Two Cases of Trephining for Traumatic Epilepsy.

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TWO CASES OF TREPHTNING FOR TRAUMATIC EPILEPSY.¹

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At the first Congress of American Physicians and Surgeons the subject of brain surgery excited much interest; at the second Congress the interest was as great, but three years' additional experience rendered the views of those who took part in the discussion distinctly less hopeful. This was especially the case with the question of trephining for epilepsy. The hope of cure from trephining in traumatic epilepsy, or from excision of the cortex in Jacksonian epilepsy, is now regarded as slight, although relief is not infrequently obtained. Some men, indeed, in the discussions took, without warrant, a thoroughly pessimistic position; the majority were not disposed to hope greatly from surgical interference. It therefore seems not unjustifiable to report the following cases, partly because failures should be reported as well as successes, and partly because they illustrate one or two points of interest.

Kate F., sixteen, single, a nursery-maid, presented herself at the out-patient department of the Boston City Hospital, 17 February, 1890. She was born in Ireland. Her mother had been insane for eight years,

¹ Read 9 November, 1891, before the Boston Society for Medical Improvement.
her older sister was rather nervous; otherwise no hereditary taint could be discovered. The girl herself had always been in good health. The catamenia had been established two years before, and since then had been regular and without disturbance. Five years before coming to the hospital she was struck in the forehead with a stone, and was rendered unconscious by the blow. She was carried to a hospital in Dublin and lay unconscious for three days. She then recovered her senses, but she remained in the hospital for three months. After the injury she had strabismus for a time, but that passed away. Ever since the injury she has been subject to headaches; the pain being referred to both sides of the forehead and to the top of the head, but, as a rule, it starts from the seat of the injury. She has a headache nearly every day, and it lasts several hours. She has also had a slight cough for some time.

In November, 1889, she had a convulsion. There was no aura; the head and eyes turned to the right, and the limbs worked. She frothed at the mouth, could not speak, began to stutter, something came up in the throat and then the head turned and she fell. She said that in some attacks she was conscious of what was going on, but she could not control the attack; in other attacks she lost consciousness. After the first attack she vomited. After the attacks she was sleepy and foolish. A month later, in December, she had a second attack. Since then she has had six more, about one attack a week, the attacks coming on in the morning.

Physical examination showed a stout, sturdy, rosy-cheeked girl with a small stellate cicatrix on the forehead, a little to the left of the median line, about an inch from the beginning of the hair, beneath which was an area of rough, irregular bone with some depression. Careful examination revealed nothing else remarkable. She was given fifteen grains of potassic bromide three times a day, and ordered a restricted diet. This was continued until March 5th, when it was omitted for two days, without orders. No indiscretion in diet was committed. March 9th she had a fit, and March 11th another. On the 11th she had a bad headache and cramps in the stomach. The bromide was ordered to be taken four times a day.

March 13th, she had another fit, and on the 19th another, in which the head and eyes turned to the right. She again, on the 19th, had headache and cramps. She was ordered to take thirty grains of bromide, three times a day.

March 26th, she reported an incomplete attack. The attacks have been preceded by marked vertigo.

April 9th. Three fits since last report.

The bromide having apparently failed to control the fits, I thought it advisable to lose no more time, and I advised her to enter the hospital for operation, which she consented to do, and on the 11th of April she was admitted to Dr. Post's service.

April 13th. Last night and this morning she had convulsions in which the head, eyes and mouth were drawn to the right. She was conscious, but she could not control the attack.

April 21st. She has been kept quiet in bed, and, aside from a slight tonsillitis, she has been comfortable and there has been nothing to attract attention. This morning she had a convolution, followed by another at noon. These convulsions were general, the legs and arms becoming rigid, the muscles of the face and jaw twitching violently. They lasted four or five minutes. The last catamenia ceased a week ago; the convulsions have never been more marked at the menstrual period.
She had now had twenty convulsions, and bromide seemed powerless to control them. In many of them the signal symptom seemed to be turning of the head and eyes to the right. The centre for this movement is the motor centre nearest the seat of the injury. I thought it possible that a discharge, starting from the old wound, might extend first to this centre and then give rise to a general convulsion. The thing to be done was clearly to trephine over the seat of injury, and to remove, if possible, all cicatricial tissue. She was therefore trephined by Dr. Post on the 24th of April, a button of bone was removed, the dura and a portion of adherent brain-substance excised, and as much of the cicatricial tissue as possible was removed. Some thickened connective tissue was left in close proximity to the longitudinal sinus which could not be removed without cutting the sinus; elsewhere all tissue was removed down to healthy brain substance. The details of the operation will be given by Dr. Post.

