Ruppaner (A.)

ON THE

TREATMENT OF NEURALGIA

BY

SUBCUTANEOUS INJECTION,

WITH CASES.

BY A. RUPPANER, A.M., M.D.

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[Re-printed from the Boston Medical and Surgical Journal.]

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BY A. BUFFANER, A.M., M.D.,

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SUBCUTANEOUS INJECTION IN NEURALGIA,

WITH CASES.

I PURPOSE to lay before the profession the detailed account of several cases of severe neuralgia, under my care during the last fifteen months, and treated principally by the injection of narcotics, after the method advocated by Dr. Alex. Wood, of Edinburgh. I shall offer no apology for doing so. The neuralgic affections form a class of diseases in which our present mode of treatment offers little that is satisfactory. Every practical physician must confess, that after exhausting the most judicious, persevering, rational and radical methods of treatment (and what article in the materia medica and what surgical expedient has not been pressed into service?), he has often been compelled to fall back on the empirical administration of remedies.

To point out a method of treatment which, although not always curative, might at least be generally palliative, when employed in cases adapted to the treatment, has ever been the great desideratum to be reached. Hence it is easy to account for the enthusiasm with which the proposed treatment by "*subcutaneous injection*" has been received by the profession everywhere, both in Europe and America. Indeed, about the time Dr. Wood published his little treatise "*On a New Method of treating Neuralgia by the Direct Application of Opiates to the Painful Points*," I found myself in the same predicament in which, no doubt, many a physician has often, before and since, found himself. I had, for instance, the doleful opportunity of witnessing very often the most excruciating paroxysms of a highly respected friend of mine. For more than seven years had the disease, with ever-increasing violence, asserted its

supremacy over every mode of treatment the most eminent and skilful medical men could devise; and the patient was finally consoled with the delusive hope that another seven years' revolution of the time of suffering would bring the desired rest to her head, to which the neuralgia was confined, and with it to her whole constitution, much impaired by this time. This patient's case will be given in this report. I resolved to try *subcutaneous injection* at the earliest convenient moment, and had soon an excellent opportunity of doing so. Other cases presented themselves. Although some of these were not at all adapted to this treatment—the cause being *central* and not *centripetal*—yet even in those cases where a cure is out of the question, I was greatly encouraged by the relief afforded; the more so, because it enables the sufferer patiently to persevere in a course of treatment adapted to the morbid state in which his disease has originated.

For the sake of brevity in detailing my cases, and to avoid otherwise necessary repetition, I shall call attention—

First, to that most important symptom in this disease—*pain, and its localization.*

Secondly, to the conditions on which the success of the operation in a great measure depends.

Thirdly, to cases, given in the order in which they occurred in my practice, and with the results up to the time of writing this report. The history of each case will be given more or less minutely, as its importance may demand, as well as any constitutional measures and treatment which were pursued at the same time.

Fourthly, I shall perhaps venture to offer a few suggestions as to the probable *modus operandi* of the remedy.

Pain and its localization.—By whatever name we may designate that variety of affections comprehended under the term *neuralgia*, they possess in common the one important symptom of *pain*, more or less violent, situated in the course of a nerve. The greatest disparity of the attacks exists. They may be sudden and violent, gradual or increasing in intensity as the disorder makes progress. It may pay its unwelcome visits with the certainty of the clockwork which announces the departed hour on the dial, or rush into any breach which it may espy in the citadel of the constitution, with the ferocity of an exasperated enemy. Neither the robust and plethoric nor those of feeble habit of body, are exempt from its

inroads. Care, mental anxiety, profuse and weakening discharges, predispose greatly to the malady. No clime nor country, no race nor sex, nay, hardly any age, except perhaps the first years of infancy, is free from it. The inhabitant of the forest writhes under a paroxysm of tic douloureux, as well as the most delicate *habituée* of the fashionable saloons in the capital of Southern Europe or those of the United States. Sciatica pays its unwelcome visits to the celestial Chinese as often, and in as good earnest, as to the serf of the soil of Russia, or the planter of Brazil.

Nevertheless, genuine cases of neuralgia are not so common as is generally supposed. Hence, to test the value of the present proposed method of relieving the pain, it is essential that its application be limited to real neuralgic affections—where the pain is actually seated in the course of the nerve; and it must, moreover, be remembered, that agreeably to the laws by which nervous action is propagated, the irritation, that is, *the pain*, may be seated directly *on*, or reflected indirectly *on the nerve*, at any point between its extreme peripheral distribution and the point at which it joins the brain. To determine the precise seat of irritation, that is, *to localize the pain*, is, then, the first step to be taken towards the proper application of this local treatment, namely, the injection of sedatives.

M. Valleix, in his book entitled "*Traité des Névralgies*, Paris, 1841," first laid *particular* stress upon that most characteristic symptom, *pain*, and states that while, on the one hand, the superficial nerves of the body are of all others the ones most commonly affected with this disease, there are some points in their course in which this pain is more liable to be seated than in others; that no structural alterations have been discovered in the nerves to account for this greater predisposition to pain. He gives to these painful points, or seats of departure of pain, the name of "*foyers*." These are of the utmost importance to us in regard to the treatment. Ample observations and experiments have repeatedly convinced me of the correctness of M. Valleix's statement—that these points are usually more or less morbidly sensible to pressure, even in the intervals between the attacks of the sharp, sudden and intermittent pain. Nay, so great is the morbid irritability in many cases, that whilst firm pressure is borne without any complaint whatever in the rest of the course of the nerve, the slightest touch in these *foy-*

ers, or principal points, is often sufficient to excite acute suffering, sometimes the most acute imaginable. I shall give the history of a case hereafter, in which slight pressure upon the supra-orbital nerve, where it emerges from the supra-orbital foramen, excited such a paroxysm of pain that the patient trembled all over; the spectacle was too sad to be witnessed more than once. But this was not the only painful point in the case; in fact, the whole system was so invaded by erratic suffering that the unfortunate patient seemed to have inherited the threatened doom of Caliban:

> "Thou shalt have cramps,
> Side-stitches that shall pen thy breath up; urchins
> Shall, for that vast of night that they may work,
> All exercise upon thee; thou shalt be pinched
> As thick as honeycombs, each pinch more stinging
> Than bees that made them."

Valleix has classified the painful points in the course of any nerve thus:—

1. The place of emergence of the nervous trunk; for example, the trifacial at the supra- and infra-orbital and mental foramen.

2. The point where a nervous twig traverses the muscles to ramify on the integuments; similar to the parts which are traversed by the posterior spinal nerves.

3. The point where the terminal branches of a nerve expand in the integuments, as the terminal principal branches of all the cutaneous nerves, among which we may mention the anterior part of the intercostal nerves, &c.

4. The point where nervous trunks become superficial during their course, as the peroneal nerve.

Fortunately, the above points are exactly those where the nerve tends towards the surface, and where, consequently, it is most amenable to the treatment by injection.

But Valleix did not confine himself to the above four important landmarks, to be kept constantly in view. With admirable industry and precision, he has described the points of emergence of every branch of the great divisions of nerves which come into consideration in the treatment advocated by himself, namely, the application of successive small blisters in the course of the affected nerve. It is equally important to be perfectly familiar with all these points, in order to apply the method proposed by Prof. Wood where it will prove most effectual and can be most promptly applied.

These points of emergence are particularly numerous in the fifth pair of nerves, which, in at least two thirds of all the cases of neuralgia, is the seat of the suffering, the whole or a branch being affected. For convenience of reference in the cases to be detailed, as well as for practical purposes, and for the benefit of those readers who are not familiar with Valleix's work, I give here the points of emergence of the trifacial, arranged in tabular form. By means of it, is indicated nearly the exact position, at least in very many cases, where the instrument by which the narcotic is injected is to be inserted, when the pain is prominent in a principal trunk, or in some particular branch.

Points of emergence of the ophthalmic branch of the trifacial.

1st. The point of emergence of the *lachrymal nerve* at the external angle of the eyelid, or	*a. The palpebral point.*
2d. Of the *frontal nerve* (external) at its emergence from the supra-orbital foramen, or	*b. The supra-orbital point.*
3d. Of the *nasal nerve*, less determined, and situated a little within and below the internal angle of the eye, or	*c. The nasal point.*

Points of emergence of the superior maxillary branch of the trifacial.

