NEW TREATMENT OF ATAXIA.

ALTHOUGH, to use Voltaire's expression, medicine too long remained "the art of putting drugs which we do not know about into a body which we know still less about," we shall not reproach contemporaneous science with having persevered in following this antique course.

To-day, medicine is, before all else, hygienic, hydro-

SUSPENSION APPARATUS.

pathic, electric, pneumatic, hypnotic, magnetic, etc., and hardly pharmacologic any longer. The remedy is taking its departure, driven out by the process. Yesterday, we recommended consumptives to keep to their rooms; now we send them out to take a walk. We have been treating those afflicted with nervous troubles with valerian and bromide; hereafter, we are going to hang them! Hang them! Is it possible? That is about it; only we shall use the word *suspend*, so as not to frighten them too much. Still, future usage of it under such circumstances will be wholly improper, for it is quite six months since we have been *hanging* them. After all, what is there surprising in it, since the method succeeds? It is giving proofs of its efficacy every day. Everybody is already talking about it. To-morrow it will be the rage, and next year we shall all be hanging ourselves.

At Paris, up to the present, it is at the Salpêtrière, and in Prof. Charcot's interesting service, that suspension is especially under experiment; but all the merit of the invention appears to be due to Dr. Motchoukowsky, of Odessa, who, as long ago as 1883, published a note upon the good effects of this singular process in the treatment of locomotor ataxia and of some other diseases of the nervous system.

The lamentable state usually exhibited by subjects afflicted with that serious affection of the spinal cord, chronic *myelitis* or *tubes dorsalis*, which manifests itself, after very acute pain in the limbs, by paralytic disorders, is well known. It is impossible for these unfortunates, who are unable to stand erect upon their legs, to take a step without the risk of falling. At every instant, if they try to walk, they are seen to stumble, stagger, and put their feet (which do not feel the ground) one before the other by jerks. In darkness, they cannot budge without getting a fall, and if they close their eyes, they believe themselves to be truly suspended in the air. May it not have been this odd sensation, which is more or less common to all tabetics, that accidentally suggested to Dr. Motchoukowsky the idea of suspending them for their good? "*Similia similibus curantur*," say the homeopaths. But such was probably not the genesis of the invention. In fact, American specialists antedated the Russian physician in suspending ataxic patients in order to inclose them in a plaster jacket designed to keep up this forced extension for some time. It was after practicing this operation a number of times that Dr. Motchoukowsky thought that he could attribute its results, not to the plaster jacket, but to the suspension solely. From this moment he suspended all his patients, and the novelty of the method contributed none the less than did its advantages to give it a reputation.

Much in practice now in several large cities of Europe (the reason why will presently be seen), the method of suspension has been but very recently revealed to French physicians by Dr. Raymond, on his return from

POSITION OF THE HEAD IN THE APPARATUS.

a medical mission to Russia, where he was guided by Dr. Onanoff, a pupil of the Salpêtrière.

In order to judge scientifically of the value of the method, Prof. Charcot has been pleased to allow his chief of staff, Mr. Gilles de la Tourette, to experiment upon it; and that is how it is that numerous ataxics,

attracted by the great renown of the learned physician, are at present going two or three times a week to him to ask to be hoisted high and dry by the rope of salvation.

But let not the poor lame imagine that if a person goes to the hospital upon crutches he will return as if from the fountain of youth. "As soon as taken, so soon hanged," is a dictum that has been current for a long time; but, unfortunately, we do not as yet say: "As soon as hanged, so soon cured."

Although the suspension apparatus in nowise recalls the gallows, and the treatment in itself is entirely inoffensive when it is properly applied, it is, nevertheless, not a genuine pleasure to feel one's self lifted by the head to a few inches above the floor. It is necessary to get used to it, in order to acquire the habit and to learn how to remain gradually from half a minute to four minutes in the air.

