspected tooth; and, if the gum be slightly detached from this point, and the pressure of the nail continued upon the periosteum, a sensation of pain and an aggravation of the symptoms will be produced. The experienced dentist will remove the pressure by an instrument resembling a small watch-spring saw, or the flat file.

Other exciting causes have been enumerated: such as blows, fright, suppression of sanguineous discharges, currents of cold air, damp, and whatever may cause depression of the system. The first, when confined to a spot, act merely by

determining the external seat. In the case of Mr. Hutchinson, from whose pamphlet I have already drawn somewhat largely, the disorder was centred in the thumb, determined thither by the sudden concussion caused by throwing a weight; the proximate cause, as shown, being irritation of the liver. The others evidently act by deranging the digestive organs, or disturbing the balance of the circulation, and thereby throwing more blood than natural upon the internal organs.

Neuralgia frequently coexists, and alternates with ague arising from malaria, and prevails in marshy districts. Dissections of those who die whilst labouring under an intermittent exhibit a morbid state of the viscera of the abdomen and thorax, but the liver, spleen, and mesentery are particularly affected. Neuralgia also accompanies epilepsy, hysteria and hypochondriasis.

PROXIMATE CAUSE.

We now arrive at the consideration of the proximate cause of Tic Douloureux; and, for the

elucidation of the subject, it will be necessary to bear in mind the physiological relations and the pathology of the great sympathetic nerve. It should, however, be remembered, that, in many cases, there exists a distinct local cause to account for a neuralgic affection of a particular seat; such, for instance, as the involution of a nerve in a contracted cicatrix, pressure by tumours upon a particular branch, especially by the small subcutaneous tumour described by authors; affections of the spinal cord producing disturbed actions in the organs supplied by nerves emanating from the diseased seat, &c. &c.

Of these, I do not propose to speak further. It is to that species of Neuralgia to which the term Idiopathic has been applied, or that which appears to arise spontaneously and according to Brodie, *without an apparent cause*, and which has led to the diversity of treatment I have before mentioned, that I shall now devote my attention.

Tic Douloureux, or Neuralgia Facialis, is, if I may so express it, merely an effect, the *cause* being

irritation of a peculiar kind which manifestly acts, not primarily on the extremities of the nerve, but on its central part. The viscus most exposed to this primary disordered action giving rise to Tic Douloureux, is the liver, which, as we have already seen, derives its nerves from the great solar plexus, and has connexion with the nerves of the stomach, and par vagum. In many instances, the affection can be distinctly traced, the pain in the face alternating with great regularity with a neuralgic affection of the liver; and, even where the alternation of pain is not so evidently marked, minute examination will generally detect some aberration of function, such as diminished secretion giving rise to indigestion, costiveness, clay-coloured stools, &c. This diminution of secretion may take place in an organ passively congested owing to the blood finding an easier access into the inosculating veins from the increased diameter of the capillaries than through the pores of the capillaries into the ramifications or cæca of the excretory tubes, owing to the morbid alteration of their physical condition; the

pores themselves having become obstructed by the swelling or thickening of the parietes of the cæca.[1]

"If it be now asked in what the irritation of the ganglionic centre consists, an answer can be found only in the phenomena that are observed in the viscera, and particularly in the epigastric region. These phenomena are undoubted evidences of augmented nervous function; sensations and movements take place and are felt which are not recognized by the brain in the healthy condition of the viscera. Of such, therefore, the proximate cause can be only a state of nutrition in the ganglionic centre, which supposes increased influx and retention of the vital fluid, the blood, from which all deposits, solid and fluid, are made."[2]

Thus we perceive that the term *idiopathic* cannot with propriety be applied to a disorder affecting the remote extremities of nerves; for reason and experience both inform us that their

[1] Billing's Principles of Medicine.

[2] An Exposition of the Symptoms, Nature, and Treatment of Neuropathy, by Dr. Gully.

ultimate ramifications are not liable to primary disease, but that it must depend upon their more central parts, and being by the common law referred to their extremities, it gives rise to a seeming aberration of function.

The progress of Tic Douloureux appears to be as follows: First, disordered function from irritation of the proper nerves of the organ, arising from some noxious influence or impression which exhausts the nervous influence whence the capillaries derive their power. They thus become weakened, allow of over-distension, and are in a state of passive congestion or hyperæmia. The more vascular portion or cineritious substance of the sympathetic being involved, it becomes irritated, and an undue supply of blood is consequently maintained. The proximate cause still continuing, the medullary part of the nervous system suffers, and evinces its effect by painful spasmodic contraction, not necessarily in the seat of the affection, but oftener at the origins of the expanded sentient nerve in direct communication with the sympathetic.

NATURE OF TIC DOULOUREUX.

A nerve morbidly excited will produce what Bichat has denominated an exaltation of function by vascular congestion and irritation of the nerve itself, perhaps even of contiguous parts, from which the nerve derives its arteries, upon the due action of which the ordinary performance of its function depends, and by which the ordinary attributes of the nerve are increased. And since local determinations of blood to the surface are found to produce an excessive development of nervous energy, as is proved by its influence upon the capillaries in increasing heat, it is probable that congestion of the vessels of the neurilema of the trunk of a given nerve, especially if accompanied with arterial excitement, may occasion similar results in the ultimate distribution of that nerve.[1]

Except, however, as Sir B. Brodie observes,

[1] Ley on Laryngismus Stridulus, p. 319.

when decided inflammatory action has presented itself, dissections fail to disclose the nature of the primary affection which gave rise to the pain: the natural sensations of a part may be increased, diminished, or otherwise perverted, although no disease exists in it which our senses are able to detect either before or after death.

After the disorder indeed has been of long standing or unusually severe, there is no doubt that a morbid thickening of the neurilema may take place, and that it may be accompanied in some cases by a reddish or even violet tinge, and studded with minute ecchymoses, as observed by Martinet: in other words, long-continued and violent morbid actions may induce genuine inflammation; but this event is not of frequent occurrence. The Baron Larrey describes it as a chronic inflammation of the neurilema or investing sheath; but his conclusions are drawn from dissections of the most violent cases.

Tic Douloureux, then, in the great majority of instances, is not of a decidedly inflammatory nature; dissections fail to indicate the slightest

trace of inflammatory action; the pain also shifts its seat in many cases with great rapidity, fixes on a part instantaneously after a long interval of perfect ease, and is seated at the remote extremities of nerves at a distance from the seat or cause of the affection; the intervening nerves, meanwhile, although the medium of communicating the morbid influence, retaining their integrity. Pressure upon the part is endurable, and not unfrequently materially alleviates the suffering.

IRRITATION OF SYMPATHETIC NERVE AFFECTING ITS REMOTE EXTREMITIES.

It was long the predominant opinion, that the brain was the sole source or centre of nervous energy; but the experiments of M. Le Gallois show that the different portions of the medulla spinalis form centres from which the nervous actions of corresponding parts of the body proceed, and to which they also tend. Mr. Abernethy also states his opinion that disorders of the diges-

tive organs sometimes affect the different portions of the medulla spinalis and produce sympathetic disorders of the body and limbs, without operating through the medium of the brain, as was first supposed.[1] And Dr. Marshall Hall has taken up and extended those views.

Sir B. Brodie says, "An impression made on one part of the body will often produce a nervous affection elsewhere at a distance from the original seat of the disease, and where no such obvious explanation of the fact presents itself. A disease in the liver produces pain in the right shoulder; a disease in the heart produces pain in the back." —The motion of a worm in the intestinal canal will produce transient blindness, or convulsions.— The following case is from Sir B. Brodie's treatise on Local Nervous Affections: "A gentleman awoke in the middle of the night labouring under severe pain in one foot, at the same time that some other sensations to which he was not accustomed indicated the existence of an unusual quantity of acid in the stomach. To relieve the

[1] Conditional Origin of Local Disorders.

latter, he swallowed a large dose of an alkaline medicine. Immediately on the acid in the stomach having been neutralized, the pain in the foot left him."

The late Dr. Wollaston was accustomed to relate the following "He ate after dinner some ice-cream which his stomach seemed incapable of digesting. Some time afterwards, when he had left the dinner table to go to the drawing-room, he found himself lame from a violent pain in one ankle. Suddenly, he became sick; the ice-cream was rejected from his stomach; and this was followed by an instantaneous relief of the pain in the foot."

A medical gentleman informs me that travelling once by sea, he was suddenly seized with an acute and agonizing pain in the supra-orbital branch of the fifth, which persisted until free vomiting ensued, during which a quantity of bile was ejected from the stomach. In this case we are enabled to trace a succession of phenomena, the effect of a complicated reaction. The organ primarily affected is the brain, with which the liver

secondarily sympathises; a quantity of an irritating fluid is regurgitated into the stomach; and the nerves of a remote seat are spurred into inordinate and morbid action through the agency of the great sympathetic nerve.

TREATMENT.

Keeping in view the principles I have endeavoured to inculcate in the preceding pages, the indications to be attended to in the treatment of Tic Douloureux are, to relieve the irritation of the abdominal viscera, and, in cases of long standing, the consequent hyperæmia which may have been induced. For this purpose, I have found the free use of aperients of unfailing efficacy, and I give a decided preference, over all others, to a pill combining a small quantity of croton oil with stomachic aperients.

In plethoric habits, and when the constitution has not materially suffered by protracted agony, the aperient plan should be steadily persevered in

and carried to its full extent; that is, the patient may be kept under the influence of purgatives until the pain has subsided.

The diet, which of course must be carefully regulated, should consist of light and nutritious food; all indigestible aliment should be avoided; and irritating spirituous and fermented liquids absolutely prohibited.

Exercise in the open air is particularly desirable, as it tends to the "equalization of the circulation:" not, however, that exercise which consists in the luxurious rolling of a carriage, but brisk walking on foot until a glow is excited, or, what is still more desirable, horse exercise.

By these means, and these alone, I have succeeded in curing inveterate cases of Tic Douloureux in the course of six or eight days, which had withstood for months and years every other method of treatment.

But suppose a weak and delicate female, with anæmia, to be the subject of Tic Douloureux, in whom the periodical functions of the uterus are irregularly performed, or in whom the disorder

is complicated with hysteria or other affections connected with an irritable and mobile state of the system—in this case, purgatives must be resorted to with great caution and in very small and divided doses; still they must be used, and alternated, as occasion may require, with ammonia, steel, the vegetable bitters, sedatives, &c. It is in these instances that quina and the sesqui-oxyd of iron produce such marked and decided relief.