1. The point of emergence of the *orbital nerve* towards the skin of the cheek, or	*a. The temporo-malar point.*
2. The point of union of the *petrosal branch* of the *vidian* with the *facial*, giving origin to the *chorda tympani*, or	*b. The internal auricular point.*
3. The emergence of the *superior alveolo-dental nerve*, or	*c. The superior dental point.*
4. The emergence of the *superior maxillary* from the infra-orbital foramen, or	*d. The infra-orbital point.*

Points of emergence of the inferior maxillary branch of the trifacial.

1. The emergence of the *masseter nerve* where it passes through the sigmoid notch, or	*a. The temporo-maxillary point.*
2. The emergence of the *buccal nerve* into the skin and mucous membrane of the lips.	*b. Point not well determined.*
3. The emergence of the *temporal branch* of the *auriculo-temporal* or *anterior auricular nerve*, between the temporo-maxillary articulation and the auditory canal, or	*c. The auriculo-temporal point.*
4. The emergence of the *lingual* between the sub-lingual gland and the tongue, or	*d. The lingual point.*
5. The emergence of the *inferior dental* from the mental foramen; one of the most remarkable points, or	*e. The mental point.*

Point of interlacement not belonging exclusively to the fifth pair.

There must also be mentioned the interlacement of the *frontal nerve* with the *superficial temporal* and the *occipital major and minor*, situated at the posterior part of the *sagittal suture* and almost immediately above the *parietal protuberance*, or — *The parietal point.*

It would, however, be erroneous to believe that these painful points are met with equal frequency in practice. On the contrary, some present themselves very rarely. If we may be allowed to judge from a large number of cases which we have examined, reported by such authors as Valleix, Sandras, Piorry, Romberg, Downing and others, and from our own observation of fourteen cases, these painful points will be found to occur in frequency very nearly in the following order:

Points of emergence in the order of their frequency.

1st.	The supra-orbital	point.
2d.	" mental	"
3d.	" infra-orbital	"
4th.	" temporal	"
5th.	" nasal	"
6th.	" malar	"
7th.	" dental	"
8th.	" labial	"
9th.	" lingual	"
10th.	" palpebral	"
11th.	" parietal	"

N. B.—With the mental point, the auriculo-temporal point is almost always present.

Frequently, the patient will complain of severe pain just in front and a little below the ear, the place of anastomosis of the portio dura with the divisions of the fifth pair. Whatever may be our opinion as to the real function of the *facial nerve*, whether it is ever affected by this disease, it is quite certain that this form of neuralgia is difficult to diagnosticate, on account of the intimate connection of the "*pes anserinus*" with the trifacial nerve. I have more than once met with cases where the pain was principally confined to this position. Hence arises a most important question for us in regard to subcutaneous injection, namely, where to introduce most properly the sedative in such cases? This difficulty may be overcome if the practitioner will bear in mind the place and mode of union of the portio dura with the three divisions of the fifth. The branches of the facial being three, the as-

cending, transverse, and descending, they are found to form three principal unions.

Ascending, transverse and descending branches of the portio dura.

Place and mode of union of the portio dura with the three divisions of the fifth.

1*st union.*—*a.* Beneath the eye.
b. Between the cheeks (buccal).
c. The side of the nose (nasal).
d. Terminating offsets of the superior maxillary.

2*d union.*—*a.* Between the mandibulo-labialis branch of the inferior maxillary.
b. The cervico-facial branches of the portio dura (on the chin and lower lip).

3*d union.*—*a.* On the temple.
b. On the eyebrow; union of the temporal branches of the facial nerve with branches of the frontal nerve just emerged from the supra-orbital foramen.

Unions less important.—*a.* On the side and crown of the head.
b. " eyelids.
c. " cheek.
d. " lower jaw.
e. The front of the ear.

I shall now, in the second place, speak of *The conditions on which the success of the operation in a great measure depends.*

This may be done briefly, as much that has been said above of *pain and its localization* is directly applicable here. But we must go a step further, and endeavor to ascertain whether the disease is *central* or *centripetal;* in other words, whether the morbid process on which the neuralgia depends be seated in the brain, from whence, as the great centre, all nervous influence emanates, or in one of the conducting trunks by which irritations affecting the ultimate distribution of the nervous fibrils are conveyed to that central organ. We are of opinion that, in cases where the disease arises from within the cranium, the result of this treatment will not answer the expectations, for obvious reasons; and although the local manifestation in the conducting nerve is to a great extent under the influence of treatment, specially directed to it, yet it will do little good, being unable to reach the cause of the disease—I ought to say, its proximate cause—if, indeed, it ever proves beneficial at all. In one case, where the disease is seated unmistakably in the cranium, and in another where there exists caries of the superior maxillary bone, I have failed to perceive any improvement in the violence of the paroxysms, or any cessation of the pain, after repeated and powerful injections. In such and similar cases, as well as in all others where the pain is deep-seated, the result is at variance with the expectations.

On the other hand, in all cases where the cutaneous, and particularly the superficial cutaneous, nerves have been the seat of the malady, this treatment has answered my most sanguine hopes. Even in cases of long standing, when combined with appropriate constitutional treatment, I have succeeded in giving relief, for a considerable period of time, to the painfully harassed patient, after all other possible expedients had been tried in vain.

And let me here append a few words in regard to constitutional treatment in neuralgia, as one of the conditions of success. In almost every case that has come under my observation, a tonic treatment has been indicated. I have tried both mineral and vegetable tonics, and must give the preference to vegetable tonics. I have used the sulphate of quinine in many cases, and in all but one it was followed by good results. I am of opinion that a tonic treatment ought at once to be adopted, with few exceptions; and that the same ought to go hand in hand with the local treatment. Even the local treatment ought only to be resorted to when other remedies have failed. In mild cases of neuralgia, or in cases of recent standing, I have succeeded well with the solution of the valerianate of ammonia, used either in conjunction with injection or alone. I look upon the valerianate of ammonia as a preparation which deserves more the attention of physicians than it has hitherto received. But I proceed to give the cases, as being best adapted to illustrate the above statements.

Case I.—*Neuralgia of all the branches of the Trifacial Nerve, of* 13 *years' standing; non-success of the ordinary modes of treatment; injection at the infra-orbital point; relief.*

In February, 1859, I was requested to visit Mrs. ——, at that time residing in Malden, Mass. The following notes were taken at the visit. Patient is 30 years old, married, mother of a child 3 years old, of a nervous temperament and feeble constitution. Hardly had I entered the room, when I was impressed by the sad object of suffering before me, in a rocking chair. Complexion sallow; skin of the forehead and cheeks drawn together in wrinkles; eyes deeply sunk in their sockets; the lower jaw without teeth; the expression of the countenance anxious, and as if in expectation of some violent paroxysm of pain to disturb the momentary but deceitful calm; the left hand already raised to arrest,

at the first inkling, the delicate muscles of the face, moving, as if charged and agitated by an electric current; giving the face at times a peculiarly distorted and strange expression; patient hardly able to walk for want of strength in her limbs. Such was the *ensemble* presented by this wreck of a long and cruelly tormented frame, grown prematurely old—sustained only by a remarkable strength of character and a determined will. For thirteen long years, she had borne her sad lot. There is but little doubt, that the malady in her case is hereditary. Her mother and a sister have both been subject to neuralgia. She has been more or less unwell from childhood. Experienced, about thirteen years ago, occasional sharp pains in the left shoulder, for which no cause could be assigned, but which, ere long, passed upwards to the left side of the face. Had a tooth extracted, which made the pain worse. For two years, the pain troubled her more or less in the same place, being always aggravated upon taking cold, when, all on a sudden, it made its appearance in the occiput, and extended thence to the right side of the face, where it remained stationary till this day. The intensity of the pain had varied, being, perhaps, better in summer and worse in winter. Short intervals of rest were enjoyed now and then till two years ago, when she miscarried. From that day dates an almost uninterrupted period of suffering, which seemed to reach its climax, when the paroxysms, or rather spasms, obliged her to keep the head turned to the right for two days. The least motion of the head would induce horrible suffering. The pain invaded also, about this time, the back and legs. Since her miscarriage, she had not been free from pain for a single day, and the greater part of the night was passed in a sleepless state. As a last resort, in the vain hope of obtaining relief, about six weeks before my visit, she had all the teeth of the lower jaw extracted, some of which were decayed; but all in vain. The paroxysms came and went away as usual. They still come and go, harassing her more than ever. Her general health is much impaired. Appetite poor and capricious; bowels very irregular. Is exceedingly nervous and excitable. All possible means of treatment have proved nugatory. Nor did she omit to worship at the shrine of "*infallible Homœopathy*," with the glorious satisfaction of testing the efficacy of the wonderful Hahnemannic potencies. She waited for their effect upon the neuralgia with "*expectant*" hope,

till she found she could not afford to wait any longer. At this stage of my interrogatories, the patient was quite free from pain. "I fear," she remarks, "you can do nothing for me just now, doctor, for I am not suffering at this moment." I told her I would see to that, and resolved at once to verify the principles first laid down by Valleix as to finding the most painful point by pressure, the same being also the most eligible one for the operation of injection. She declared herself willing to undergo any operation for the sake of obtaining relief. I determined to try subcutaneous injection; her dentist from Boston, her family physician, Dr. Sullivan of Malden, her husband and sister, being present.