The operation is practiced at the Salpêtrière with every desirable prudence, by means of the Motchoukowsky apparatus, which is very accurately represented herewith from original sketches that Dr. Paul Richer has been good enough to put at our disposal. It consists essentially of a stiff bar, in every respect like a scale beam, and supporting, through its terminal hooks, a leather strap. After the patient has put his arms, up to the armpits, through two padded slings supported by the straps, his head is imprisoned in a double sling which is attached above to the transverse bar and serves as a strong point of support beneath the nape of the neck and the chin. Thus harnessed, the patient has nothing further to do but to be hoisted. A pull upon a rope running over a pulley suspended from the ceiling and supporting the apparatus, and the thing is done.

Not long ago, in a very remarkable lesson, Prof. Charcot made known the results of suspension upon the ataxics treated at the Salpêtrière. They are encouraging enough to make the experimentation worth being continued, despite that, out of eighteen tabetics, more or less improved, none, truly speaking, has been radically cured. But it is something at least for the afflicted to have succeeded in gradually holding them-

SUSPENSION OF A PATIENT.

selves erect, in making a few steps, and walking without aid, when it could not be done before, and when the classic treatment by application of fire along the spine was powerless to produce these same improvements. Between being hanged or burned, ataxic patients will, therefore, probably prefer hereafter efficacious suspension to ineffectual cauterization.

What renders the new method particularly interesting in the eyes of the general public is that it does not appear to be useful solely to the victims of ataxia. In all times, as we know, true hanging, that in which a person is "hanged by the neck until he is dead," has been rightly regarded as a relatively agreeable punishment, and only cruel in that it too quickly destroys sensations that have been awakened for a moment. Now hanging attenuated by the Motchoukowsky process undeniably possesses, although to a less degree, and without strangling a man, the stimulating and regenerating properties of complete hanging.

Perhaps we have here the least serious side of the question, but to a wholly different category of infirm persons it opens up such horizons that many of them will certainly risk wryneck in order to recover their extinct animation and lost energy in suspension.

Besides, there is no doubt that at Paris, as elsewhere, some large sanitary establishment—hydropathic or bathing—will soon give its most ailing patrons an opportunity of profiting by this peculiar kind of gymnastics. High livers out of wind, prematurely old men and *blasse* youths; it is by multitudes and legions that it would be necessary to name those sad victims of Paris high living that will hereafter be amenable to suspension.

What a rich clientage, too, for the Salpêtrière if, among its acknowledged tabetic and ataxic patients, the old hospital were pleased to admit all this somewhat mixed crowd of debilitated and neurasthenic persons!

But poverty and disease alone have an entrance to these hospitable clinics, in which, in helping the unfortunate, only the higher interests of science are considered. So those who are simply whimsical and wish to experiment with the Motchoukowsky process merely

from a physiological standpoint will do well for the present to go somewhere else to get hanged!—*L'illustration*.

ON THE USE OF TOBACCO.

By FRANCKE H. BOSWORTH, M.D., New York.