The question has been frequently asked "Can Tic Douloureux be permanently cured?" In contravention of the authority of our great names, I answer, Yes! as permanently and effectually as any other disorder to which the human body is subject. I would in return ask of those who doubt this fact, if hysteria can be cured, continued fever, phrenitis, chronic hepatitis, spasms, convulsions, or any other disease or affection which may occur to the imagination at the moment?

It is true, it will be said that we may, by appropriate remedies, cure any of these disorders; but can we ensure the patient immunity from future attacks to the end of his life? The same

exciting cause, *cæteris paribus,* operating upon a frame peculiarly liable to a particular form of disorder, in other words operating upon the idiosyncrasy of an individual, may undoubtedly, at any future period, produce the symptoms it has before occasioned; but this I maintain, without fear of contradiction, that by striking at the root of the evil and not wasting opportunity in temporising with inert and worse than useless topical applications, Tic Douloureux is an affection which yields, I had almost said, with peculiar rapidity.

Such, then, are my views regarding the Seat, Nature, and Cure of Tic Douloureux.

Objections, I am aware, may be raised, owing to the obscurity which involves the subject, as to the correctness of the idea of the proximate cause; but, that the sympathetic nerve is affected, and that this irritation is productive of the local mischief in nine cases out of ten in the expanded branches of the fifth, or rather the ganglionic nerves which accompany these, I am quite convinced from the history of every case into which I have had an opportunity of enquir-

ing. Moreover, the experiments of Mr. Swan, M. Brachet, Dr. Segond, &c. &c. bear out the assertion, that the sympathetic nerve when irritated is capable of conveying, and does convey, disordered action to its own extremities in the most remote parts of the human frame.

The action of appropriate remedies in Tic Douloureux is very decided when exhibited with a view of removing the proximate cause, whatever it may be, which gives rise to the local affection; and, to me, it is not a slight recommendation in favour of purgatives, that the first doses sometimes produce a slight aggravation of the original pain, as it goes far to prove that the remedy has, as Dr. Pring expresses it, an "indentity with [a relation to] the seat of disease." This effect, however, is speedily followed by distinct remission.

Rheumatism treated by colchicum is sometimes materially aggravated on its first exhibition; but every practitioner knows that this, so far from being an untoward symptom, is in fact a *signum salutis*, and the very event he anticipated. I have

known patients experience, after a full dose of colchicum, not only a material heightening of the pain of rheumatism for some hours, but a peculiar creeping sensation over the whole body almost amounting to formication; and, when this has been produced, I have invariably had the satisfaction of finding that the disorder was speedily subdued.

The expression, however, "identity with the seat of disease," as elucidating the *modus operandi* of remedies, expresses nothing. When the proximate cause is discovered, the selection of appropriate remedies is comparatively easy; but when unattainable (as it is in a great number of instances), we can depend only upon analogies to guide us, drawn from careful observation of the phenomena of other diseases possessing certain symptoms in common with the one under our immediate notice.

Supposing Tic Douloureux to arise from the cause I have mentioned (irritation), what, I would ask, can be more rational than the method of treatment I have here recommended, namely, by

purgatives which, by a species of counter-excitement of a neighbouring organ (the stomach) relieve the irritation and consequent morbid sensibility, unload the distended capillaries, and give them time to recover their lost power? Whether this be the true solution or not, may be questionable; but I can safely affirm that I have found the treatment founded on it efficacious beyond my most sanguine expectation.

To explain more fully. An irritant is applied which produces contraction of the capillary vessels; the secondary result of the contraction is relaxation, the loss of contractility having been occasioned by previous over-action, which causes at last a loss of power; so that the vessels supplying the part admit more blood into their distended orifices than natural, and are in a state of passive hyperæmia. M. Andral states that several circumstances conspire to give rise to this distended state of the capillaries of internal organs, in the stomach, for instance, from a too active digestion in persons predisposed to the affection.

The views of Sir Charles Bell are in accordance with these.

"There is no disorder," says that surgeon, "of the stomach or bowels strictly local or limited. The various secretions which are poured into the canal, into the stomach, or duodenum, are furnished under the influence of the canal, and are as necessarily deranged as the action of the bowels themselves, when under irritation. The mere evacuation of the bowels appears to remove many disorders; but evacuation implies not only the muscular action of the canal, but vascular excitement, and the pouring out of secretions from the mucous surface; and more than that, from the subservient glandular viscera. Such a view implies purging into the intestinal canal: the relief to secretions which are pent up. If we look to cases—and more especially to those which are called Nervous Affections—the cure has been preceded in many of them, not merely by the discharge of the bowels, but by dark and fetid evacuations, in quantities to make the practitioner express his surprise from whence it comes.

These are attended with a subsidence of the tension of the upper part of the abdomen, and relief of sensations, difficult to be expressed, in the precordia.

"Mr. Abernethy put his practice on true pathological principles, when he said, 'I think it probable that the profuse discharge which sometimes follows the continued exhibition of purgatives consists of the morbid secretions from the bowels themselves, and not the residue of alimentary matter detained.'

"The action of a vomit is not the mere evacuation of the stomach, but the diaphragm and abdominal muscles, indeed, the whole class of respiratory muscles, from the groin to the glottis, are highly excited and in action; the abdominal viscera are compressed and agitated, and the secretions are poured out. Hence, surely, it is, that a vomit acts so surprisingly in the removal of many complaints.

"Even the mere excitement of secretion, by smaller doses, which do not bring the muscular system into action, has powerful influence.

"In regard to the intestines, also, I need hardly point out here, that the canal cannot be excited without an increase of activity in the whole extensive arterial system of the abdomen; that the blood is consequently urged forwards in all the branches leading to the vena portæ; that the blood thus urged into the liver must as certainly excite to the secretion of bile, as the increase of respiration excites the lungs and heart; that by the pouring of bile into the intestines, as their natural purgative, the circle of relations is completed; the action and reaction that take place when the bowels are stimulated.

"With respect to these neuralgic pains, circumstances have impressed upon me the belief that the true Tic, though remotely seated in the branches of the fifth nerve, has its source in the intestinal canal.

"What then, I may ask, would be the conclusion of any enquiring mind, when he found a peculiar purgative acting powerfully, but not more powerfully than other forms previously given, attended with immediate and permanent

relief of symptoms? Mine, I confess, was, that it acted directly on that portion of the canal, the irritation of which, or, as Mr. Abernethy would have said, 'the discontented state of which,' produced the remote pain.

"Reviewing my experience, I think I am borne out in believing that the disturbed function of particular parts of the intestinal canal gives rise to pains differing in their apparent places according to the portion of the canal irritated. Here I conceive there is a wide field for enquiry. If the intestinal canal is estimated at seven times the length of the body; and, if it be also acknowledged, that different portions of this long tract of mucous membrane perform distinct offices, and are subject to different influences, there is nothing to repel the idea, that those portions, being in a condition of disturbance and irritation, shall produce a variety of symptoms, especially differing in their apparent locality.

"And this view is countenanced by the effect of medicine. We can throw the influence of evacuants on the different portions of the canal,

affect the stomach, the duodenum, the long intestine, the colon, or the rectum. Thus is each portion of the intestine proved to be distinct in office, and to possess distinct affinities.

"It is on this principle that we ought to pursue the enquiry: first, on what part of the extended canal does this secret disturbance fall; and, secondly, what form or combination of medicine shall especially touch or influence the part affected."

The therapeutic indication, is as I have already stated, to relieve the peculiar irritation which gives rise to the distended state of the capillaries; and this may, perhaps, be effected either by removing the proximate cause itself, or by relieving the distension which has originated from it.

I cannot agree with Dr. Billing, that purgatives, of whatever nature, act by withdrawing or abstracting the nervous influence. On the contrary, their primary effect is to impart new life and vigour to the debilitated capillaries, stimulating them to action, and thus enabling them to con-

tract upon their contents, which action being renewed by small and repeated doses, the parts at length assume their natural function, as the surgeon will sometimes resort to the judicious application of an artificial irritant to the surface in order to overcome or lessen one arising spontaneously in any part of the body.

This is the rationale of the action of stimulants, such as ammonia, so highly vaunted by some practitioners for the cure of Tic Douloureux; and also of galvanism; tonic remedies, as bark, iron, arsenic, &c.: it also shows the precarious and often most injurious mode of treatment by large doses of narcotics and sedatives, which add to the already debilitated state of the parts affected.

Sir B. Brodie, in the case I have quoted, employed mercury with beneficial effect; the operation of which is explained on the principle above mentioned. In a general way, however, mercury will not cure Tic Douloureux, unless persisted in to an inconvenient extent, or for a great length of

time; and frequently it appears to have no effect in the disorder, as I have had opportunity of witnessing in instances where the patient had previously taken a quantity of the mineral without benefit. In its curative properties, it admits of no comparison with the combination I have mentioned, the peculiar efficacy of which will be shown hereafter.

As auxiliaries to these methods, great benefit will be found to accrue from the use of colchicum and small doses of tartar emetic. The former acts beneficially upon the capillaries in restoring the secretion of the liver; and the latter is of decided utility, if, in conjunction with the pain, there be symptoms of pyrexia accompanied by turgescence of the neurilema.

In many cases also, if there exist great irritability of the system (which perpetuates the local mischief), sedatives are indicated; and by far the most efficacious is a combination of conium and hyoscyamus, blended with a small portion of

ipecacuanha. The majority of these remedies may be combined, or, as in the case of tonics, alternated as symptoms require, with the purgative plan.

In illustration of these general principles, the reader is referred, for details of treatment, to the Cases of Tic Douloureux immediately following the next Section.

SECTION II.

OTHER AFFECTIONS

OF

THE GANGLIONIC SYSTEM

ARISING FROM THE

SAME CAUSE WITH TIC DOULOUREUX.

OTHER AFFECTIONS

OF THE

GANGLIONIC SYSTEM.

HEPATALGIA, OR PAINFUL AFFECTION OF THE LIVER.