Having placed her in an easy chair, I began to produce slight pressure with the edge of a coin—a ten-cent piece answered my purpose—along the ridge of the forehead. Patient complained of considerable pain, when I pressed near and upon the supra-orbital foramen. But this pain could not be compared in intensity with that which was experienced when I pressed, even slightly, upon the second division of the fifth pair at its point of emergence at the infra-orbital foramen. Pressure there produced the most intense agony. At the same point of emergence on the left side of the face, on the contrary, pressure, even the most firm, caused no pain. Pain was also absent at the mental foramen. Though the patient, when previously asked, could not recollect the exact point where the pain was most severe, so sudden and unexpected was the advent of the paroxysm, and which seemingly affected the whole side of the face equally, now she remembered, at once, that on the cheek, to use her own words, was the beginning of all the trouble.

Having thus found the *infra-orbital point* to be the most painful (although, no doubt, all the three divisions of the trifacial were in this case affected), I charged my syringe with twenty drops of a solution of one grain of acetate of morphia to one drachm of sherry wine, or one third of the drachm solution—which would be equal to two grains of solid opium contained therein—and injected the whole at the *infra-orbital point*, bringing the point of the needle directly to the foramen; a point easily ascertained in this case, because the patient was very much emaciated.*

* I am in the habit of using different solutions of the sedative, adapted to the susceptibility and strength of the patient. For some patients, a very weak solution of the acetate is sufficient to produce distressing nausea and vomiting, even when injected in small quantity, namely, six to ten

The pain of the application was very severe, but the effect not less speedy. Immediately upon the instrument being withdrawn, the surrounding part became œdematous, extending as far as to the nose and upwards to the eye. Mark, however, the effects of

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drops; but I have observed, that the stronger the injection, and the greater the disturbance caused thereby in the system, the more permanent is the result. The great desideratum is to find a sedative to be injected, which does not produce nausea or vomiting. I find that this can only be avoided by using very weak solutions, and then injecting repeatedly, so as to arrive ultimately at the same result as if a stronger solution had been used. I inject the following solutions:—

One grain of acetate of morphia dissolved in one drachm of sherry wine,
Two grains " " " " " " " " " " " "
Three " " " " " " " " " " " " "
Four " " " " " " " " " " " " "

When not particularly stated, when I speak of using the solution in my cases, related above, I have used the one-grain solution. In all other cases, I shall mention the strength of the solution employed. I have experimented with hyoscyamus and with the Indian hemp. I succeeded in avoiding the nausea and vomiting; but neither produced the desired sedative effect upon the pain when injected.

In *Championnière's Journal of Practical Medicine and Surgery*, of September, 1859, Vol. I., No. 9, Art. 5680, there is an extract from a paper read by Dr. Béhier, physician of the Hospital Beaujon, before the Academy of Medicine, on this important therapeutical question.

Mr. Béhier injected a solution of sulphate of atropia, in the proportion of five grains of sulphate of atropia to one ounce of distilled water, which gives about 1-160th grain of the drug to every drop. This mode of treatment was applied in fifty-three cases, of which there were eighteen cases of *sciatic neuralgia*, but only one case of *facial neuralgia*. Out of the eighteen instances of sciatic neuralgia, twelve have been manifestly cured; in six others, cure was more than probable. "Upon the whole," I quote directly from the article before me, "out of fifty-three cases, in which injections of the sulphate of atropia have been used, Mr. Béhier has witnessed eighteen complete cures, usually obtained by a solitary injection, by two at most, and in fifteen other cases he has ascertained constant beneficial effects from this mode of treatment, even when he has been unable completely to follow up his observations. In several patients, four days treatment and two or three injections only, were sufficient to effect complete cure. In some cases, as many as fifteen injections were requisite."—Pp. 386, 387. It may also be mentioned here, although only indirectly connected with the subject of neuralgia, but directly with that of *injection*, that Mr. Béhier has made injections of sulphate of strychnia in seven cases of paralysis. The liquid he used contained five grains to one ounce distilled water, as in the case of sulphate of atropia. Among the facts adduced in support of this mode of treatment, the *Gazette des Hôpitaux* reports several which seem very conclusive.

I have injected the sulphate of atropia, of the strength used by Dr. Béhier, in one case only, of facial neuralgia; the patient is still under my observation, and I shall report the result, perhaps, at some future time, after having tried the effects of this medicine in other cases.

Something ought also to be said here, in regard to the instrument used. The glass syringe, made first by Mr. Young, of Edinburgh, and that of caoutchouc, by Tiemann, of New York, are both good, and answer all common purposes. But they are not exact enough when we wish to reduce the number of drops to a very small fraction; and when we wish just exactly to know how much we have injected, or to limit the amount to be injected. I had, therefore, an instrument made by Mr. Tiemann, of New York, similar to the syringe invented by Pravay for injection of perchloride of iron. At each quarter of a turn of the piston, which is screwed, one drop of the medicated liquid escapes. The body of the syringe holds one half a drachm. To the syringe are screwed trocar needles of the finest kind, and of different lengths. The only objection to this instrument is its high price; the one I have, cost me fifteen dollars, a serious objection to its ever being extensively used, unless the price is much reduced.

the injection upon the nervous system. When asked whether she had any pain now, she answered—"*none at all.*" In about five minutes after the operation, patient said her eyes felt very heavy; she could hardly keep them open; felt as if all her nerves were unstrung. In a few minutes more she was fast asleep. Pulse rose, rapidly at first, from 86 to 104 per minute. In this condition I left her—being obliged to return to Boston. I gave directions, in case she should be attacked by nausea and vomiting—an effect of the injection which I fully anticipated, and requested her husband to report to me, next day, her condition.

Feb. 16th.—This afternoon, nearly twenty-four hours after the operation, patient's husband reports to me the following facts. About an hour and a half after my departure (Mrs. ——— being soundly asleep during the whole of that time, just as I left her), she was attacked with nausea and vomiting, similar to sea-sickness, which continued for several hours at intervals, and obliged her to go to bed. The œdema seemed rather to increase, but she felt no neuralgic pain whatever. When vomiting had ceased, she passed a perfectly quiet night, and was free from pain all the next day. The swelling began to diminish during the night, and was considerably less on Saturday morning. Felt somewhat sick at stomach all day. R. Bismuthi sub. nitratis, ℈ i.; infus. gentianæ, comp., ʒ iss.; aqua menth. viridis, ʒ ss. Ft. mistr. One teaspoonful every half hour till vomiting ceases. Ordered warm hops to be applied to the œdematous part.

17th.—Patient is still free from pain. Slept well all night. Swelling much decreased. Nausea subsided, after taking the medicine prescribed yesterday, twice.

18th, 11, A.M.—To my great surprise, patient enters my office, in person, accompanied by her sister. Seeing her, I expressed my satisfaction and surprise. But she interrupted me:—"I considered it my duty, to come myself this morning, and thank you for the relief you have given me. For the first time, in three years, have I slept three entire nights without pain, since the injection on Friday." In fact, the patient seemed to be very happy at the result; although I told her I feared a return of the paroxysms sooner or later. Is free from pain in the face and head; swelling has almost entirely disappeared. Nothing could be seen of the point where the instrument had been inserted. Thought she felt a little pain

in the fore-arm on her way to the city. I prescribed, also, quiniæ sulphas in one-grain doses, twice per day, and tinct. quassiæ comp. Told her to call on me on the first reappearance of the pain.

April 29th.—Had not heard from my patient, except indirectly, till to-day, when she called at my office in excellent spirits. Has not experienced the least pain whatever in the face or head since I saw her, the 18th of February. A few evenings ago she went out, and it being damp, caught cold; she felt, afterwards, a few pains shooting through the occiput down the neck and spine. Has gained much in strength, in appearance and color of the face. Is able to do again her own sewing. Has taken the quinine and gentian since her last visit.