IN one of Columbus' earlier voyages of discovery his men, returning from the exploration of one of the smaller West India Islands, reported that they had seen the natives holding firebrands in their mouths, the smoke of which was permitted to escape through the mouth, nose, and ears. A closer inspection discovered their mistake, and for the first time made Europeans acquainted with the pleasures and delights of the use of tobacco. Its adoption and introduction among the people at home followed, and but a few years elapsed before its use became common among all civilized nations. Like all new ideas, its introduction met with opposition, and its use was interdicted by law, and forbidden by papal anathemas and clerical exhortation. Royal edicts were promulgated against it, and numberless tracts published setting forth its dangers; James I., among others, publishing his well-known tract setting forth the evils of the use of the "pernicious weed." His teaching has been forgotten, but it is interesting to record that the name which he gave it survives to this day, only we call it the "fragrant" weed, and not the "pernicious weed." Notwithstanding all this opposition the use of tobacco has increased and extended, until to-day it is probably used by every people on the face of the globe, constituting the one single universal article of commerce, in that it not only figures prominently in the commercial statistics of every civilized nation of the world, but is sold to, or cultivated by, all peoples, whether civilized or uncivilized. It is probably a well authenticated fact that the aborigines of America were the one people on the face of the globe who had not discovered a method of preparing an intoxicating beverage, and who were not addicted to the use of alcohol. It is a somewhat curious fact, then, that the most notable gift which civilized Europe received from America was tobacco, while its most notable gift in exchange was alcohol. The commentary is scarcely necessary that it was not the civilized world that suffered by the bargain. The crusade against tobacco which was inaugurated upon its first introduction to civilization continues to the present day, and it becomes a matter of some interest to inquire, in all candor, how far the charges made against it are to be accepted. Burton, who was by far the best read man, and one of the shrewdest, of his day, writing three hundred years ago in the "Anatomy of Melancholy," sums up in his quaint way as follows: "Tobacco—divine, rare, super-excellent tobacco, which goes far beyond all their panaceas, potable gold, and philosopher's stones. A sovereign remedy to all diseases. A good vomit, I confess, a virtuous herb if it be well qualified, opportunely taken, and medicinally used, but as it is commonly abused by most men, which take it as tinkers do ale, 'tis a plague, a mischief, a violent purger of goods, lands, health. Hellish, devilish, and damned tobacco, the ruin and overthrow of body and soul."

Making all allowances for his exaggerations and pessimistic habit of mind, is there not something of suggestion in this quotation, and are we not in some danger of falling into the routine habit of condemning the use of tobacco and ignoring the difference between its use and abuse? Carlyle, in his "Reminiscences," tells how he once rode sixty miles to Edinburgh "to consult a doctor, having at last reduced my complexities to a single question: Is this disease curable by medicine? or is it chronic, incurable except by regimen, if even so? This question I earnestly put; got response: 'It is all tobacco, sir. Give up tobacco.' Gave it instantly and strictly up. Found, after long months, that I might as well have ridden sixty miles in the opposite direction and poured my sorrows into the long, hairy ear of the first jackass I came upon, as into this select medical man's, whose name I will not mention." Carlyle evidently consulted a more devoted disciple of Father Trask than of Æsculapius.

A few days ago I noticed, in one of our daily papers, a certain action taken by a prominent religious body in one of our Western States which was something as follows: "Whereas, the use of tobacco in any shape or form is a filthy, pernicious, and degrading habit, imperiling the health of the body and the welfare of the soul alike, leading to a laxity in living which is the sure road to intemperance and all vice," etc., etc.; "Therefore, it is resolved that this conference will not grant ordination or license to preach to any candidate who is a victim to this debasing habit." In the London *Lancet* of a few months ago I recall an opinion which it was almost refreshing to read, for the mere courage which enabled the writer to make so bold an assertion. I only remember now the general tenor of the article, which was that, as far as the writer's observation served him, he failed to see that the use of tobacco either shortened life or impaired the health of the average man, but, on the contrary, it was an open question, bearing in mind its well known action as a nerve sedative, whether, on the whole, its use might not be beneficial in quieting the overwrought nervous system, soothing a brain overtaxed by the cares and anxieties attendant upon an active, busy life. It is mainly with reference to a few of the questions suggested by the above that the brief paper I have to offer to-night has been prepared.