HEPATALGIA, as this disorder has been termed, has not received the attention from authors which the frequency of its occurrence demands. Andral, in his "Clinique Médicale," alludes to it in the following passage: "We sometimes observe, in the region of the liver, severe pain which cannot be accounted for, after death, by any lesion of the viscus or its excretory ducts. These are cases of Hepatalgia or Hepatic Colic. The circumstance just mentioned and the nature of the pains, their intermission and the state of good health which often exists in the intervals, all lead us to believe that these pains have their site in

the numerous nervous filaments distributed to the liver, and derived from the pneumogastric or the great sympathetic."

It is generally supposed that females of hysterical tendency are peculiarly liable to this form of Neuralgia, and it cannot be denied that it often coexists with the other symptoms of Hysteria; but abundant examples are not wanting in the other sex. Almost every case of Tic Douloureux which has fallen under my observation has been complicated with Hepatalgia. The case of Mr. Prowse is an excellent illustration of Metastatic Neuralgia of the liver. I was lately consulted by a gentleman who had laboured under permanent Hepatalgia, which, for a long period, by several medical practitioners, had been mistaken and treated for chronic inflammation, not only without benefit but to the material aggravation of all the symptoms.

Hepatalgia is characterized either by constant pain in the region of the liver, with occasional violent exacerbations, or by pain occurring in paroxysms, the intervals being free. It is un-

accompanied by fever or swelling. The bowels are generally inclined to costiveness; but the alvine evacuations are not otherwise materially affected. The urine is sometimes scanty and limpid; and at other times, more profuse than natural, but without being tinged with bile. The tongue, as in many other nervous disorders, is not indicative of any morbid action; and there is no undue thirst.

The diagnosis of this affection is to be drawn from the violence of the pain, which is often much greater than that of inflammation; its tendency to assume an intermittent character; and the violence of the exacerbations, which come on with something like periodical regularity; combined with the *absence* of fever, the coated tongue, and other indications of structural disease.

The treatment of Hepatalgia, when it occurs in patients of robust habit, consists of free purgation with the ol. tiglii, combined, as the case may require, with sedatives. In debilitated constitutions, or hysterical subjects, the purgative plan must be resorted to with great caution, but its

employment is indicated by the torpid state of the bowels which generally accompanies the affection. Much benefit will be subsequently derived from mild tonics, especially the preparations of iron.

The empirical use of mercury (the sheet-anchor of many practitioners in *all* hepatic affections) has, in many instances, been found highly prejudicial; it never fails to aggravate the malady; and long continuance of its employment frequently induces lesion of the nervous system, which, but for the timely exhibition of tonics, would probably terminate in an incurable malady.

PALPITATION OF THE HEART.

Haller maintained the doctrine that muscular contractility is inherent in the muscular fibre, and is not necessarily called into action through the medium of the nervous system, but only by the application of an appropriate stimulus to the muscular fibres themselves. Thus the blood

which flows into the cavities of the heart is the natural and habitual excitant of that organ, while the muscular fibres of the intestines are called into contraction owing to direct excitation, by the ingesta contained in their interior. We have abundant evidence, however, of the fact that the heart is affected sympathetically in hysteria, dyspepsia, chlorosis, gout, rheumatism, hypochondriasis, mental impressions, and various other irritations, all of which may be referred to nervous sympathy. "No symptom," says Dr. Conolly, "more frequently arises from disordered stomach than palpitation; and such may be its origin in many cases of hysteria."[1]

Fortunately, there is not much difficulty in distinguishing nervous from organic palpitation, if to the general symptoms be added a knowledge of those afforded by auscultation and percussion.

Sympathetic Palpitation is characterized by various symptoms, of which the following may be taken as the abstract: 1. A tumbling or rolling

[1] Cyclopædia of Practical Medicine.

motion, with a momentary feeling of fulness, tightness, or oppression. 2. A series of quick, weak, fluttering, irregular beats, with a quivering sensation in the epigastrium, occurring at distant and irregular intervals, or several times a day, especially when the patient is startled. It frequently supervenes at bed-time, keeping the patient watchful and restless during a considerable portion of the night. Individuals, especially females, characterized by a delicate frame and languid circulation, are predisposed to this variety. 3. Perfect Palpitation, with irregularity, accompanied with more or less difficulty of breathing, the attack being occasional, and occurring several times a day, or lasting, with little intermission, for several days together, and being of common occurrence in dyspepsia, complicated with hypochondriasis or hysteria.

In Sympathetic Palpitation, the contraction is less remarkable for force than for an abrupt, bounding, and jerking character.[1]

[1] I have abridged this description of the varieties of Sympathetic Palpitation from an excellent article in the Cyclopædia of Practical Medicine, by Dr. Conolly.

Nervous or Sympathetic Palpitation may be distinguished from that arising from organic disease by the following signs: Its not being excited but relieved by corporeal exercise; its disposition to supervene at night; the general prevalence of nervous and dyspeptic symptoms, and the fluttering at the epigastrium; the pulse and action of the heart being natural during the intervals between the attacks. It is, in short, *intermittent*, its causes being only occasional; whereas organic palpitation is *continued*, its causes being constant.

A gentleman, closely allied to me, had been the subject of sympathetic palpitation for upwards of a twelvemonth. It was during the *alkaline era*, and he was constrained to swallow daily, for a fancied superabundance of acidity in the stomach, large doses of the sesqui-carbonate of soda, combined with vegetable bitters: still the affection remained unabated. Upon questioning him, I found that he could take not only moderate, but even violent, exercise, without aggravating the symptoms, and the pulse was

soft, weak, and slightly intermittent during the irregular intervals between the attacks. His general health was not much affected; his appetite was good, and his bowels tolerably regular. The *stimulating* salt and tonics were immediately discontinued, and he was daily purged rather freely with the ol. tiglii combined with pil. rhei comp. In less than a week, the symptoms vanished, and he has since continued free from the affection.

The irritation giving rise to nervous palpitation is that which frequently produces neuralgia; and it may be removed by the same treatment as that recommended in Tic Douloureux.

SYMPATHETIC HEADACH.

Cephalalgia or headach is produced by a variety of causes, and assumes various shapes. It is, therefore, of the first importance to distinguish the pathological conditions on which it depends. The following classification of head-

aches has been adopted by authors: 1, The Congestive, from congestion occasioned by increased or diminished vital action of the heart and blood-vessels; 2, The Inflammatory, from inflammation of the membranes or substance of the brain; 3, The Sympathetic, from disorder of the digestive, biliary, uterine, urinary, and other organs; 4, The Organic, from structural change of the bones of the cranium, the membranes, or the substance of the brain; 5, The Neuralgic, from affection of the nerves distributed to the integuments; 6, The Metastatic, from metastasis of disorders; 7, The Intermittent, occurring at stated periods. The last may embrace the sympathetic, neuralgic, and metastatic varieties.

For our present purpose, it will suffice to notice those only which depend upon sympathy with other organs.

If the stomach be deranged, and nausea or vomiting be the prominent symptom, it has received the name of "sick headach." If the liver or biliary apparatus be affected, it is denominated "bilious headach." If it accompany

indigestion, it is known by the term "dyspeptic headach."

Sympathetic headach depends upon derangement of the stomach, liver, or alimentary canal, and arises from direct morbid irritation of the nerves supplying these respective parts. It may be distinguished by the foul state of the tongue, and the improper performance of the digestive functions. The pain is often diffused over the whole head; but it is sometimes circumscribed, and confined to the forehead or one temple. It is either dull, heavy and oppressive, or acute, sharp and lancinating, and is usually perceived in the morning when the patient wakes. Nausea is present, and vomiting sometimes occurs, when the remains of an indigested meal or ingesta mixed with bile are discharged.

The symptoms are mitigated or entirely disappear for a time after the vomiting; but they return and run a similar course, frequently for many days, or until the diet has been properly regulated and purgatives have been taken.

Sometimes the headach arises after a full meal.

In these cases, the pulse is generally low and weak, the tongue furred, and the bowels costive.

The treatment of sympathetic headach is aided by all the means adapted to the removal of the accompanying dyspepsia; such as light diet, regular exercise in the open air, aperients, and such measures as promote the regularity of the secretions.

In derangement of the biliary functions, in addition to the general treatment, it will be necessary to combine with the purgatives such medicines as are supposed to exert a specific action upon the liver. Local bleeding is sometimes indicated, if pain increased by pressure exist in the neighbourhood of that viscus, and is associated with a strong, rapid, or oppressed pulse.

NEURALGIA SPINALIS.

Neuralgia of the spine is described by authors under the designation of "spinal irritation." It is frequently produced by the same cause which operates in the production of Tic Douloureux in the facial nerve, namely, irritation of some portion of the chylopoietic viscera. Thus the various forms have been described as thoracic, epigastric, or intestinal, according to the seat of the pain. Women are more predisposed to this complaint than men; and it has been found to occur most frequently between the ages of fifteen and fifty. Of two hundred and forty-eight cases recorded by Griffin, twenty-six were males, forty-nine married women, and seventy-three girls. The most correct general idea of the phenomena presented by this affection may be conveyed by referring to the combination of symptoms occasionally presented by the different forms of hysteria, neuralgia, and chronic rheumatism.

The common exciting causes are uterine disorders, dyspepsia, worms, and other sources of irritation in the alimentary canal, affections of the liver, &c., all of which may be productive of sympathetic morbid actions in the nerves of the extremities.

The following circumstances, as observed by Griffin, will enable the practitioner to distinguish spinal irritation from organic disease: 1, The pain or disorder of any particular organ being altogether out of proportion to the constitutional disturbance; 2, The complaints, whatever they may be, being usually relieved by the recumbent posture, and always increased by lifting heavy weights, bending or twisting the spine, and, among the poorer classes, often consequent to the labour of carrying heavy loads; 3, The existence of tenderness in that part of the spine which corresponds with the suffering organ; 4, The disposition to a sudden transference of the disordered action from one organ to another, or the occurrence of hysterical symptoms in affections apparently acute.

It is of the utmost consequence to distinguish this affection from disease of the vertebral bones, an error of frequent occurrence, as there exists often an apparent prominence of the vertebræ where the tenderness is felt.