She complains, however, of occasional pains, shooting down her arms and legs; requests me to inject some morphia into the thigh. I consented; and having ascertained the most painful point to be situated about the middle of the anterior part of the thigh (in the course of the middle cutaneous nerves), I injected ten drops of the solution. The same phenomena presented themselves again, as after the first operation; pain, œdema and nausea. But the injection was not powerful enough this time to produce vomiting. Patient left my office, after an hour or thereabouts, quite comfortable.

May 4th.—The very morning I was about to sail in the steamer Arabia from East Boston for Europe, Mrs. ——— called on me; and during the short interview I had with her, I ascertained that she reached Malden well, free from pain in the thigh, and free from the distressing vomiting of the former operation. Advised her to persevere, during my absence, with the tonic treatment; and recommended in addition such hygienic measures as might tend to invigorate her constitution.

Oct. 2d.—Patient presented herself to-day, being informed of my return from Europe. She informs me that she has had no return of the paroxysms of pain; although she had been kept, for several days and nights, in a constant state of excitement and mental anxiety, owing to the dangerous and nearly fatal illness of her husband. Her general appearance is much improved; has gained strength; is more fleshy than she was six months ago; has persevered constantly in the constitutional treatment; intends to remove to the State of Maine. For a period of seven months, then,

and in fact after the first injection, this patient has been free from her pain, and has continued doing well up to the present time.

Case II.—*Neuralgia of the Lachrymal Branch of the Ophthalmic division of the Trifacial, of seven years' standing; injection at the palpebral point; relief.*

March 3d, 1859, I was consulted by Mrs. ——, Boston, aged 35; mother of one child; of nervo-sanguineous temperament. Has been troubled with neuralgia of the face and head for seven years. The pain is wholly confined to the right side; extends just as far as the sagittal suture; has never invaded the left side of the face at all. It seems to be of a dull, heavy character, almost constant, but at one time more severe than at another. Patient indicates the right malar bone as the seat of her trouble; also, the external angle of the eye, but particularly the spot where the lachrymal branch of the ophthalmic division of the fifth pair emerges. Producing pressure along the course of the nerve with a small coin, I find the pain at and about the supra-orbital foramen less severe than at the *palpebral point;* but still pain is felt there, extending from thence over and along the sagittal suture, down to the parietal foramen. Lately, it has also extended downwards and backwards from the angle of the eye, and become stationary in front of the ear. The important diagnostic question occurred here, whether this pain in front of the ear originated in the portio-dura or one of its branches; or whether it was merely symptomatic pain, caused by the disordered action of the fifth? Subsequent events showed that it was only symptomatic. This pain around the ear has, however, troubled the patient only for the last two weeks. It is neither lancinating nor spasmodic, but a constant, dull and heavy pain. Neither cold nor heat affects it. The general health is much affected; has sometimes so severe pain that she does not know what to do; feels then so perfectly miserable that she is unable even to dress herself. Sometimes the right eye is very painful. Is accustomed to press her hand against the cheek while the paroxysm lasts, and thinks pressure relieves her.

Operation.—I injected fifteen drops of the solution directly at the *palpebral point.* Patient felt very little pain from the injection. A few minutes after, she told me she thought the pain was less than before the operation, but still there was some pain. The

pain around the ear, but particularly in front of it, continued to be very severe. Introduced the needle again, and injected ten drops more at the same point. About five minutes after, she declared herself entirely free from pain. The swelling at the point of injection was very trifling, but a distinct rash appeared. Felt a little nauseated, but soon recovered from its effects. No vomiting.

4th.—Mrs. —— called on me this morning, and told me she had passed the whole time up to the present moment free from pain; although the weather was very chilly, damp and unpleasant, which has generally affected her unfavorably. The swelling had subsided, but the part was still a little sore. As her general health had suffered much in consequence of her continued suffering (the countenance being exsanguine, and the lips nearly colorless), I ordered the following medicine, with generous diet:—R. Citratis ferri, ʒij.; syrupi aurantii, aquæ menth. pip., aa ʒ ij.; aquæ puræ, ʒ iv. M. Sumat coch. parv. ter in die.

16th.—Called on my patient. She has been free from pain till within a day or two, when she again experienced pain in the right temple. I detected the most painful spot still to be situated in the course of the *lachrymal branch*, at the *palpebral point*. Injected ten drops of my solution No. 2; patient felt a severe pain and screamed aloud. The part immediately surrounding the puncture became œdematous and exceedingly tender to the touch. Patient had nausea, but did not vomit; had to retire to bed, feeling too unwell to sit up. About fifteen minutes after the injection, she told me that the neuralgic pain had vanished. Except the tenderness at the point of injection, she did not feel anything at all.

17th.—Part still a little œdematous, but not so tender as yesterday. No pain since the injection.

18th.—Œdema has altogether disappeared, as well as the soreness. Patient is free from pain.

From that period up to the time of writing this report, Mrs. —— has been mostly free from pain. She had a severe attack of fever, followed by varioloid, within the last three months, but no return of the neuralgia. Except during my absence in Europe, the patient has been constantly, and is still, under my observation.

CASE III.—*Neuralgia of the Superior and Inferior Maxillary Nerves, or the second and third divisions of the Trifacial. Injection at different points; relief.*

MRS. ——, of Boston, aged 59 years, married, mother of seven children, of nervous temperament; has suffered from neuralgia for about eight years. The pain is confined to the right side of the head and face, principally to the upper and lower jaw.

What degree of excitability the nerves of sensation of the face may reach, was here most fully illustrated. Would that I were able to describe in adequate terms the indescribable sufferings of my patient; not that I find delight in the recital of a, seemingly, too highly-colored tale; no! but to do thereby inadequate justice and homage to the fortitude and resignation with which Mrs. —— has so long borne her suffering. The least breath of air—loud conversation—a sudden noise—the riding in an omnibus over the pavement—even the noise of a passing carriage or other vehicle, over the street—the act of laughing and talking—the taking of fluids, warm or cold, into the mouth—the touching of the gums with the tip of the tongue, would induce a sudden paroxysm of pain, and cause the patient to give vent to her distress in loud screams. At such times, the muscles of the upper lip and cheek of the right side are convulsed; and by placing the hand upon the affected part, which is exceedingly painful to the touch, a regular throbbing sensation is distinctly felt, going tick—tick—tick, with perfect regularity, and reminding one very forcibly of the appropriateness of the French name of this malady, "*Tic douloureux.*" The course the pain takes, as it shoots along, is generally regular. Starting from the central and lateral incisor tooth, it shoots upwards to the ala of the nose, thence obliquely upwards and outwards to the infra-orbital foramen, thence to the temple, and finally upwards either to the vertex and again along the suture down to the neck, or from the temple down to the pes anserinus and into the lower jaw.

Is it surprising that the patient's health broke down gradually under so much suffering? For the paroxysms would come on often several times during the day and night—often daily for a week or more, and after a short interval of rest, return to assail her anew. Every thing was tried to give relief, from the medicaments ordered by the most able physicians—which gave temporary relief at least —to the most extolled nostrums of the day.

Sept. 14th.—Examined the patient for the first time, with reference to trying subcutaneous injection. From the direction the shooting pain generally takes, and from the fact of its starting always from the two incisor teeth of the right side, I suspected that much of the trouble was owing to the disordered state of the teeth and gums. Such, upon close examination, did not prove to be the fact exclusively. The gums, however, were in an unhealthy state, and the superior and inferior maxillary bones are, I fear, not in the most healthy condition. Much of the mischief in neuralgia is, no doubt, often owing to decayed teeth; but much harm is also done in indiscriminately extracting teeth, believing them to be the cause of the neuralgia; whilst by removing the tooth, *the nerve, the true seat of the pain*, is by no means reached. Many cases are on record, where no benefit at all was derived from such a procedure (vide case No. 1, of this report); and the present furnishes another illustration of the uselessness of extracting one or more teeth, and the benefit derived from the opposite course when warranted by a correct diagnosis. Several years ago, the subject of the present case had one or more teeth extracted, hoping thereby to get cured of her neuralgia, but in vain. And I believe she was advised by her physician, and her dentist too, not to have them removed. She has still a strong hope, that if her teeth were extracted, there would be an end to her neuralgia. The successful removal of the right molar tooth, of late, seems to have strengthened her in this belief. But the reasons for extracting that tooth, done by my advice, after consultation with Dr. Keep, senior, of this city, and for not extracting the others, will be apparent very soon.