The patient recovered well from the ether, but she had a little pain at the seat of the operation.

April 25th. Considerable headache this evening. The pupils are equal; the tongue is protruded straight. She was perfectly conscious. Five grains of antipyrine were given at night to relieve the pain.

April 26th. She felt better and had less headache. Her color was good, and she was bright and cheerful.

April 27th. Some headache, relieved by antipyrine.

April 29th. She felt very well, and was found sitting up in bed reading.

April 30th. She was allowed to sit up with blankets about her, but, instead of sitting still, she walked about the ward and talked with the other patients.

May 2d. Wound dressed. Perfect union by first intention. No redness or swelling anywhere about the wound. The stitches were removed and a small moist corrosive sublimate pad applied.

May 7th. General condition excellent. She was actively employed about the ward. No symptoms. Her health appears perfect.

May 9th. This morning she had a convulsion, during which the head became fixed, the eyes were staring, and she frothed at the mouth. There was no twitching. In the afternoon she had another attack in which the face and all four extremities twitched. She was given fifteen grains of potassic bromide three times a day.

May 10th. Two convulsions to-day. The first was not seen until near the close; the second was general.

May 15th. One convolution since last note. Bromide increased to thirty grains.

May 21st. Doing well. Up daily about the ward. General condition excellent. She was put on a milk diet, and she had had no convulsions since the last note.

May 28th. Slight bromide acne. It is almost impossible to restrict the diet. No convulsions.

June 4th. General condition good. One convolution since last note. Bromide increased to forty grains.

June 11th. About ward. Two and one-half minims of Fowler's solution given for acne.

June 18th. No more convulsions.

June 21st. General condition good. Wound firmly united, only a faint white cicatrix remaining. No more convulsions. Discharged; relieved.

She was seen at various times during the summer by Dr. W. N. Bullard, at the out-patient department, and he has told me that the convulsions then continued. She has now disappeared from observation.
Wm. H., eighteen, single, was referred to me by Dr. J. Richard Taylor, of Sag Harbor, 28 April, 1891. His paternal grandfather died of phthisis, his paternal grandmother of apoplexy. His mother is very nervous, one of her sisters died of paralysis, another of meningitis following influenza, a third of phthisis. The patient himself had been healthy until the age of twelve, when one day, while running with his head turned to the left side, he was struck in the right temple by the fist of a young negro who was chasing him. It is uncertain whether the negro had anything in his hand at the time. The boy was dazed for a time, the eye and forehead were badly swollen, but he made a speedy recovery, and went back to school that afternoon. There was no history of indulgence in tobacco, alcohol or venery, and venereal disease was denied.

In less than a year from the time of receiving this blow, the patient began to have seizures of various kinds. The account of the earlier attacks is not very definite. These attacks have increased in frequency. He now has three or four mild seizures a day, or even more, and, at the most, two or three severe seizures a week. He has been two weeks without a severe seizure, but within the last three months he has had forty-five severe seizures.

The severer seizures begin by turning of the head to the left; the left side of the face, the platysma and sterno-mastoid muscles, and the left arm twitch; the neck is more affected than the face. He sometimes bites his tongue, falls, loses consciousness and passes urine involuntarily. His physician reported that all the severer seizures began with a turning of the head to the left, and the left arm was usually affected. He frothed much at the mouth. Two weeks before coming to me, his physician saw him in a fit, in which he lost consciousness, ejected much froth from the mouth, and belched up much gas. In this attack he walked into the next room, came back and asked for medicine, went back and took it, and, as always happens, obeyed all the commands given. On returning to consciousness, three-quarters of an hour later, he had no memory of what had happened, and asked if the doctor had been there. He walked about with his eyes open and with the pupils moderately dilated.

In other attacks the head turns to the left, he froths much at the mouth, and he will take out his handkerchief with both hands in an aimless fashion. He will start and run, usually to the right with the head turned to the left, upstairs, or back and forth from one room to another. Sometimes he will recover promptly, at other times he will fall and have a convolution, with twitching of all the limbs, followed by rigidity. After these attacks he falls into a deep sleep lasting half an hour to two hours.

In other attacks he begins to stare, presses on the abdomen with both hands, and belches up wind. He talks and answers questions intelligently, but he has no memory of what takes place during the attack. As soon as the attack is over he feels and appears well, but if he has them very frequently he is languid and tired after them.