Dr. Bennet[1] has enumerated the distinguishing signs:

"In vertebral disease," he says, "the prominence is angular, and depends on displacement of the bones, or curvature; in spinal irritation, it is round, and is occasioned by slight swelling of the ligaments, or coverings of the spine. In diseased vertebra, there are seldom hysterical symptoms in young females; whereas they are common in spinal irritation. Disease of the vertebra is most common in young persons of a strumous constitution; spinal irritation, on the contrary, occurs most frequently in adults. Lastly, complete paralysis is common in vertebral disease; rare in spinal irritation; and, in the latter, the general health is not so much affected."

[1] See Art. "Spinal Irritation," in the Library of Medicine.

Practitioners who disregard these diagnostic signs occasionally commit sad havoc with the health of patients consigned to their care. I attended a young lady in whom spinal irritation had been for years mistaken for disease of the vertebræ, and who had undergone the most cruel treatment, not only without alleviation of the prominent symptoms, but to the enduring detriment of her general health. She subsequently experienced much benefit from the adoption of measures calculated to improve the wasted energies of her constitution.

HYSTERIA.

This disorder frequently occurs in females from gastro-intestinal irritation; and, from the same cause, affections simulating it sometimes arise in weak and irritable persons of the other sex. Neither one nor the other, however, can with strict propriety be denominated *hysteria*. The presence of worms has excited violent paroxysms,

resembling the hysterical, which have ceased with the removal of the irritating bodies that caused them. Improper food, depraved or deficient secretions, diminished peristaltic action of the intestines, and the consequent delay of the proper secretions, are known causes of symptoms common also to hysteria.

Upon what then do the essential symptoms of this affection depend—the wandering pains, the clavus, the hysteric trismus, and other general and local affections? I believe that the same causes which produce the neuralgiæ are in operation also to produce many of the phenomena of hysteria, and that the measures found to be effectual in one are of equal benefit in the treatment of the other.

SPASMODIC COUGH FROM ABDOMINAL IRRITATION.

In the Medical Gazette of December 6th, 1834, I published, under the title of "Cough arising from Diaphragmatic Spasm," the following case: when treading the footsteps of some of my medical brethren I committed the almost unpardonable solecism of attributing it to "Male Hysteria." Recalling, at this distant period, the circumstances to my memory, I have no hesitation in ascribing it to an immediate affection of the nerves of the diaphragm from abdominal irritation.

A young man, about twenty, of lax fibre, and lymphatic temperament, was seized with a peculiar kind of cough which at first occurred at rather long intervals, but at the time I saw him it could be produced by the least mental agitation or the mere exercise of volition. It consisted of a series of rapid expirations, in producing which the

larynx and glottis appeared almost passive, as the expirations were effected freely and without the characteristic hard or abrupt sound attending the alternate contraction and dilatation of the rima glottidis.

The upper part of the body, during the paroxysm, was not materially affected, and the disorder seemed to be produced solely by the spasmodic contraction of the diaphragmatic and abdominal muscles. During sleep an intermission occurred. There was no dyspnœa, and no expectoration indicating disordered function of the air-passages. The patient was much harassed by the excessive frequency of the convulsive action, and referred to the region of the diaphragm as the seat of his malady. The case had encountered a variety of treatment, but, as it was not under my care, I do not know the result of any particular method which may have been subsequently adopted.

AMAUROSIS.

It is a well-established fact that mechanical injury of the ophthalmic branch of the fifth will produce defective vision; that nerve consequently exerts an important influence on this function. The great sympathetic, it will be remembered, joins the first or ophthalmic division of the fifth, and also the vidian branch of the same nerve; any irritation therefore communicated from one seat to the other will produce its special effects.

Dr. Copland, in his splendid work now in course of publication,[1] states, that "Four cases of Amaurosis from lesion of the branches of the fifth have come before me in private practice: this disorder in some instances is *complicated* with facial neuralgia."

[1] Dict. of Practical Medicine, by James Copland, M.D. F.R.S. —Art. Amaurosis.

Mr. Travers also says, "There is an intermittent spasmodic pain accompanying some cases of Amaurosis, shooting through the orbit into the head, of the most acute and distressing severity; it makes a periodic attack at or about the same hour every night, and continues for several hours; it is accompanied with convulsive quivering of the muscles of the eye and eyelid, and profuse lacrymation; there is nothing in the appearance of the organ to explain its nature and origin. I believe it is Tic Douloureux affecting one or more of the branches of the fifth pair of nerves."

This form of Amaurosis arises either from disordered state of the digestive functions, a worm in the intestines, and other irritating matters in the alimentary canal, or is caused by local injury. The first is produced by communicated irritation directly applied to the ganglionic nerves of the abdomen, and will frequently yield to the same treatment as that recommended for Tic Douloureux; viz. purgatives, and the subsequent exhibition of tonic medicines.

EPILEPSY.

Whilst these pages were passing through the press I was favoured with the *Edinburgh Monthly Journal of Medical Science*, edited by Dr. Cormack; in No. VII. of which I observed an article on the "Efficacy of Croton Oil in Nervous Disorders," from the pen of Mr. Cochrane of Edinburgh.

I subjoin one of the cases, as it fully confirms the preconceived view I had entertained (from the known efficiency of the agent in allied affections) of the action of Croton Oil on an epileptic patient.

"Some time ago I was called to attend a man aged about thirty, of a very strong and robust constitution. When I first saw him he was outrageous and could not easily be managed by four strong individuals. His gestures, deportment, and violence were such as would have induced

many practitioners to have had recourse at once to a strait-waistcoat, but to me they occasioned little alarm, as I knew well the certainty of my remedial agent speedily producing an effect at once useful to the patient and gratifying to those around him. I prescribed as follows:

℞ Olei Tiglii, ♏ x.
Mucil. Acaciæ,
Syr. simp. āā ℥j. M.
Cap. Cochl. Min. omni quadrante horæ.

Half an hour had scarcely elapsed when he became quiet; and, at the end of the hour, he had so far recovered as to be able to sit up in bed and give rational replies to every question; whereas before the exhibition of the medicine he could scarcely articulate one word distinctly. He ultimately so far recovered as to be able to follow his usual employment as a house painter.

NEURALGIA PEDIS.

June 16, 1841. Mrs. S., 6, Rupert Street, Haymarket, had, when she consulted me, been, for several weeks, suffering from a neuralgic affection commencing with the great toe of the right foot and darting from that point to the inner ancle; whence it shot up the leg to the knee. Her nights were rendered sleepless by the excessive pain. There was an alternating neuralgic affection of the thoracic parietes (Gastralgia), at times so violent as to impart the sensation of impending suffocation. Her bowels were tolerably regular. She was unable to take the slightest exercise without inducing a paroxysm. She had tried a variety of topical applications both sedative and stimulating (in the enumeration of which "Brandy and Salt" formed an important item), without benefit.

℞ Pil. Rhæi comp. ʒ j.
Ol. Tiglii ♏ j.

Misce accuratissimè, et div. in pil. xij æqual. Cap. j nocte maneque. cum Cochl. mag. Mist. sequentis—

℞ Infus. Valerianæ ℥ vj
Tinct. Colchici ʒ ss
Sp. Ammon. comp. ʒ ij. M.

In a few days, she experienced decided relief, and by perseverence in the prescribed rules, at this period (July 10), passes undisturbed nights and is almost free from pain.

CASES

OF

TIC DOULOUREUX,

OR

NEURALGIA FACIALIS.

CASES OF TIC DOULOUREUX.

CASE I.

Mr. John Prowse, a respectable yeoman, residing at Long Wittenham, Berkshire, applied to me under the following circumstances. For nearly twelve months, he had been suffering the severest agony in the left side of the face. At the first accession of the disorder, the paroxysms occurred regularly after he had grown warm in bed; and the pain (of a sharp and plunging character) at these periods was so intense that he was obliged to rise several times in the course of the night and press the affected cheek to the marble chimney-piece or some other cold body, until he obtained relief. At other times, it would come on instantaneously during dinner, or after exposure

to cold air. Subsequently, it had assumed an intermittent character, being confined principally to the ophthalmic division or first branch of the fifth, which ramifies upon the forehead, and to the third branch supplying the inferior maxilla; and it occasionally extended also down the neck. The teeth were sound. A slight degree of permanent redness and swelling existed over the temporal region and superciliary ridge, to which parts leeches had been applied, and a blistering lotion, with no other than transient alleviation.

For a long period previously (nearly twelve months) he had suffered *intense, lancinating pains, in the right hypochondrium, but they entirely disappeared upon the accession of the facial neuralgia.*

This patient was immediately placed upon restricted diet and the purgative plan of treatment; and the Ol. Tiglii directed to be taken in small doses night and morning.

In three days, he called upon me again. The medicine had acted well upon the bowels, and there was a decided diminution of pain, which,

instead of recurring at stated periods, namely twice daily, with certain nocturnal exacerbations, had occurred twice only and in a very slight degree since his last visit:

Continuentur remedia.

I saw him again after an interval of a week, when he informed me, with strong expressions of delight, that since his last visit, he had experienced scarcely a twinge of his old malady. As, however, he manifested other symptoms of nervous derangement, I prescribed some tonic powders composed of the sesquioxyd of iron and quina.

I consider the foregoing case as confirming, in a peculiar manner, the views I have taken of the cause and seat of Tic Douloureux. It will be observed that this patient, in the first instance, laboured under a painful disorder of the liver, which, I should state, was not inflammatory, as it had for a long period resisted all attempts at removal by antiphlogistic measures. It moreover was benefited by moderate exercise; pressure afforded relief; and its functions were not much

impaired. It was in fact hepatalgia. Here then we arrive at something tangible, a datum whereon to ground pathological opinion; for, by a direct and sudden metastasis, the pain became transferred, through the agency of the ganglionic system, to a distant spot, a situation which anatomy has proved to bear a direct relation with the seat of the primary disease.

NOTE.—April 6th, 1840. This gentleman, who was much addicted to the sports of the field, had, after free living and imprudent exposure to cold and damp, another attack, which was sudden, and allowed a twelvemonth's interval of perfect ease. Previously to visiting me, he had applied veratria ointment, which aggravated the pain and extended it over the whole of right side of the head, producing Hemicrania. The attacks were now exceedingly violent, and again rendered his nights sleepless.

He was directed to use the same measures as heretofore employed. In a short time, he became convalescent; and, from that period until the present, has remained free from the disorder.