I decided first to try the effect of the valerianate of ammonia on this patient—a preparation, of which I have already spoken. I prescribed, as follows:—R. Solutionis ammoniæ valerianatis, ℥ii.; syrupi simplicis, ʒ ii. M. Cochlear. parv. *pro re natâ*. Also generous diet and pure grape wine. Patient was relieved for the time, but the pain soon returned. I concluded to resort to subcutaneous injection the first time it should return and be severe.

Sept. 15th.—Mrs. —— sent for me, having a terrible access of pain. Pressure revealed the *infra-orbital point* to be the most sensitive; I injected ten drops of the solution at that point. Patient felt a sudden warmth pass over her whole body; (complains of having always cold feet and hands, but particularly of the right

side;) five minutes after the operation, or thereabouts, she felt no pain at all, and became drowsy. Left her in that state, lying on the sofa. Œdema at the point of injection inconsiderable; very tender to pressure. Some hours later, she said to me: "What did you inject? That drowsy feeling was splendid; I saw such beautiful visions." Towards afternoon she was seized with nausea, which was shortly followed by vomiting. This continued at intervals until evening, when I prescribed: R. Bismuthi subnitratis, ℈i.; infus. gentianæ comp., ʒ iss.; aquæ menth. pip., ʒ ss. M. One teaspoonful every hour till relieved. Vomiting ceased after taking the first dose. Slept well all night, and was free from pain.

16th.—Still free from pain, except directly over the first molar tooth, at the root of which the pain seems to be situated. Patient is very nervous and weak. Prescribed the following: R. Infus. gentianæ comp., ʒ iij.; extract. valerian., fl ʒ i. M. Two teaspoonfuls three times per day.

17th.—Patient had, last evening, a severe paroxysm of pain in the upper maxillary bone, caused by sudden excitement and much conversation. It subsided after about an hour, under the use of the valerianate of ammonia.

20th.—Was sent for. Patient was very comfortable yesterday, but to-day suffers much from pain in the superior maxillary bone, just at the root of the first molar tooth. Has also pain in the infra-maxillary bone. Injected five drops at the *mental point*, being the most painful point, and about five drops more, close by the right ala of the nose, in a line with the margin of the same. Pain subsided in about ten minutes, and patient felt quite comfortable, with the exception that there was some burning sensation from the puncture made with the instrument. In about ten minutes more a general, comfortable warmth was diffused over the body, and she again passed into a half drowsy state.

21st.—Reports no pain. Comfortable all the rest of yesterday, during the night, and this morning at the hour of my visit. Feels very much debilitated.

26th.—Was requested to see my patient. She reports herself as having been mostly free from pain and more comfortable than ever before, although the weather was very stormy, which had usually affected her very unfavorably. Complains of some pain in the lower jaw, not where I had previously injected, but at the *au-*

riculo-temporal point, and also at the root of the first molar, as usual. Injected five drops at the *auriculo-temporal point*, and five more near the *ala of the nose*. Patient was at once relieved from pain, and felt easier. I must not omit to state that the patient had mental trouble last week, which may be regarded as the exciting cause of these last paroxysms.

Oct. 1st.—Quite free from pain, with the exception of some slight twinges over the first molar tooth. All the suffering seems to be confined to that place. Patient still takes infusion of gentian and valerian. Tried iron and quinine, but neither agrees with her. Appetite excellent. Pulse 82.

2d.—Complains still of pain over the same tooth as yesterday. Very nervous and excitable about the least thing that is said. Injected again four drops near the ala of the nose. Patient was relieved of pain, but felt very sleepy.

3d.—Reports no pain, but feels much prostrated.

4th and 5th.—Patient exercised both days quite violently. Was exposed to sharp winds. Had, each evening, a paroxysm of most excruciating pain, all starting from the molar tooth. Pain lasts about two hours—from 7 to 9, P.M. Was sent for; when I arrived, somewhat late, pain had subsided. All the pain, which is of a pulling, tearing character, is confined to the tooth. Complains of no pain anywhere else.

6th, 9½, A.M.—Was sent for. Patient had another attack in the same region as on the two previous evenings. Feels very feeble; pulse 72. Injected, directly, five drops over the molar, followed soon by relief. Is sensibly affected by the injection; compares it to a crawling sensation all over the body. Begins to sleep.

7th.—Free from pain. Slept well. Feels weak and prostrated, but not so much as yesterday. Continues her tonic and wine.

16th.—Was called to the patient, who has repeated paroxysms, situated, as before, over the molar. The least touch or motion of the lip produces a paroxysm, which lasts about a minute. Pain does not spread. Injected again with good results.

18th.—Is free from pain, but very nervous. Pulse 104.

19th.—Had several severe, though short, paroxysms this morning. Is entirely prostrated by pain, and extremely nervous. Any and everything brings on pain. Suffered so severely in my presence, that I injected eight drops of the solution near the *infra-orbital point*, with immediate good result. Patient insists upon

having the first molar tooth removed, it being the source of all her trouble. Pulse 98.

1 o'clock, P.M.—Consulted with Dr. Keep, Sen., as to the removal of the tooth in question, at the patient's request. Dr. Keep had extracted several teeth, within the last few years, for the patient, with no good effect as far as the neuralgia is concerned. The pain always shifted afterwards. Patient is still free from pain, and under the influence of the injection of this forenoon. The lip can be raised without trouble. Is very nervous; pulse 120, with violent palpitation of the heart. For these reasons the operation on the tooth is postponed till next day, in the hope of getting the patient more calm, and pulse reduced.

20th, 9, A.M.—Met with Dr. Keep at patient's house. Has passed the previous afternoon and night free from pain. Went down stairs to breakfast, and had a paroxysm. Pulse 88. Lip comparatively free from pain. Dr. K. extracted the tooth without trouble. The appearance of the tooth presents nothing abnormal, except that its fang is very rough, almost serrated on one side and more transparent than usual. Says she feels better. At the evening visit the lady is found to be comfortable, free from pain, but still very nervous.

22d.—No pain. Very weak and nervous. Has little appetite. Pulse 92.

24th.—No pain. Feels stronger. Thinks the vegetable bitters and the wine agree with her.

28th.—Patient is still free from pain. Continues to gain strength.

Nov. 3d.—No pain, and much improved. Can eat without difficulty; sleeps well; has been out in the fresh air almost daily; can ride, &c., without suffering from pain.

11th.—Gives a favorable account to-day since I saw her last. Looks better; has a good appetite, and is in good spirits.

From this date my visits ceased; and patient has continued, as I hear, doing well.

I have reported this case in full, in order to present the effects of often-repeated subcutaneous injection; and to show its power of stopping the pain, at least for a considerable period of time, when a possibility of cure is almost, if not entirely out of the question, thus giving, at least, relief from time to time. Here the tic douloureux was so well marked as to leave no doubt in my mind about the nature of the case; the pain was evidently seated

principally in the terminal branches of the superior maxillary nerve, in the mandibulo-labralis and some muscular twigs of the inferior maxillary, and to a slighter extent also in the pes anserinus of the portio-dura. Another fact must also not be overlooked in this case. Patient had always a good appetite, although she was unable to eat on account of the pain caused by the motion of the jaws. Having become much debilitated, a tonic treatment was indicated and vegetable bitters produced the desired effect; whilst iron and quinine could not be borne at all. Much benefit, no doubt, was also derived from the constant use of pure Rhine wine.

CASE IV.—*Neuralgia seated in the right temple; Injection at the Temporo-malar point; Use of the Valerianate of Ammonia; relief.*

Mr. ——, residing in Boston, aged 20, book-keeper by occupation, was attacked, some two weeks ago, with violent pain in the right temple, during the night. Is of the sanguineous temperament, and has always enjoyed good health. Is, however, not robust, but rather delicate. Can assign no cause for the pain. Consulted his physician, who prescribed palliative remedies, in the form of ointment, to be applied externally. Did not derive any benefit therefrom.

Sept. 21st.—Consulted me at my office. Pain has been more or less constant; rather dull and heavy instead of lancinating. His teeth are sound. Upon pressure, I discovered the *temporo-malar point* to be the most painful spot of the affected surface. I advised injection, but he rather objected to it, and expressed his preference for internal remedies. Prescribed the valerianate of ammonia in the usual form, and told him to call on me if he did not get relief till morning.