The Anglo-Saxon races have been smoking and chewing now for nearly four hundred years. They contracted the habit from a race which, as far as history and tradition teach us, were remarkable for their vigor of body and mind as well, and, as far as we know, were an unusually long-lived people. In the time that we have been using the weed there is no evidence to show that the race has in any way deteriorated, but, on the contrary, it is abundantly shown that the average duration of life has increased nearly fifty per cent. There is no evidence to show that in this time the race has been more subject to disease, but rather that they are less so. There is no evidence to show that the race has lost anything in its intellectual activity, but, on the contrary, it has been a time of most marvelous fecundity in all that is great in literature. Let us look more especially at the specific action of tobacco. It is used in smoking, chewing, in snuff, and in dipping. As far as its specific action is concerned, we are only

interested in the two methods of its use—in smoking and chewing. The usual analysis of tobacco now accepted is that of Posselt and Reinmann, which is as follows:

<i>Analysis of the Leaf.</i>	
Nicotine.....	0.060
Volatile oil	0.010
Bitter extractive matter	2.370
Gum and malate of lime.....	1.740
Chlorophyll	0.267
Albumen and gluten.....	1.308
Malic acid.....	0.510
Salts of pot. cin. and ammonia.....	0.734
Silica.....	0.058
Water.....	88.280
	100.00

Leaving out from this analysis the volatile oil, extractive matter, albumen, gluten, and chlorophyll, and negative and inert matter, and we have left a substance containing one part of nicotine, 4 parts of salts of lime, ammonia, etc., with 88 parts of water in 100. It is interesting to note, in this connection, that the percentage of nicotine in various kinds of tobacco varies, and that Havana tobacco contains but two per cent. of this poisonous element, while Virginia tobacco contains about seven per cent., according to some analyses. The moral of this is that we should always smoke the choicest brands of Havana cigars. In smoking, the ammonia salt may become the source of considerable discomfort in the burning and smarting tongue which results from excessive and continuous practice of the habit; of course, in chewing this action is not noticeable.

We thus are reduced to the action of nicotine for the possible deleterious influence of the plant. This element, as before stated, is present in varying proportions in the tobacco leaf; according to some writers, from one to seven per cent. It is a clear and colorless fluid, highly volatile, and of an extremely pungent, disagreeable odor and strong, burning taste. It is rapidly absorbed into the fluids of the body, and is one of the most deadly poisons known. It is rendered volatile by burning the leaf, and is present in the smoke of the tobacco. It is generally accepted that the volatilized nicotine in the tobacco smoke is more actively absorbed than is the case when the leaf is chewed, but in either case the nicotine absorption is the essential element in the production of all of the evils which can be charged to the habit.

Nicotine acts on the heart, nervous system, stomach, and upper air passages. The prominent symptoms which may be caused by nicotine, with reference to the heart, are intermission and palpitation; that is, it produces certain functional disturbances of the heart which, for the time, may be the source of more or less discomfort to the patient; but the important point is, does this condition ever lead to one of organic lesion?

I find but one writer bold enough to say that this occurs, and he only hazards the opinion (Dr. Kennedy, of Dublin) that the functional disorder may in cases eventually lead to the development of fatty changes in the muscular structure of the heart. On the other hand, there is abundant evidence to show that this is an extremely rare event. Few of us but have met with what we call a smoker's heart, one characterized prominently by the intermittent beat with some little irregularity of action and with which there may be the clinical history of occasional attacks of moderate palpitation brought on by overexertion. We keep these cases under notice, it may be for years, and we rarely, if ever, discover anything that we can call an unfavorable progress, the development of any new symptom or any evidence of weakness of the muscular structure of the heart. I confess that this is not easily to be explained. I am disposed to regard the term functional disorder as merely a cloak to conceal our ignorance of the real pathological condition, and believe that there is really a structural change of some kind which escapes our present methods of exploration, and while such imperfection exists in our means of physical diagnosis, we must continue to use the term functional disease. Still, in the case in point, whatever be the cause or explanation, we have a purely functional derangement which may exist for months or years without the occurrence of any grave or serious complication to cause apprehension.