CASE II.

April 9th, 1840. Miss Elizabeth Harris, daughter of John Harris, Esq., late mayor of the borough of Abingdon, had, since November, been affected with facial neuralgia, with scarcely any intermissions of pain. She had previously been subject to hepatic derangement, with acute suffering (hepatalgia), and neuralgic pains in the parietes of the thorax which *alternated* with the affection of the face. A tooth was drawn, by direction of her medical attendant, without affording relief. She had taken iodine, mineral acids, and tonics (steel), which increased her suffering, as well as large doses of opium and other narcotics. Her health was exceedingly delicate, and she was subject to paroxysms of hysteria. The last physician whom she had consulted pronounced the case as almost hopeless.

She was immediately ordered gentle doses of the croton oil, which were alternated, as occasion required, with tonics and sedatives at bed-time, and strict injunctions given her with regard to diet, exercise, &c. In a few weeks, I received a note from Mr. William Smith, chemist of Abingdon, from which I make the following extract:

"Miss Elizabeth Harris has felt less pain since she commenced with aperient medicine; and, until to-day, since Saturday last, has been able to discard opiates. Her bowels have been pretty regularly acted upon, and she has had good nights, and upon the whole has made strength."

"Abingdon, May, 1840.

"DR. ALLNATT."

I lost sight of this patient soon afterwards, as she married, and settled in another part of the country. The effect, however, of the first doses of the medicine was to produce a marked alleviation of her suffering.

CASE III.

Robert Clarke, Esq., a gentleman, residing at Parmoor, Buckinghamshire, had been affected with Tic Douloureux for a fortnight. The pain was constant and intense, and at times the muscles of the neck were affected with such violent spasmodic action, that his face was jerked forcibly round towards his shoulder. The seat of pain was in the supra-orbital branch of the fifth and in the inferior maxillary. This gentleman was of a robust constitution, much given to athletic sports, and leading a free and irregular life. There was no decided evidence of hepatic derangement.

He was freely purged with ol. tiglii, and took the following draughts thrice daily:

℞. Infus. Valerianæ, ℥ iss.
Sp. Ammon. comp. ♏ xx. M.

At the expiration of three days, this patient was perfectly cured; and from that period to the present (nearly two years), has not suffered a relapse.

This is a case fairly illustrating the virtues of croton oil, as it was given uncombined with external applications. The combination of valerian and ammonia, I find exceedingly useful in allaying the disagreeable sensations which occasionally arise from the internal exhibition of the oil. In many instances, however, this precaution is unnecessary, as the remedy will be borne without inconvenience by the most delicate patient.

CASE IV.

Mrs. Bissle, Long Wittenham, Berkshire, æt. twenty-six, had Tic Douloureux of great severity, of nine months' duration. The face and head were affected with violent paroxysms which *alternated with pain in the right hypochondrium.* The general health was not greatly impaired owing to a naturally robust constitution.

She was put exclusively upon the purgative system. Croton oil, in small divided doses, com-

bined with compound rhubarb pill, was administered with the happiest effect. In the course of a week, she was completely cured.

NOTE.—At a subsequent period, this patient became the subject of an anomalous nervous affection, with flying pains in her limbs, severe headach, and sudden prostrations of strength. She speedily recovered under the use of gentle doses of the croton oil.

CASE V.

Mrs. Fox, æt. sixty-eight, of Wootton-under-Edge, Gloucestershire, had suffered from Tic Douloureux, in its most violent form, during eight years; had been subjected to a variety of medical treatment, and had been dismissed from the Gloucester infirmary as incurable. All the ramifications of the trifacial were affected; the lower and upper jaw, cheeks, forehead, and tongue. During a paroxysm, her face was thrown into contortions; and hard knots were formed in the

course of the nerve; tears flowed abundantly, and saliva issued from her mouth. Altogether she presented a pitiable spectacle. There existed mechanical injury to the nerves of the lower jaw, as she had suffered from necrosis, and subsequent exfoliation of bone. There was *acute pain in the right hypochondrium, alternating with the facial neuralgia.*

I despaired of making a perfect cure of this patient, owing to the great length of time the disorder had subsisted, and the local injury the nerves had sustained. By strict attention, however, to the state of the bowels, restricted diet, and the exhibition of gentle doses of croton oil, alternated or combined with sedatives and tonics, she was restored to comparative comfort, was enabled to attend to the duties of her household, and she assured me, with the liveliest emotions of gratitude, that she passed her nights almost undisturbed, and with much refreshing sleep, circumstances which had not occurred for several years previously.

A communication, from which the following is an extract, and Cases VI. and VII., were kindly transmitted by a medical friend and relative:

"WALLINGFORD; July 12th, 1841.

"MY DEAR FRIEND,

"The following cases have occurred in my practice within the last twelve months. I believe the plan of treatment has been very like that which you advocate. Believe me,

"Yours very sincerely,

"J. H. MARSHALL.

"R. H. ALLNATT, M.D."

CASE VI.

"Last summer, I was desired to visit Miss B., æt. twenty-two. During the previous year and a half, she had suffered severe and repeated attacks of facial neuralgia. The left supra-orbital nerve, and the temporal branch of the portio dura of the same side were the nerves chiefly affected. She

had been under medical care for more than twelve months. Leeches had been applied, and large doses of carbonate of iron administered without affording any decided relief. Blistering and quinine had been employed with no better result. The teeth were sound, the tongue was covered with a brown coat, the bowels were torpid, the skin was hot, and the pulse small and frequent. I gave her, night and morning, three grains of aloes, one of gamboge, with a quarter of a drop of croton oil, and this was continued for a week. A large collection of fæcal matter was evacuated. On the third day after commencing with the pills, she was easier than she had been for a long time, and her sufferings, from this period, daily diminished. At the end of a week, I gave the mist. ferri comp. twice daily, occasionally employing the pill at bed-time. In a month, she was quite well, and has not had a return of the disease."

CASE VII.

(COMMUNICATED BY J. H. MARSHALL, ESQ.)

"A fortnight since I was requested to visit Mr. G., aged forty, who for three nights and days had been suffering intense agony from Tic Douloureux. The pain traversed all the ramifications of the trifacial nerve, and alternately affected both sides of the face.

"The paroxysms came on at intervals of about an hour. His countenance was sallow, tongue thickly covered with a dark brown coat, pulse small and frequent. His bowels were confined, and the perspiration poured down in streams during the attacks.

"I gave him three grains of aloes, two grains of gamboge with half a drop of Short's croton oil, twice a day. Finding, after twenty-four hours, that but little effect had been produced, and no mitigation of the suffering, I increased the dose of croton oil to one drop in each pill. On my

next visit he informed me that the bowels had acted more than twenty times, that he was almost free from pain and had slept all night, except when disturbed by the operation of the medicine. The dejections were scybalous, and very fetid.

"He continued the pills, taking one only each morning, for two days longer; at which time, finding his pains entirely gone, I ordered two grains of quinine three times a day. This had the desired effect; he rapidly improved, and is now able to follow his usual avocations."

NOTE.—Although no mention is made in the last two Cases of epigastric or hepatic *neuralgia*, they disclose abundant evidence of functional derangement of the liver and bowels.

Case VI. also confirms my position regarding the utter inutility of topical applications and powerful tonics, administered during the persistence of the *fons et origo malis*, as it will be perceived that the patient had been under medical treatment for nearly a year and a half, and had been leeched and blistered, and treated with

steel and quinine, without deriving the smallest benefit.

Intrinsically valuable as these cases are, to me they come with double force as corroborative, in every essential particular, of the views I have maintained, and as they emanate from a gentleman who was previously unacquainted with the ideas I had formed of the proximate cause of facial neuralgia.

I have other cases recorded; but I deem it unnecessary to swell the present list, as they all tend to confirm the opinion I have maintained of the origin of Tic Douloureux, and the efficacy of the treatment adopted. In no solitary instance have my expectations been disappointed, where the patient has strictly adhered to the rules prescribed; and I cannot, in conclusion, too strongly urge upon the notice of medical practitioners the necessity which exists of *examining minutely into*

the condition of the chylopoietic viscera in all cases of neuralgia in whatever part of the body situated, and of directing their best efforts to the primary removal of the proximate cause; being firmly persuaded, that by temporizing with this fearful malady by the employment of topical applications, much valuable opportunity is wasted and grievous disappointments daily incurred; while, by the indiscriminate use of tonics and powerful narcotics, incalculable injury is inflicted upon a frame already enfeebled by protracted suffering.

I am not aware whether or not my experience coincides with that of other practitioners, but I have found Tic Douloureux, when occurring in females, much more intractable than in the other sex. It is frequently complicated with hysteria, spinal neuralgia, or one or other of the *neuroses fœmininæ*, and is almost invariably accompanied with greater susceptibility of constitution to moral and physical impressions; circumstances which render necessary the use of much caution in the employment of means, dietetic and medicinal.

One word with regard to croton oil, the use of which I have so repeatedly recommended. I look upon it as something more than the most valuable *purgative* we can employ in painful nervous affections: it exerts a powerful, nay almost *specific*, influence over the majority of cases, and frequently effects a cure without the aid of other remedial measures.[1]

Its powerful agency was discovered by Sir Charles Bell, in a violent case of Tic Douloureux which occurred at the Middlesex Hospital, and was detailed by him in the Medical Gazette, about seven years ago. Since that time, I have employed it largely, and can bear testimony to the justness of the eulogium bestowed upon it. At a future period, I hope to be enabled to

[1] It is, of course, of great importance that the genuine expressed oil of the seeds of croton tiglium be used; as a violently cathartic, acrimonious substance is manufactured and frequently sold for croton oil, procured from the seeds of jatropha curcas, &c. I deem it, therefore, of consequence to the public, and an act of justice to an individual with whom I am personally unacquainted, to state my conviction that the medicine prepared by Mr. Arthur Short, of Moorfields, is perfectly genuine: I have employed it in many cases, and with the most satisfactory results.

submit to the notice of my medical brethren additional examples of its efficacy in various allied disorders. For the present, I rest satisfied with having cursorily directed their attention to its beneficial employment in a few of these forms, and more particularly in a malady which by many has been incorrectly deemed incurable.

APPENDIX.

APPENDIX.