22d.—Reports having obtained no relief from the use of the medicine. Persuaded him to consent to injection. I injected ten drops of the strong solution at the *temporo-malar point.* About fifteen minutes after the insertion of the narcotic, he complained of giddiness, but declared himself free from pain, which was very violent when he entered my office. Went to sleep for almost an hour. Had no pain when he left me, but the point of injection was very tender to the touch, and slightly œdematous. Patient took tonics for a considerable period afterwards. Pain has not returned, up to the present time.

CASE V.—*Severe pain in the teeth of the right side of the Upper Jaw, occurring during Pregnancy; Injection of Opiates into the gums; temporary and partial, but not permanent relief.*

The patient was a German woman, aged 34 years, of nervo-sanguineous temperament, mother of two children, and four months advanced in her third pregnancy. When I arrived, she complained of pain in all the teeth of the right side of the upper jaw. Suspecting them to be at fault, I examined them carefully, and found them perfectly sound; but on the left side there were two decayed ones. Here, however, she experienced no pain at all. I determined to try the effect of opiates by injection, as everything else had been tried. By means of a curved needle, I injected into the gum fifteen drops of solution No. 4. In about twenty minutes the patient declared her pain to be somewhat less. This being in the forenoon, I called again towards evening, in order to inject once more, so as to give the patient rest over night, if possible, as she had already lost two nights' sleep. Injected again twenty drops of the same solution. Pain was somewhat relieved after half an hour. Patient felt nausea, and soon began to vomit.

When I called next morning, patient informed me that for about two hours after the injection she felt but little pain, but shortly after that time it returned with more violence than ever, and kept her awake all night.

This case not being adapted to the treatment, and having injected for the sake of experiment rather than in the expectation of giving permanent relief, I desisted from any farther operation. The pain subsided, a few days after, spontaneously.

CASE VI.—*Case of Cervico-Brachial Neuralgia of many years' standing; failure of all other remedies; Injection at the Post-Clavicular Point; relief.*

Mr. ——, German, 46 years of age, married, a carpenter by trade, has suffered for many years from severe lancinating pain in his left arm, which he fractured, at the upper third of the humerus, when 12 years old. The pain is generally most severe after exposure to damp or cold weather, or after a hard day's work. Can generally predict, with considerable certainty, the advent of a paroxysm. Pain is sometimes sharp and lancinating, sometimes it partakes of a dull and heavy character. It shoots along the neck, from whence it starts, downwards, is felt all over the shoulder, and

is often most severe at the external angle of the clavicle, at its articulation with the scapula. Pressure revealed that the most tender spot was the *post-clavicular point* of Valleix. I inserted my syringe within the angle formed by the clavicle and acromion process, and injected twenty drops of the solution I generally use. Not long after the instrument was withdrawn, the patient felt sleepy and drowsy. No nausea nor vomiting. He remained lying on my sofa for an hour, and when he awoke, declared himself free from pain.

Some weeks after, he called again, the pain having returned with increased violence. I injected, at the same point as before, fifteen drops of my strongest solution. The same phenomena were observed, and the same results followed. Having cautioned my patient in regard to his dress and over-exertion, and having prescribed some stimulating anodyne liniment, to be used in case pain should be only slight in future, I sent him home. This happened in March, 1859. From that time to the present he has had, in cold, wet and damp weather, occasional and very slight pains, which he says are not worth noticing when compared with his former suffering. Is now working at his trade, perhaps more assiduously than ever.

CASE VII.—*Neuralgia of Twenty Years' standing, seated in the Pes Anserinus of the Portio Dura of the seventh, or facial Nerve, and the third union of the Portio Dura with the Trifacial; Injection at the Temporo-Maxillary point; relief.*

THE following case was placed in my hands by my esteemed friend, George Bartlett, M.D., of this city, in October, 1859.

Mrs. ———, of Boston, widow, 48 years old, mother of three children, of nervo-sanguineous temperament, has been subject to neuralgia for the last twenty-six years. Her father was healthy; but her mother, who is still alive, and 74 years old, suffered from early youth, for many years, from the same complaint. Her two sisters have never had neuralgia. She has been delicate and sickly from childhood, but has never been subject to rheumatism, or any kindred malady.

Twenty-six years ago the patient experienced, for the first time, a very severe paroxysm of pain in the superior maxillary and malar bone, without being able to assign any cause for it. It thence travelled upwards to the vertex, never crossing the median line,

but now and then a sudden, sharp pain would dart down the left side of the face. It continued generally from one to three or five days, and then would be superseded by a severe nervous headache, occurring about once in a fortnight, continuing for three days without abating, and leaving her, at the end of that period, in an extremely exhausted condition. Had some teeth extracted in the hope of getting relief, but all in vain. About six months ago, the pain changed its seat suddenly, and appeared at a point directly in front of the right ear, where the portio dura of the facial gives off its ascending, transverse and descending branches. Since that time, the neuralgia has been entirely confined to the ear itself, and a small space in front and behind it. Complains of a constant noise going on within the ear—similar to the humming of a swarm of bees—which keeps her awake all night. Her general health has suffered much within the last few years; her appetite, however, is good, and the digestive functions are in tolerably good condition.

As every possible remedy had been perseveringly tried with only temporary relief, on taking charge of the patient I tried at once *subcutaneous injection.*

Oct. 11th, 9, P.M.—Suffers excruciating pain in and about the ear. I injected ten drops of the solution between *the temporo-maxillary and the auriculo-temporal point.* Experienced a little nausea. After ten minutes she felt more comfortable, and almost free from pain. Noise in the ear still perceptible and annoying.

Oct. 12th, 9, A.M.—Patient had a comfortable night. Complains of no pain, and declares she had never tried any thing which gave her such prompt relief. Feels weak and nervous. R. Infus. gentianæ, ℥ iii.; extr. valerian., fl ℥ i. M. Sumat. coch., amp. ter in die.

14th, 9½, P.M.—Patient sent for me. Has great pain in and around the ear. Injected fifteen drops of the strong solution at the auriculo-temporal point, with decided relief to the pain. She slept for an hour, and was then troubled with nausea.

15th.—Passed the night free from pain. Ordered her to try, in case the pain should return, the valerianate of ammonia.

16th.—No pain. Pulse weak. Advised her to drink wine.

17th, 18th, and 19th.—Had one of her periodical headaches, but no pain in or about the ear.

21st. Has some pain, but not violent. Injected once more as before. Slept well that night.

Nov. 14th.—The patient to-day is free from pain. The noise in the ear has not returned. Persevered in taking tonics, and particularly Rhine wine, with her principal meal; her general health has in consequence much improved. Appetite good; strength returning. I have seen this patient a number of times since the above date, and find her doing well, continuing free from pain.

Case VIII.—*Sciatica of three and a half years' standing; Injection in the course of the Sciatic Nerve; relief.*

Mrs. ——, aged 26 years, of nervous temperament, but strong constitution, aborted some six years ago. Since that time her health has been impaired. About a year after the above mentioned event, she was treated for prolapsus uteri by the most eminent physicians, but never recovered her former health. Three years ago, she was attacked with severe pain in the right sciatic nerve, starting from the ilium and shooting down the thigh to the knee. The least damp, cold or wet weather, the wearing of thin stockings and shoes, excitement of any kind, or a long walk, would bring on a paroxysm. Warmth and friction generally relieves the pain. In November, 1859, this lady consulted me in regard to her sciatica. Examination revealed tenderness of the whole right hip, and a distinct painful point was felt upon pressure, near the posterior superior spinous process of the ilium, and another farther down, a little below the middle of the thigh.

I had previously advised her to apply ten leeches in the course of the sciatic nerve, to be followed promptly and assiduously by warm fomentations, and Dover's powder, in five grain doses, once or twice during the night. An active cathartic was also given, and followed by good effects.

Nov. 22d.—Pain returned with much exasperation, being very severe and lancinating in the middle of the thigh and around the head of the fibula. I introduced the syringe at the painful point in the middle of the thigh, this point not being larger than a three-cent piece, and ten drops of the narcotic solution were injected without any pain, only producing a slight smarting at the seat of the puncture. In a little more than an hour the pain ceased and the patient fell into a sound sleep. Slept for more than two hours, and, on awaking, declared herself free from pain.

The state of this patient's general health required considerable attention. She is now much better than before, but still far from

being well. She has also had two slight returns of the sciatica, owing chiefly to her own imprudence in exposing herself to a cold and damp atmosphere in the evening. At her own request, she has been treated by opiate injections twice, with decided benefit. Continues doing well; has, however, now and then, slight attacks of pain.