The true explanation of the action of nicotine on the heart is probably to be found in its action on the general nervous system, and especially on the pneumogastric nerve. In acute nicotine poisoning, death has been known to take place in thirty seconds. This can only be explained by its action on the nervous system. (Of course, the prominent symptoms of acute poisoning are on the circulatory and respiratory movements. It arrests respiration or markedly interferes with it, and if sufficient of the drug has been given it arrests the heart's action, producing almost instant death. We may, of course, say this is due to its immediate action on the medulla, or to its action on the pneumogastric nerve. Certainly, there is abundant clinical evidence to show an especial affinity of the drug for this nerve, whether in cases of mild or severe poisoning, as in acute or chronic cases. We may, then, sum up its action on the nervous system in producing disturbance of vision, giddiness, muscular tremors with exhaustion, sleeplessness, and depression of spirits. In addition to these, the irregularity of the heart's action may be classed as a nerve symptom, dependent on the impairment of control which the pneumogastric nerve exercises over it.

Another organ prominently affected by the tobacco habit is the stomach, giving rise to a gastric catarrh, with its usual train of symptoms, gastralgia, acidity, nausea, anorexia, etc., and which it is, of course, unnecessary to describe. The idea that this is due to the local irritant action of the nicotine or of the saline constituents of the tobacco is not to be entertained. For although, occasionally, we meet with a tobacco chewer who swallows the saliva impregnated with the tobacco juice, he possesses happily a very rare and unusual organization who can do this with impunity. The nicotine action, then, on the stomach must also be explained by its parietic action on the pneumogastric nerve. In this case we have to do with a secreting organ whose healthy functional activity depends largely on the nerve force supplied by this nerve. If now the nerve is under the influence of this powerful narcotic, the organ when called upon for the performance of its normal digestive function is found un-

equal to the task, and the ingesta act as a local irritant, with the result of producing a local catarrh, and each subsequent demand upon it only serves to aggravate the existing condition.

Coming, now, to the upper air passages, we find here a portion of the body which is not a glandular structure or a secreting organ *per se*, and hence one which is not liable to such impairment or perversion of function as may react in any way on the general system. It is merely a passage lined with mucous membrane, through which the inspired air carries oxygen to the air cells. Now, the use of tobacco may affect this either by direct contact or it may affect it indirectly through the effect of the nicotine on the general system. Its action through the general system can be but limited, as its effect here would be simply in diminishing secretion. We must look, therefore, for its injurious effect upon the direct contact of the smoke with the mucous membrane. Now, in those in the habit of smoking, the fumes of the tobacco come in contact with the upper air passages ordinarily in but a limited extent. In fact, of two persons in a room whose atmosphere is saturated with tobacco smoke, one smoking and the other not accustomed to the habit, it is the non-smoker who will suffer. Furthermore, if we examine the physical characters of tobacco smoke more carefully, we find its analysis is as follows: Nicotianin, carbonate of ammonia, acetate of ammonia, empyreumatic oil, carbonaceous matter, moisture, and several juices.

Passing over these latter as merely the result of the destruction of the woody fiber, we have again the salts of ammonia and the nicotine comprising the essential elements of the tobacco smoke. So that, whether smoked or chewed, we find the active elements of possible influence of the plant in the nicotine and the saline constituents. The saline elements need but a passing word. They are in a high state of solution and their action is but feeble. Absorbed by the mucous membrane, their action is nothing. Their local action on the mucous membrane of the mouth and throat is merely as a feeble stimulant and irritant. If their action be long continued, this irritation may become quite prominent. This we have all noticed who have been addicted to something more than moderate smoking.

It is a fair inference, I think, then, that the use of tobacco, in its influence on the respiratory tract, does not directly produce the morbid condition which it is usual to charge upon it by direct action, but that it is only through the indirect influence of the nicotine absorption through the general nervous system. Now, the evidences of chronic nicotine poisoning are well known and easily recognized by the muscular tremor or unsteady hand, the dull headache, the retarded or irregular heart action, the sleeplessness, and other symptoms; and unless we have some evidence, as shown by some of these symptoms in persons addicted to smoking or chewing, of this chronic poisoning, I do not think that we are justified in attributing the existence of a pharyngeal or nasal catarrh to the use of tobacco, although undoubtedly, in many cases, an existing catarrhal condition of the fauces may be aggravated by the use of tobacco, its action being possibly the slightly irritating effect of the volatilized saline constituents of the smoke and possibly the empyreumatic oils, but mainly, I take it, through the constitutional effect of the drug as acting upon the secretions through the nerves which regulate this function.