Account of a case of Supraorbital Neuralgia, cured by dividing and subsequently cauterizing the Nerve, with Physico-pathological Remarks. By Carlo Francesco Bellingeri, Physician to his Majesty the King of Sardinia; President of the Faculty of Medicine in the Royal University of the Great Hospital of the Equestrian Order of St. Maurice and St. Lazarus; Corresponding Fellow of the Medico-chirurgical Academies of St. Petersburg, Brussels, Naples, Padua, Siena, Bologna, &c. (Extracted from the Transactions of the Medico-chirurgical Society of Bologna, Vol. ix. p. 246.)

The advocate P. G. G., of Dronero, aged 26, of sanguine and nervous temperament, and of weak habit of body, received, in the year 1810, when eight years of age, a wound about a finger's breadth above the superciliary foramen, on the left side. It was caused by a long and thick piece of iron, which fell on him as he lay horizontally, and struck him with its blunt extremity.

It caused contusion and laceration, which produced a copious hemorrhage of about two pounds, and was followed by a slight syncope. Soon afterwards, the wound became cicatrized, and, for the next six months, he suffered no inconvenience, either locally, or in his vision. After about that period, he became subject to sensations of weight and uneasiness in the whole of the left frontal region, accompanied by a slight sense of pulsation in the place of the cicatrix. At the same time, the left eye was unable to bear the light; he was obliged to keep the eyelids closed; his vision was impeded and confused; aud, when he attempted to read with that eye, tears soon followed. If at such times he took food, the evil was increased, and prolonged a good deal more than usual. These symptoms manifested themselves on awaking in the morning, and generally lasted twenty-four hours; but, if they did not disappear at that time, they lasted till the third day.

Such periodical attacks, indicating, in my opinion, a frontal neuralgia, were characterized by a simple hemicrania: they returned almost

regularly every month, and went away spontaneously; no method of treatment having been adopted. They continued thus till the year 1823; and, in the mean time, the patient suffered no additional inconvenience except constipation, with the alvine dejections loose, scanty, and with scybala: this, however, was not hemorrhoidal.

In the month of March 1823, the pains in the left superciliary nerve were so intense that blood-letting was employed fourteen times in a fortnight; but the pains, notwithstanding, continued more or less acute for about three months. During the accesses, the frontal artery appeared rather turgid, and pulsated with great force. After this time, the pains returned with intensity every month, but departed in two days, of their own accord. In December of the same year, the frontal neuralgic pains were reproduced, and they extended themselves also to the left temporal region, and were accompanied by a remarkable increase in volume, and vehement pulsation of the temporal and frontal arteries. The disease was supposed to be an angiotitis, and phlebotomy

was employed ten times: this treatment produced a degree of calm, but did not entirely remove the evil. He repaired to Padua in March 1824, where arteriotomy in the temple was recommended, but not put into effect. He used, without effect, cherry-laurel water internally, and applied to the seat of pain. Narcotic extracts of every kind were used, externally and internally, but with little advantage.

From this period till 1828, every month, and especially towards the end, he was assailed by these neuralgic pains, which nothing succeeded in removing, and which were decisively alleviated only by general bleeding, and by the application of leeches to the head; operations which, if performed on the first appearance of the pains, brought to the patient a more prompt and manifest relief, and, if repeated several times, he remained for a longer period free from these, the intervals of the attacks extending themselves to two or even three months.

In the course of these years, he made the following observation, namely, that the hair of

the left side of the head was rougher, harder and thicker than on the right side; besides that it grew long on the left side much sooner than on the right, so that there was a remarkable difference in the length of the hair on the two sides of the head.

In April 1828, he was visited by me, in conjunction with Professors Geri and Riberi, and we observed that pressure on the frontal nerve, at the point where it issues from the superciliary foramen, gave pain; and that the whole frontal and temporal regions, on the left, exhibited a greater development, and were more turgid than on the right side, and this had been the case for some years: the state of the eye and pupil was uninjured, as well as vision, on that side: the sense of touch was in its natural state in the frontal and temporal region as well as in all the parts of the head covered with hair: the motions of the orbicular, superciliary and frontal muscles of the left side were free in every respect.

Having considered the cause, development, course, and symptoms of the disease, we agreed in

opinion that it was a traumatic frontal neuralgia, the essence of which was to be regarded as depending on a slow phlogosis of the nerve, accompanied also perhaps by some organic alteration of the nerve itself; for the cure of which, in our opinion, nothing else was required but the cutting of the supra-orbital nerve, and its subsequent cauterization.

The incision was accomplished on the 10th of April by the distinguished Professor Riberi, in in which operation, however, I assisted. The cutting of the nerve, which was accompanied by a good deal of pain, was made about two lines above the superciliary foramen, and under the place of the old cicatrix. In the act of cutting this nervous branch, the patient felt a sensation as it were of shaking in the whole interior of the head. The attendant hemorrhage was about two ounces. We convinced ourselves that we had really cut the nerve, since, before the cutting, it had been exposed; and, after the cutting, we saw the two white extremities of the incised nerve. On taking up with pincers the lower extremity of the cut nerve, namely, that towards the origin of

the nerve, the pain was very acute.[1] After a short time, both extremities of the cut nerve were cauterized with a red-hot iron, and this was done twice successively. The patient suffered very intense pain, particularly the second time, and then accompanied by a sensation of flame, which extended itself upwards along all the ramifications of the nerve, and by a general sensation of shaking in the brain, which produced cries, agitation, and universal spasms, and these were followed by a slight leipothymia, and by cold sweats: the whole disappeared in the space of two minutes.

In the following days, fever was developed, with pains in the head, and in the place of the wound, whence bloodletting was employed three times, and local leeching to check the topical inflammation, and to prevent that of the brain. He had a vibrating pulse, and cherry-laurel water was administered internally in doses of ten drops a day in an emulsion of gum arabic.

The fifth day after the operation, he had general

[1] This does not prove it to be a nerve of touch.—R. H. A.

spasms in the night, but without loss of consciousness, as he had already suffered on other occasions.

The seventh day after the incision, we proposed to examine the wound attentively; and, for this purpose, it was necessary to dry the bottom of it, which was moistened with serum. With this view, Professor Riberi introduced cotton fibres, with pincers which were a little oxydated at their extremity. The application of the fibres produced no sensation; but when the two points of the pincers came in contact with the extremities of the incised nerve, the pain was most acute; the patient felt as if fire were propagated through all the superior ramifications of the nerve, and a shaking in the whole brain, which he felt principally about the end of the medulla oblongata, that is, near the origin of the fifth pair: the patient said his brain felt as if it were going away. He experienced tremor and general agitation, and some attempt at vomiting; and when drink was offered to him, he could not swallow it. This sensation was much more painful than the caute-

rization itself, and appeared analogous to a very strong electric shock, probably produced by the contact of the oxydated part of the iron with the serum existing in the wound, and with the two cut extremities of the nerve, elements which, perhaps, served as instruments for developing electricity. These phenomena afforded to us additional evidence that the nerve had really been cut.

In the first days after the cutting, he felt nothing more than a slight formication in the hairy part of the head. On the twentieth day, the wound was almost entirely cicatrized, the patient rose from his bed, and two days afterwards, being out of bed, he had palpitations of the heart, which extended as far as the bifurcation of the left carotid and no farther, and were attributed merely to the weakness, in which the individual was at the time.

On the twentieth day after the operation, the patient found himself perfectly re-established; for a long time afterwards, he felt no troublesome sensation in any part of the left side of the head;

he had no more pulsations in the forehead or temples; all the left side of the head had acquired its natural volume as on the right side; that is, the greater development and turgidity, which had before the cutting been observed, disappeared; the eye-ball was perfectly sound, and vision was wholly unimpaired in both eyes. The left superciliary nerve also, when pressed, no longer produced any disagreeable sensation. The sense of touch was examined in the whole extent of the left side of the head; and at every point that sense was in a natural state, and of exactly the same degree as on the right side. The patient, on being slightly vellicated in the forehead and the left temporal region, felt a tickling which disposed him to laughter; he perceived the different sensations of temperature; and felt the different impressions which are produced by touching or slightly pulling the hair.

The motions of the frontal and superciliary muscles, and the orbicular muscle of the eyelids, and also the occipital, were quite free as before the cutting, and entirely analogous to the motions

executed by the same muscles on the right side of the head. This favorable state continuing, he returned home as cured.

On the 12th of the following month of June, he had an intense cephalalgia in the right temporal region, accompanied by fever. For this, blood was twice taken, and it appeared very red, and without any film: the pains of the right side of the head were thus subdued the same day. The following morning, he awoke affected with analogous pains in the left temporal region, feeling a pulsation in the frontal region, the seat of the old neuralgia: leeches were therefore applied behind the ears, and thus all pains in the head disappeared.

A few days afterwards, he was attacked with general spasmodic affections, sometimes in the form of direct tetanus; and sometimes the extremities, superior as well as inferior, were rigid in the state of extension, or spasmodically bent. In the course of these convulsive attacks, sometimes the intellectual faculties were unimpaired, and sometimes there was loss of understanding. The

attacks lasted from a quarter of an hour to an hour, and were repeated for fifteen days. All this was attributed to a disturbance of the nervous system, and as the described attacks observed an irregular periodical return, they were removed by the use of acetate of morphine, at first alone, and afterwards combined with sulphate of quinine. His health was thus re-established, and remained good till the end of September, when he was attacked by enteritis, which was cured by the antiphlogistic method.

At the close of June 1829, he was again visited by me, and informed me that he was no longer subject to the before-mentioned neuralgic pains in the face; he no longer felt pain on pressure of the superciliary nerve; the sense of touch was quite natural in the whole left region of the head; the motions of the muscles in the frontal and left temporal region were in every respect free; the hair of the left side of the head had acquired its original softness, and no longer grew with extraordinary rapidity, but equally with that of the right side. He no longer felt any inconvenience;

the state of his digestion was excellent; and he remained perfectly cured, six years having now elapsed without any interruption of his health.

PHYSICO-PATHOLOGICAL OBSERVATIONS ON THIS CASE.