CASE IX.—*Case of Rheumatic Neuralgia of four years' standing; Injection at the Supra-Orbital Point; use of the Valerianate of Ammonia and Tonics; partial relief.*

January 18th, 1860, I was requested to see Mrs. ——, of Boston; mother of five children, of feeble constitution, inclined to consumption, and of a very nervous temperament. For about ten years she has been subject to rheumatism, and is still a victim to it. This malady first attacked her knees, next the articulations of the forearms and fingers. Her family is subject to the same affection. Her heart has never been affected by the disease. Pulse 78. Lungs not in a good condition. Suffers much from sore throat. In fact, ask her what you please, and she will have some complaint or other to make.

About four years ago she was attacked with severe neuralgic pain over the left eye, which at times disappeared and again returned with increased violence. Being very careless in regard to her health, even trying to indulge in the pleasure of skating, and shunning no weather in the evening when the occasion offered, she often suffered from an aggravation of the pain.

I directed my attention first to her general health. In case of pain I tried, with tolerable success, valerianate of ammonia; at other times, the valerianate of zinc, with hyoscyamus, in the form of pills, and vegetable bitters were also given. Having laid down strict rules as to her manner of living, and particularly as to her leaving the house, &c., I had the satisfaction of seeing this patient's health improved, and her pain mitigated.

Feb. 3d.—The pain over the eye is more severe than ever. Pressure at the supra-orbital foramen gives great pain. I injected at the *supra-orbital* point, therefore, ten drops of the usual solution. In a few minutes patient was nauseated. Felt like an intoxicated person. This feeling soon passed off, and she declared herself free from pain. A little œdema at the point of injection, but no rash.

4th.—Is very comfortable. Feels weak and without energy. Continues the tonic treatment.

9th.—Sent for me in the night. Had severe pain in the left temple and over the eye. Had been out in a rain, to a party, the evening before, notwithstanding my directions to the contrary. Upon examination, pressure pointed still to the supra-orbital point as the proper place for the injection. I introduced eight drops of solution No. 4, with good effect. Pain soon ceased. No nausea or vomiting followed the injection.

5th.—Rested well the whole night. Is free from pain. Directed her to continue the tonic treatment.

From the above date to the present, my patient has had but little pain, except in damp and unpleasant weather. Uses still the valerianate, in solution and in pills, with good results.

Five other cases have come under my observation, besides the nine already detailed, but I shall report for the present only the above, and give the history and result of the remaining at some future day.

In no case have I observed any injurious effects to follow the operation, although in most cases I have injected more than once, and in some at more than six different times. In those not unfrequent cases where the disease has a *central*, not a *centripetal* origin, I maintain that the treatment is quite useless, except in giving momentary relief to the suffering patient. In two cases, the puncture was, in a few minutes, surrounded by a blush of urticaria.

Lastly, I shall briefly consider the *modus operandi* of this new method of applying remedial agents.

But let me here state, plainly and unreservedly, that I approach this question of the *modus operandi* with great diffidence. I have no new principles or discoveries in the domain of physiology to advance. All I claim is, to bring into notice those facts scattered through the best works of our modern physiologists, bearing upon this point. These theories, supported by facts, have been collected by Prof. Wood in his little treatise already quoted by me, and this question of the modus operandi has been discussed by him at some length. I have repeatedly and carefully studied the treatise of Dr. Wood. I have sought for and read the authors quoted by him, with reference to this question. I shall therefore do little else than chiefly to restate *his* principal arguments. I may not always

quote him literally, and shall incorporate, when necessary, extracts from the authors quoted by him. The reader will judge, from the actual cases given in these researches, how far the principles laid down by physiologists are borne out by actual experiments and the treatment of the disease known as neuralgia.

Our point of inquiry is, then, have we any means of introducing medicinal agents very rapidly into the body, in a situation where they will not be readily decomposed, and where, in certain cases, we can secure at once their *local* and their *remote effects?*

In neuralgia we have usually a *general* and a *local* affection, a morbid state of the system, arising from many causes, displaying various symptoms, requiring varied treatment, and existing in states of the body the most opposite; a local affection, occurring in paroxysms of violent pain, either regular or irregular, following, like the electric current, the course of the affected nerve, ceasing, either to be suspended for a time, or immediately to recur with still more unbearable violence. An affection presenting characters such as have been described, would appear to demand at once a local and a general treatment; a *local treatment* intended to mitigate the fearful anguish, under which the patient is well nigh driven to despair; a *general treatment* intended to correct the "habitus neuralgicus" on which it depends, and having reference to the causes from which it has arisen, the state of the system in which it exists, and the diseases with which it may be associated.*

Let us first consider the *local treatment and its effect.* Many circumstances in the history of neuralgia seem to point at, and give peculiar facilities to, local treatment. All observers admit that the *superficial* nerves are of all others the most liable to the disease. Hence various methods of applying narcotic and other remedies more directly to the seat of the disease have been introduced. Prof. Wood classifies them thus:

1st. *The enepidermic method,* in which the agent is simply applied to the surface of the skin.

2d. *The iatraleptic method,* in which the absorbents are stimulated by friction to take up the agents which are presented to them in solution or in a minute state of division.

3d. *The endermic method,* proposed by MM. Lembert and Lesieur, in which the obstacle which the epidermis offers to the entrance of the remedy is overcome by previously removing it.

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* Wood on Neuralgia, p. 19.

4th. *Inoculation*, which, largely practised for the introduction of smallpox and cowpox into the system, has been proposed by M. Lefergue St. Emilion, to be extended so as to secure the application of remedies. Dr. Bureaud* does not seem to have been very successful in the application of inoculation with morphine. It was also found, by M. Martin Solon, that the effect produced was very much the same, whether the patient was inoculated with belladonna, or strychnia, or gastric juice, or chyme.†

5th. There ought to be added the plan of local treatment proposed by M. Valleix,‡ which consists in the application of a succession of small blisters over the points in the course of the nerves which are painful on pressure. In all his cases it seemed to alleviate the symptoms. This plan of blistering is not new, but for the application of it to the tender points we are indebted to M. Valleix. He has clearly shown that some points in the course of the nerve are more liable to be affected than others, and that these points are frequently the very ones where the nerve is most superficial. Moreover, these points can in most cases be detected in the course of the disease by their extreme tenderness on pressure. Even in the intervals between the paroxysms, very slight pressure on these points is sufficient in many cases to excite severe suffering, although, in some exceptional cases, firm pressure may be applied without causing any complaint. We are therefore greatly indebted to M. Valleix for the immense improvement in practice, by showing where our local treatment, whatever that may be, ought to be applied. Dr. Wood's own experience has not confirmed the value of simple blisters, and he prefers following them up by the endermic application of morphia. Two strong objections are, however, raised by Dr. Wood against the blistering, or the endermic application of narcotics in this disease—first, the painful nature of the remedy; and, secondly, the mark which it often leaves, which is very objectionable, particularly when the disease is seated in the nerves of the face.§

Thus it is evident that we were still in want of a method of directly applying sedatives to the affected part: but such a method has been suggested by Prof. Wood, and supported by many successful experiments; a method which is almost painless, and calcu-

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* Lancet, 1837, p. 826.

† Bullet. de l'Acad. Roy. de Med., 1836.

‡ Traité des Névralgies, ou Affections Douloureuses des Nerfs; par L. L. S. Valleix. Paris, 1841.

§ Wood on Neuralgia, pp. 19–20.

lated not only to diminish the local pain, but, at the same time, powerfully and rapidly to affect the general system.

Moreover, the experiments instituted by Müller* clearly show that, to quote his own words, "narcotic poisons, when applied locally to nerves, have only a local effect." "I held," he continues, "the nerve of a frog's leg, which was separated from the body in a watery solution of opium, for a short time, and that portion of the nerve lost its irritability, but below the part that the poison had touched, the nerve still retained this function; *opium, therefore, produces a change in the nervous matter itself*, but the influence is local."

The advantages, therefore, secured by this mode of administering narcotics and sedatives are:

1st. A local effect, produced *directly* upon the affected nerve.

2d. A remote effect, ensuing almost *instantaneously*, on the application of the remedial agents.

The first of the above propositions is amply proved by the almost immediate cessation of the pain after the opiate was injected, in all the cases reported by Dr. Wood and many other experimenters, as well as by the cases which I have myself given, and others which have come under my observation. The acute and agonizing pain may, in some cases, have returned, as indeed it did in most of my own, yet still the pain was mitigated and subsided for a time, after the injection, and in some it never returned.