While, therefore, by no means advocating the use of tobacco, the point which I desire to make is: Are we not often liable to fall into a mistake in universally condemning its use without sufficient grounds, and is it not better when our advice, as physicians, is asked, in this respect, to base our answers entirely on the evidences of the effect of the drug upon each individual patient and, furthermore, to recognize the fact that this effect is shown by well marked and easily recognized subjective symptoms? I have frequently, when asked this question, "Does smoking hurt me?" frankly said to my patients, "You know better than I do; no man uses tobacco to his harm without being fully conscious of it."

As regards its effect on the diseases of the upper air passages, in a practice of twenty years largely devoted to treatment of these affections, I recall but exceedingly few cases wherein I have found it necessary to interdict the use of tobacco as injuriously affecting in any way these passages, or as interfering with the success of treatment.

The object of my paper, then, is not a plea for the use of tobacco, but simply to suggest whether we had not best abandon the idea that it is a drug whose use is pernicious in every way to body, mind and morals, and rather to take the view that it is one of God's good gifts to man; a "virtuous herb, divine, rare, super-excellent tobacco" when properly used, but when taken "as tinkers do ale, 'tis hellish, devilish, and damned tobacco."—*Medical Record*.

REMOVAL OF TATTOO MARKS.

NEARLY every year we have one or more letters of inquiry as to the means for removing tattoo marks, and we have been obliged to reply that, practically, it is not possible. Dr. G. Variot, of the Paris Biological Society, has however lately proposed a process which he declares to be invariably successful in removing blue and red tattoo marks. As the doctor is attached to the central infirmary of the Paris prisons, he has undoubtedly abundant opportunities for experimenting, and should be able to speak intelligently. Dr. Variot operates as follows:

The tattooed parts are first wetted with a concentrated solution of tannin, and then, with a set of tattooing needles, the skin is punctured all over the colored portions to the depth usually adopted by professional tattooers. All the parts tattooed with tannin are then rubbed over with a crayon of nitrate of silver until the needle pricks have turned black. Excess of liquid now being wiped off, matters are allowed to take their own course. The whole surface treated will soon turn black. The pain, which is quite moderate during the operation, continues to be slight for the first two days, and is attended with some local inflammation. After the third or fourth day no pain is felt, and, excepting for large marks, no dressing will be necessary. After fourteen or eighteen days the eschar will fall off, and leave, instead of the tattoo marks, a reddish, superficial

cicatrix, which will gradually turn pale, and after two months will almost disappear.

TRAUMATIC EPILEPSY SUCCESSFULLY TREATED BY TREPHINING.

By F. A. SOUTHAM, M.B. Oxon., F.R.C.S., Assistant Surgeon to the Manchester Royal Infirmary and Surgeon to the Clinical Hospital for Women and Children.

WILLIAM F.—, aged thirty-two, telegraphist, came under my care as an out patient at the Manchester Royal Infirmary in August, 1887, with the following history. In December, 1886, having previously enjoyed good health, he fell from a height of sixteen feet and sustained an injury to the head in the left temporal region, apparently a severe scalp wound without any fracture. He was removed in an unconscious condition to a local hospital, where he remained for about three weeks.

At the end of this period he was discharged, having quite recovered from the effects of the accident. Shortly afterward he began to suffer from attacks of a somewhat peculiar nature. Without any warning, he would suddenly be seized with twitchings limited to the muscles of the right side of the face, and almost simultaneously he would become dizzy and fall to the ground in a state of complete unconsciousness, remaining in this condition for a varying period, often for several hours. In the intervals there was no evidence of paresis in the muscles of the face or any other part of the body; speech was not affected, and there was no loss of sensation or impairment of any of the special senses.