The deduction which seems, at first view, to follow from this case is, that the supraorbital branch, which is a subdivision of the fifth or trifacial pair of nerves, does not at all serve, either for motion or touch, in the skin which covers the forehead, temples, crown of the head and occiput, those parts in the cutaneous tissue of which are distributed the ultimate ramifications of the supraorbital branch, as the frontalis superficialis, which gives its filaments to the skin in the frontal and temporal region, and also the frontalis profundus, whose filaments supply with nerves the skin on the forehead, occiput, and crown of the head. Indeed, the supraorbital branch having been decidedly cut, and the motions of the orbi-

cular muscles of the eyelids, and of the frontal and superciliar muscles, having been preserved without injury, and, moreover, as there existed the most exquisite and natural sense of touch in the whole left side of the head, on the forehead, temples, occiput and crown of the head, as well immediately as long after the operation, it seems natural to conclude that the supraorbital branch, a subdivision of the fifth pair, not only does not serve for voluntary motions, but not even for sensation, and for governing the sense of touch, and that, therefore, there are branches of the fifth pair which are not destined for sensation and touch, and consequently that the fifth pair does not uniformly govern sensation.

Such was the conclusion which I, conjointly with Professor Riberi, drew at first, there being no room whatever to doubt of the complete cutting across of the supraorbital branch. For a long time, I remained of that opinion, namely, that the sense of touch in the frontal, temporal, vertical, and occipital region was not directed by the branches of the fifth pair, but certainly by

the seventh pair, of which the deep external branch gives filaments to the skin in the occipital region; and the temporal branch, which is a division of the temporo-facial, gives filaments to the skin in the temporal region.

However, to my holding this opinion were opposed the numerous and uniformly resulting experiments of Charles Bell, Magendie, Mayo, Eschricht, who demonstrated that the cutting of the trunk or branches of the fifth pair induces total insensibility, the motions remaining free, while the cutting of the facial nerve produces paralysis as far as regards motion, leaving sensation uninjured. My view was further opposed by the two pathological cases published by me in the year 1818,[1] one of a morbid affection of the trunk of the fifth pair, and the other of the seventh or facial nerve. In the first, there was anesthesia in all that side of the face; and, in the second, there was only paralysis as far as regards motion in almost all the muscles in the

[1] See my Dissertatio Inauguralis, Part III., Ex physiologia: Quinti et septimi nervorum pares functiones; pages 125 and 181.

corresponding side of the face, the sense of touch remaining natural; and thus, from these two cases, the distinct functions of these two nerves were rendered clear, and that long before Charles Bell published his papers, which he did not do for three years after, namely, in 1821. And I am much surprised that Bell did not quote my opinion either then, at a time when he already ought to have known those works of mine, as they had been presented to the Royal Society of London in 1820; or even in his last Memoir, in 1829, although my priority had been claimed and demonstrated.[1]

To conclude this long digression, and return to the subject of the deductions which might be drawn from the present case, I was diverted from attributing the continuance of the sense of touch in its natural state to the ramifications of the facial nerve, not only by the reasons before detailed, but by reflecting that but few of the filaments of the seventh pair are distributed to

[1] See Omodei's Annali Universali di Medicina, vol. xli. p. 241.

the skin of the cranium; and that these go neither to the crown of the head nor to the forehead, but are strictly limited to the temples and occiput.

I reflected further, that other ramifications of the fifth pair, besides the before-mentioned branches of supraorbital, are distributed to the skin of the frontal, temporal, vertical, and occipital region, such as an offset from the supertroclear branch, called the medio-frontal nerve, which gives filaments to the skin of the forehead; and the supratroclear is a division of the frontal nerve, and this comes from the ophthalmic, the first branch of the fifth pair. Besides the medio-frontal of the supratroclear, another ramification of the supratroclear, called the superior frontal branch, is distributed in the skin of the forehead and vertex. Further, there is also distributed in the skin of the forehead a branch of the infratroclear, called the palpebro-frontal; and the infratroclear is a shoot from the nasal nerve coming from the frontal, and these from the ophthalmic of the fifth pair. Moreover, in the skin of the fore-

head and vertex, are distributed the filaments of the subcutaneous temporal, an offshoot from the subcutaneous of the cheek, as the latter is from the superior maxillary branch of the fifth pair. Finally, the skin of the forehead, vertex, and occiput, receives filaments of the temporal proper, which is an offshoot from the cutaneous temporal, and the latter is a branch of the inferior maxillary of the fifth pair.[1] Moreover, the occiput receives filaments from the second and third pairs of cervical nerves. So that it is evident that nature has been liberal in providing with nerves of sensation the skin which covers the cranium, and these coming from different ramifications of the same nerve, or from distinct nerves and pairs.

Reflecting, therefore, on the great number of nervous ramifications which, besides those of the

[1] As to the above-mentioned ramifications and distributions of the fifth and seventh pairs, consult Mekel's Traité des Nerfs de la Face. In the Mémoires de l'Académie de Berlin, vol. vii., and Collection Académique, partie étrangère, vol. viii.; and especially the Synoptical Tables of those nerves given in my Dissertatio Inauguralis.

supraorbital, go to the skin on the frontal, temporal, vertical, and occipital regions; considering that, after the cutting of the supraorbital branch, the touch remained uninjured in all these places; it is not allowable to conclude that the supra-orbital branch does not serve for touch: hence it would have been a false general conclusion that the fifth pair is not destined for touch, and still more erroneous to attribute touch to the seventh pair, while in our case, the sense of touch might be produced by the other numerous ramifications above mentioned of the fifth pair; and which, besides the supraorbital, go to the skin in those regions of the head.

The only deduction which may rigorously be drawn from this case is, that, after a sentient nerve has been cut, the sense of touch is not destroyed or injured, when the part is provided with other considerable sentient nerves.

Neither could the conclusion be drawn, that the supra-orbital nerve does not serve for the motions of the frontal and superciliar muscles, and the orbicular muscle of the eyelids; since

these muscles receive also many filaments of the supra- and infra-troclear, and of the subcutaneous temporal, which are branches of the fifth pair, besides the ramifications of the seventh pair, or facial nerve; since this argument goes to prove that, if the supraorbital branch were a nerve of motion, it might be cut without impairing the motion; and, since many other nervous branches of the fifth pair go to those frontal, superciliar, and orbicular palpebral muscles.

Charles Bell, however, makes use of a similar fact to prove that the supraorbital branch does not serve for motion. He writes that "Superciliary paralysis did not take place in the case of a man whose frontal nerve of the fifth pair he had cut, to cure him of a Tic Douloureux."[1] I believe that Charles Bell meant the supraorbital branch, since such an operation would not be performed as cutting the frontal nerve before its division into the supratroclear and supraorbital branches, which takes place at the base of

[1] See Omodei's Annali Universali di Medicina, vol. xxvii. p. 110.

the orbit, or even before the frontal enters the orbit, a place in which the frontal nerve would not be cut. Assuming, then, that Charles Bell cut the supraorbital branch, has he observed one part of the phenomena seen by me, namely, that paralysis, as regards motion, did not supervene? But I add, that there was not even anesthesia; and I believe that Charles Bell saw the same thing, but suppressed all mention of it, because such a fact would be opposed to his hypothesis. His undertaking was to demonstrate that the supraorbital branch, like the other branches of the fifth pair, was sentient and not motive; he proved by this fact that it was not motive; but it does not absolutely follow that it is sentient; the presence of anesthesia was required to show the supraorbital branch to be sentient. Now, after its cutting, there was not anesthesia, and the author is silent on this part of the phenomena, because the fact contradicted his hypothesis.

I content myself with adducing the fact; and I say, that cutting entirely through the supra-orbital branch brought on neither paralysis nor

anesthesia; and from this I now draw only the pathological consequence, that such a cutting may be made without any injury either to the touch or to motion.

To conclude, then, whether this branch is sentient or motive, this fact ought to be compared with the results of experiments and pathological observations of other branches of the fifth pair. Relying solely on the experiments made on brutes, all physiologists agree in saying that the cutting of the other branches of the fifth pair (I mean always its greater portion, and not the smaller one, which has been called by me the masticatory nerve) induces anesthesia and not paralysis; so it seems by analogy that, according to the results of such experiments, it ought to be concluded, that the supraorbital branch likewise presides over touch, and not motion.

However, pathological observations are opposed to the results of such experiments; and first that related by me,[1] where, in a case of disease of the

[1] Dissertatio Inauguralis, part iii. p. 125.

fifth pair, there was diminution of the sense of touch, and paralysis as to motion, not indeed in the muscles serving for mastication, but in all the other muscles of the face. The anatomical observation made by Mayo, namely, that the fifth pair by itself is motive in the circumflex muscle of the palate,[1] confirms us in the idea that the greater portion of the fifth pair also has an influence on the motions of the face.

This opinion is still further corroborated, if we consider attentively the phenomena resulting from the cutting of some branch of the fifth pair, performed in a case of neuralgia; phenomena described by authors who are certainly impartial, since they wrote before the questions relative to the functions of the nerves of the face were agitated among physiologists.

Thus Haighton relates that he cut the right infraorbital branch in a lady affected with neuralgia. He says, "It is to be observed, that the sensation and motion of the lip, although evi-

[1] See Journal de Physiologie Expérimentale, vol. iii. p. 354.

dently diminished, were not entirely lost, as I had predicted; this symptom did not last long; and I think that a reunion of the nerves took place where they were divided, which has produced the great advantage that, up to the present time, no disposition towards a return of the disease has been manifested in the regenerated part.[1]

If, therefore, in this case, after the cutting of the infraorbital nerve of the fifth pair, the sensation and motion of the lip was injured, it indicates that the fifth pair had an influence on the sensation and motion of it; and, although motion and the sense of touch may have been afterwards re-established, it does not follow that that nerve does not preside over the functions mentioned, the restoration of which depended, as Haighton thought, on the reunion of the nerve.

A clearer case is that of Leydig, in which, for infraorbital neuralgia, the before-mentioned branch was cut; and after the incision the upper

[1] See London Medical Review and Magazine, and Halliday's Considérations Pratiques sur les Nevralgies de la Face, p. 55.

lip was in a state of torpor and insensibility, and it seemed to the patient that his lip was as big as a fist, although it was not at all swelled; it was, however, colder than the other parts of the face, and the right side of the lip was drawn towards the left; thus the neuralgia was cured. About two months after the cutting, a cicatrix having been already formed, it was observed that the right side of the nose and the upper lip on that side had lost their sensibility; and the patient felt that part of the lip colder, and it seemed to him more voluminous than before the cutting of the right infraorbital branch. Fifteen months after the cutting, there was still anesthesia of the upper lip, and of the left ala of the nose.[1]

It is a defect that, in the preceding case, it is not specified whether or not the traction of the right lip towards the left side, for fifteen months after the cutting, still remains.