In regard to the second proposition—the remote effect produced by the injection—it is well known that opiates, administered through the ordinary channels, are usually some hours in taking effect; whilst most of the cases which I detailed show with what rapidity narcotics take effect when introduced into the system in this manner. In one case, the patient felt as if she was seasick; in another, immediately after the injection, a drowsy state followed, and the patient saw beautiful visions; a third could not describe her feelings, it was a sort of crawling sensation all over the body, and so on. In a case where Dr. Wood tried injection, the man, who was not at all aware of what was being done, told him that he felt as if he was drunk within a few minutes after the introduction of the narcotic.

We are now led to the second point of our inquiry, namely, *how is this remote effect produced?*

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* Muller's Physiology, by Baly, vol. i., p. 246.

Medicines, remarks Dr. Wood, page 14, when exhibited, have usually two effects:—1st, *the local effect or topical*—the particular effect of a medicine on the tissue to which it is applied; 2d, *the remote effects*—being physical, chemical or vital changes, produced on parts at a distance from those to which the medicine is directly applied, or on the system at large.

The manner in which the local effect is produced is comparatively simple, and depends on the relation of the medicine to the tissue to which it is applied. Thus some applications simply stimulate or irritate the tissue, the effect varying from the least powerful, which merely redden, to the strongest, which produce ulceration, or even gangrene. Others, again, form compounds with the elements of the tissue, thus chemically decomposing or corroding it; while a third class, according to Dr. Christison,* "neither corrode or irritate, but *make a peculiar impression on the sentient extremities of the nerves, unaccompanied by any visible change of structure.*"

Considerable difference of opinion prevails, continues Prof. Wood, as to the manner in which the remote effects are produced. Magendie† and his supporters contended strongly that they were conveyed by absorption from the part to which they are first applied, while Messrs. Morgan and Addison‡ are of opinion that the remote effects are exclusively due to sympathy, or an impression transmitted through the nerves. Other observers, however, among whom may be mentioned Sir Benjamin Brodie and Dr. Christison, unable to adopt either view exclusively, admit this double mode of operation; "a conclusion," which Messrs. Morgan and Addison agree, "that all fair analogy forbids; because it is contrary to Nature's rule," they say, "to adopt two ways of attaining the same end." Absorption is admitted, by all European and American authors, to be the most usual channel by means of which medicinal agents are conveyed from the part to which they are directly applied, so as to affect remote organs, or the system at large. The principal agents by which absorption is effected are *the veins*, though the lacteals and absorbents take up certain agents, but their operation is both limited and slow. Much depends upon the absorbent power of different tissues. M. Vernière§ has shown that the mucous membrane of the intestinal canal absorbs less

* Christison, Treatise on Poisons, p. 1. † Magendie, Annales de Chimie et de Physique.
‡ Essay on the Operation of Poisonous Agents, &c. § Journal des Progres, 1827.

rapidly than the serous membranes, and they, in their turn, are less powerful channels of absorption than a vein or an open wound.

Hence this difference of the absorbent power of different tissues must modify to a great extent the action of remedies. Thus, the stomach and intestines, which are the tissues to which medicines are generally applied, possess a considerable power of absorption, as we might expect from their office; nevertheless, we find, from the experiments of Christison* and Coindet,† that when oxalic acid is introduced under the same circumstances into the stomach of one dog and the peritoneum of another, the dose may be so apportioned that the amount which does not prove fatal to the former kills the latter in fourteen minutes. M. Ségalas found, that half a grain of the solution of extract of nux vomica, injected into the windpipe, proved fatal; while two grains might be injected into the stomach, peritoneum or chest, without any fatal effect, thus showing the power of absorption of the pulmonary membrane.

The skin, which has at various times been employed as a medium for the introduction of medicines into the system, would appear to possess no very active power of absorption, at least, unless it be denuded of its cuticle. "Accordingly," says Dr. Christison,‡ "many active poisons are quite inert when applied to the unbroken skin, or even to the skin deprived of its cuticle. Hydrocyanic acid, perhaps the most subtle of all poisons, was found by Coullon to have no effect when dropped on the skin of a dog." On the other hand, Dr. Madden, in his work on Cutaneous Absorption,§ has shown, from carefully-conducted experiments, the power which the healthy skin possesses of absorbing from a gaseous and from an aqueous medium, and has collected, from various authors, proofs of its power to absorb medicinal substances. Both solids and fluids have been thus absorbed by the skin. Kellie found salivation follow the use of mercurial plaster. Arsenic employed to destroy lice, has been known to produce violent inflammation. Salivation has been produced by the absorption of a solution of corrosive sublimate. Iodine has been detected by Dr. Wadden in his urine, after immersing his hands in a solution of hydriodate of potassa, and he also succeeded in purging himself, by applying to his skin infusions of rhubarb, jalap and gamboge. "Some poisons,"

* Christison on Poisons, p. 29.
† Journal des Progres.
‡ On Poisons, p. 28.
§ Edinburgh, 1838.

says Dr. Christison, "which act slowly through the stomach, cause instant death when injected into a vein."

With regard to the cellular tissue, the same author further states:—"that it is a ready medium for introducing poisons into the blood, especially if an artificial cavity be made where the tissue is loose, but that its power as a medium of absorption has not been, and cannot easily be ascertained. On the one hand, it is difficult to apply poisons to it, without also applying them to the mouths of divided vessels; and, on the other hand, it is difficult to make a set of experiments for comparison with others, on the stomach, pleura or peritoneum, as the cellular tissue does not form an expanded cavity, and consequently the extent of surface to which a poison is applied cannot be made the same in each experiment of a series."* Sir Benjamin Brodie reported in the Philosophical Transactions of 1811–12, some experiments which approach the most nearly to direct injection of the cellular tissue, in which experiments various poisons were introduced into wounds, and were found to produce very speedy results; but in all these cases, the great division of parts exposed so many blood-vessels, that it is not easy to say how much of the effect was due to the cellular tissue, and how much to the action of the divided vessels.

The preceding, being quoted from Prof. Wood's Treatise, he adds:—"I am at present engaged in some experiments on this subject, in which, by means of an improved apparatus, various substances have been introduced into the cellular tissue with comparatively little injury to the adjacent vessels, and, as far as these have gone, they would lead to our ascribing great absorbent power to the cellular tissue."† What has been stated proves satisfactorily:—

1st. That medicines are more rapidly absorbed by some tissues than by others.

2d. That the stomach is by no means the most rapid way of introducing medicines into the system.

3d. That the cellular tissue has a great power of absorption.

From the cases which I have submitted at some length in this paper, I think it may be safe to arrive at the following important

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* Christison on Poisons, p. 30.

† I know that Prof. Wood is at present engaged in writing a treatise on the subject of Neuralgia, and I have no doubt, when all his experiments and cases are given to the profession, with reference to subcutaneous injection particularly, he will throw much light on the subject, and the book, being not only of practical value, will also be a most valuable addition to medical literature.

conclusions, with which Prof. Wood concludes his consideration of the *modus operandi.*

1st. That narcotics, injected into the neighborhood of the painful point of a nerve affected with neuralgia, will diminish the sensibility of that nerve, and, in proportion, diminish or remove pain.

2d. That the effect of narcotics, so applied, is not confined to their local action, but that they reach the brain through the venous circulation, and there produce their remote effects.

3d. That in all probability what is true in regard to narcotics, would be found to be true in regard to other classes of remedies.

4th. That the small syringe affords a safe, easy, and almost painless method of exhibition.

5th. That, destitute as we are of any precise experiments as to the applicability of the cellular tissue as a medium for the reception of medicinal agents, the experiments made with the syringe show that it seems to offer an excellent surface for the operation of the absorbent action of the venous system.

6th. That the method now detailed seems as extensively applicable as any of the methods of applying remedies to the skin, whether enepidermic, iatraleptic, endermic, or by inoculation.

Finally, the above conclusions, arrived at after the considerations of the *modus operandi,* may not be entirely satisfactory and conclusive to some of the readers of this paper. Such, however, need not be apprised of the existence of many phenomena presenting themselves in health, and particularly in disease, the causes of which cannot be ascertained. Too often we have, indeed, to content ourselves with the maxim of Cicero—"*Sufficit si quid fiat intelligamus, etiamsi quomodo quidque fiat ignoramus.*"