The attacks recurred at irregular intervals, sometimes as many as six daily, sometimes three or four a week; occasionally a week, but rarely longer, would pass without one. He again sought treatment at the same hospital, and underwent two operations, which from his description consisted in liberating the scar on the scalp by dissecting it up from the bone beneath; each operation was followed by a temporary cessation of the fits, which, however, soon recurred.

The man was suffering from a continuance of the same symptoms, which completely incapacitated him from following his occupation, when he came under my observation. On examination, a well-marked adherent cicatrix about an inch in length was found in the left temporal region; no depression could be felt in the bone beneath indicating that there had been a fracture. He was put on a course of bromide and iodide of potassium for three weeks, but without any relief to the symptoms, the fits recurring as before. My colleague, Dr. Ross, then examined the patient with me, and as the case appeared to be one of traumatic epilepsy, due to irritation of the brain at the seat of injury, he recommended that the skull should be trephined at this spot. On Sept. 7, 1887, the operation of trephining was performed with careful antiseptic precautions. The old scar was dissected up from the bone beneath, and the pericranium having been reflected, a crown of bone the size of a shilling was removed at a point two inches and a half above and one inch behind the external angular process of the frontal bone. The piece of bone removed did not present any evidence of fracture, but was irregularly thickened and sclerosed, the diploe having disappeared and been replaced by dense, compact, osseous tissue; its outer surface was roughened, and at one point on its under surface there was a bossy elevation, a quarter of an inch in diameter, whiter in color and of denser consistency than the surrounding bone.

The exposed portion of the dura mater was rough and unduly adherent to the bone; otherwise it presented a healthy appearance; as it did not bulge into the trephine opening, and there were no evidences of intracranial tension, it was not incised, for it was thought that the irritation caused by the pressure of the thickened bone was sufficient to account for the symptoms. The wound was then closed, the pericranium being brought together with catgut and the scalp with silver sutures, and a small drainage tube inserted.

Healing rapidly occurred, with very little suppuration, the temperature never rising above 99°. On the eleventh day the patient was sitting up in the ward, and on the twenty-third day he left the hospital, there having been no return of the fits since the operation. About a fortnight later, however, they began to recur at irregular intervals, but in a very much milder form than previously, consisting merely of attacks of giddiness accompanied by pain in the head, but without any loss of consciousness, and, except on one occasion, without any twitching of the muscles of the face. These attacks gradually became slighter and less frequent, and since January, 1888, he has been entirely free from them. In the following April he was able to resume his occupation as telegraphist on the railway, and at the present time is in the enjoyment of perfect health, being as well as he was previously to the accident. The seat of the operation is now indicated by a depressed scar. There is no tenderness on pressure over it, and no pulsation can be detected.

Remarks.—As regards the explanation of the epileptic attacks, which were the secondary result of the injury to the head, it is probable that at the time of the accident, in addition to the wound of the scalp, more or less bruising or contusion of the bone beneath was also produced. This was followed by inflammatory changes in the bone, and probably also by some inflammation of the subjacent dura mater, in consequence of which the bone became thickened and sclerosed and unduly adherent to the membrane beneath. The result was that pressure was produced on the cortex of the brain, and this, acting as a source of irritation, gave rise to the fits from which the patient suffered.

It is interesting to note that the fits commenced with twitchings of the facial muscles on the opposite side to that which was the seat of injury.

According to the observations of different experimenters, the center which presides over the movements of the face is situated in the lower and middle part of the ascending frontal, the lower end of the middle frontal convolutions. Now, the portion of bone removed with the trephine would overlie the posterior end of the middle frontal convolution, and the successful result of the operation is doubtless to be explained by the fact that the pressure upon the surface of the brain at this