It is therefore plain, from these two cases, that cutting of the infraorbital branch injures

[1] Leydig Doloris Faciei dissecto Infra-orbitali Nervo Historiæ; and see Halliday in the work quoted, p. 66.

the sense of touch and voluntary motion; inasmuch as, in the case related by Leydig, the right lip was pulled towards the left side, which phenomenon indicates that there was at least paresis in the muscles which move the right upper lip; and therefore these two cases render very doubtful the doctrine of Charles Bell, and of Magendie, with whom the two excellent authors cited would willingly establish that the fifth pair was only connected with sensation, and not motion, in the face.

Leydig's case confirms my doctrine, namely, that the fifth pair directs the organic functions in the face. Indeed, besides the anesthesia, there was, in the affected upper lip, that general sense called cenæsthesis; inasmuch as the patient felt that lip cold, as it actually was, and besides it seemed to him much more voluminous than natural.

Now, to return to our first case, if any one should wish to deduce from it, that the supra-orbital branch is neither motive nor sentient, but devoted to other functions, because, supposing it

to be a nerve of sensation, the incision ought to have induced at least a diminution in the sense of touch, I shall agree with him, that it may serve for sympathies and organic and instinctive functions in the parts in which it is distributed. But, since the cutting of that branch did not at all disconcert, but rather restored regularity to those functions, the same difficulty always arises, namely, how could the functions all be performed regularly, if any nerve had been cut which directs and supports them?

It is true that the case described by me proves the influence of the branches of the fifth pair on the organic functions, and particularly of the supraorbital branch; the latter formed the seat of the evil, and greater turgidity was visible in the forehead and left temple; and that turgidity continuing proves greater nutrition in that part, and increase in the property called vital turgidity: the hair too was rougher, thicker, more numerous and grew more quickly, on the left side than on the right; moreover during each neuralgic access, the temporal and frontal arteries became turgid and

pulsated with great force: circumstances all of which demonstrate that the morbid affection of the supraorbital nerve produced an increase in the exercise of the organic functions relative to nutrition, circulation, and vital turgidity; all of which disappeared after the cutting of the supraorbital nerve and the subsequent cessation of the neuralgia.

In my Inaugural Dissertation before quoted, it appears to me that I have already fully demonstrated that the fifth pair presides by itself over the organic functions. This proposition is further confirmed by the experiments of Magendie, who, having cut the trunk of the fifth pair in a rabbit, saw that the eye became dry, the iris was contracted and motionless, the cornea became opaque, and after a time white; the conjunctiva, red and inflamed, secreted a milky pus; the eyelids were covered with a dense pus; the iris became red, was inflamed, and became covered with a pseudo-membrane; the internal humours of the eye were turbid and opaque; the tongue became white only on that side on which the nerve was cut;

thus even the epidermis was thickened and the gums were drawn from the teeth.[1] Then it is plain, from the pathological case related by Serres, that after a disease of the trunk and ganglion of the fifth pair on the right side, there first came on a slight ophthalmia in the right eye which increased by degrees, hence the cornea became opaque, and scurvy appeared in both jaws, but only on the right side.[2] In the pathological case mentioned as inserted in my Inaugural Dissertation, among other phenomena, the one referrible to the organic functions was the disappearance of sympathy between the nasal branches and the lacrymal, and between the nasal and the phrenic; whence, on irritating the nostril on that side, there was neither an effusion of tears in the corresponding eye, nor was sneezing produced; phenomena which were obtained by similar irritation of the other nostril.

[1] See Journal de Physiologie Expérimentale, vol. iv. fasc. 2; and Omodei's Annali Universali di Medicina, vol. xxxii. p. 288.

[2] See Serres' Anatomie Comparée du Cerveau, vol. ii. p. 67; and Omodei's Annali Universali, vol. xxxiv. p. 297.

From all these facts, it appears clearly what influence is exercised by the nervus trigeminus on the organic functions in all the points of the face. Being well persuaded, with me, of this truth, the distinguished Professor Francesco Hildenbrand did not hesitate to enumerate that nerve among those of organic life.[1] This was properly done, since recent physiologists have not regarded the trigeminus nerve solely as devoted to animal sensibility, but also to presiding over the organic and instinctive functions, over organic sensibility or cenæsthesis, and over the sympathies, as I have fully demonstrated in my dissertation. This opinion has also been embraced by Stark, Professor at Jena.[2]

What has been said is sufficient as to physiological deduction. Then, as to the pathological, it is clear that the essence of the disease did not consist in a simple phlogosis, but certainly in an

[1] See Annales Schorlæ Clinicæ Medicæ Ticinensis, tom. ii. pp. 141 et 230.

[2] See Bulletin des Sciences Médicales, rédigé par M. de Fermont, *anno* 1824, tom. ii. p. 100.

organic alteration of the nervous branch affected. This might be produced *à priori* from the kind of lesion made by a weighty and bruising body, which had the effect not only of irritating the nerve, but at the same time of compressing and crushing it, and so injuring its texture. The long duration of the disease proved that it had lost the character of simple phlogosis; as this, by having become chronic, had necessarily produced some of the results peculiar to it in the nervous tissue, as thickening of the neurilema, serous effusion in it, or alteration of the nervous substance. There was therefore a true pathological condition, not removable merely by the method of compensation. In fact, the antiphlogistic treatment, continued briskly, diminished indeed the intensity of the attacks, rendered them less frequent, but was never able to effect a radical cure. This proves that the neuralgic accesses depended, in fact, on a greater phlogistic irritation of the nervous branch, produced by accidental causes, but that it did not constitute the whole essence of the disease, which principally arose from the organic lesion of the

nerve: and this fact proves that, speaking of a disease of the nervous system, there may be a permanent cause in it, without producing a permanent effect. This serves only as a predisposing cause; and the concurrence of other occasional external or internal causes, although slight, is required to cause the reproduction of the disease with its phenomena.[1] But it is nevertheless true that the pathological condition of a part of the nervous system, although it does not constitute the proximate cause of the disease, fixes however the principal therapeutic treatment, namely, the removal or distruction of it as far as that is possible.

This observation partly confirms what is already written in the books of Hippocrates: "Visus obscuratur in vulneribus incussis in supercilium et paullo altius;"[2] an observation already also made by Valsalva, by Monteggia, and by the distinguished Professor Turina,[3] namely, that

[1] To the attentive reader the separation of truth from error here will not be difficult.—R. H. A.

[2] Libro Coacarum Mem. 3. Apud Marinelli.

[3] See my Dissertatio Inauguralis, pp. 130 and 131.

lesions made in the supercilium sometimes induce blindness, dimness of sight, permanent dilatation or constriction of the pupil. In our case, in the beginning, the left eye could not bear the light; the sight was impeded and confused; and, attempting to read with the left eye alone, he soon shed tears. These phenomena are well explained by attending to the nervous anastomoses, and the issuing of the ciliar, lacrymal, and supraorbital nerves, from the same nervous branch, namely, from the ophthalmic.

As to treatment[1] the history of this case confirms the utility of cutting and subsequent cauterization of the nerve; to cure, at least, those cases of neuralgia which have their seat, not in the trunk indeed, but in some branch of the fifth pair; as we know that cutting was employed with decided advantage by Guerin, Haighton, Moreau, Jackson, Leydig, and many others. At the time I write, six years have elapsed since the cutting, and the patient has had no more attacks of neuralgia.

[1] The errors here involved will also be obvious.—R. H. A.

No paralysis in the muscles of the eyebrow having followed the cutting in this case, partly proves the correctness of what I had already said: "Neque a cæsione ramorum quinti paris sequitur paralysis musculorum faciei."[1] Whereas, speaking of the cutting of the branches of the facial nerve, I expressed myself thus: "Quod si diagnosi constitutum sit neuralgiam aggressam esse septimum par, numquam, meo quidem judicio, trunci, vel ramorum sectio est pertendenda . . . . . nec trunci, neque ramorum sectio est instituenda, necessario enim subsequeretur paralysis quoad motum voluntarium quamplurimorum musculorum faciei."[2] From which also I am astonished how Charles Bell has been believed to be the first to draw the practical conclusion, that the cutting of the superficial nervous branches, in Tic Douloureux, is not only useless, but sometimes followed by serious, and almost irremediable accidents; such as, distortion of the features, loss of the power of distinct articulation, immo-

[1] Dissertatio Inauguralis, p. 302. [2] Ibid.

bility in the eyelids, &c.[1] I should like, therefore, that, at least for the future, the English Charles Bell would state what is his own, which indeed is very good, but would also indicate what belongs to the Italian Charles Bellingeri, who published his views many years previously to his: "Onde desidererei, che, almeno in avvenire, l'Inglese *Carlo Bell* ed annunziasse ciò che è suo, che pure ha molto di buono, ed indicasse quello che spetto all' Italiano *Carlo Bellingeri*, che pubblicò il suo scritto molti anni prima de' suoi."[2]

Finally, this case proves that, besides cutting, it is good to cauterize the nerve, otherwise, if it is only cut, it may turn to a cicatrix, and the neuralgia thus be reproduced; unless, by a second cutting, a small part of the nerve itself be removed, and the extremities be thus prevented from uniting, and cicatrization promoted. And

[1] See Omodei, Annali Universali, vol. iii., p. *555*.

[2] The great frequency of these false impressions as to Sir Charles Bell's discoveries is not to the honour of recent scientific enquiry; and the gentle protest of Bellingeri in the preceding sentence indicates much good temper.—R. H. A.

this method of a second cutting would be far preferable to cauterization. The history of the case shows how painful cauterization is, and much more so than the cutting itself; therefore it would be better to make a second incision, to remove a small portion of the nerve; taking care, however, to make the second incision towards the extremity of the nerve, and not towards the brain; and this for the purpose of saving a repetition of the pain.

THE END.

PRINTED BY C. ADLARD, BARTHOLOMEW CLOSE.