Finally the patient describes lapses of consciousness, lasting only a few seconds and not noticeable by bystanders. In these attacks the head does not turn. In the minor attacks he chews a good deal, but he does not bite his tongue. They are attended with considerable gastric disturbance, and there is much belching of gas after them. There is never any aura; the fits are about as frequent by night as by day.

Recently he has had a feeling of pressure at the seat of his old injury, especially when fatigued. The memory for every-day events is not as good as it used
to be, but the memory for events of some time ago or for book-knowledge is as good as ever. He is very fond of mathematics, but application renders him worse, so that he has given up school and study. He is a trifle more nervous and irritable than formerly. His general health is good, there is little headache and no visual disturbance, and he eats and sleeps well. No thoracic, abdominal or urinary symptoms.

**Physical Examination.**—Well developed, fairly nourished. The skin is thick and pasty, with an abundant fine papular eruption on the face, and to a lesser extent over the body. Mesaticephalic: long diameter, 19.2 cm.; biparietal diameter, 15.2 cm.; cephalic index, 79.16. Glabella to inion, 36 cm.; circumference, 56.7 cm.; measurement from one external auditory meatus to the other over vertex, 37.7 cm. Trococephalic and slightly plagiocephalic. A faint scar, the size of a pea, was seen on the right temple just at the beginning of the hairy scalp; there is a point near it which is sensitive to pressure. Pupils equal, 4 mm. in diameter, reacting to light and convergence. Ocular movements good. Field of vision and color sense normal, $\text{vod} = \frac{3}{4}, \text{vos} = \frac{4}{5}$. Fundus oculi normal. No deafness, tinnitus, earache or otorrhea. Watch heard at five feet, au. Aural examination negative. Mobility and sensibility normal. Knee-jerk and plantar reflex normal. Dynamometer, R. 31, L. 33. Pulse 92-108. Examination of chest, abdomen and urine negative.

Medication had been faithfully tried for years. Hyoscine, hydrobromate and antipyrine had given some benefit, bromide had proved useless, iodide and mercury in small doses had seemed of benefit as a tonic. I agreed with his physician that trephining afforded a chance of relief, and I thought it best to have it done without further delay. He was accord-

ingly admitted to the Boston City Hospital on April 29th.

April 30th. In the afternoon the nurse heard something fall, and found him on the floor with a clonic spasm of all four extremities and of the lower jaw; the spasm was not more marked in any one portion of the body. He frothed at the mouth, and after about two minutes he became rigid and lay in moderate opisthotonos for about three minutes; then he fell into a sound sleep. The head was shaved, the fissures and the tender spot were marked with nitrate of silver, and a corrosive sublimate dressing applied.

May 1st. The tender spot and the scar seemed to be very nearly over the centre for the movements of the head to the opposite side, and this movement was the signal symptom for the majority of the fits. He was, therefore, trephined over that spot by Dr. Post. Almost directly beneath was found a marked bluish white opacity of the pia, but the opacity and oedema extended in every direction under the edges of the trephine opening, so that it was clear that the lesion was diffuse. The details of the operation will be given by Dr. Post.

May 2d. He made a good recovery from the ether, and slept fairly, although he was restless the latter part of the night. In the morning he was comfortable. Temperature 99.5°, pulse 116. In the afternoon he complained of headache and restlessness, and of the tightness of the bandage, which was loosened. Temperature 101°, pulse 132. He was given hydrobromate of hyoscine (gr. $\frac{1}{10}$) at night.


May 4th. Temperature lower. No convulsions.

May 7th. Temperature has not risen again. No headache; good appetite; slightly costive; sleeps well.
May 10th. General condition excellent.
May 13th. Dressing removed. Wound found in perfect condition, healed by first intention. All the stitches, twenty-two in number, were removed. Not a drop of pus was seen. General condition excellent, and he complains of no trouble in the head. Dry dressing.
May 15th. Had a convulsion.
May 20th. No dressing on head now. Yesterday he had four mild convulsions. He became unconscious for a few minutes, pulled at his lip, the pupils dilated, then he came to himself, and fell asleep. Up a few hours yesterday and today.
May 21st. Another convulsion.
May 22d. Discharged. Not relieved.
June 4th. No attacks since May 26th. He has had thirteen since the operation. I saw him in one, which began by turning of the head to the left, and involved the left arm. He was given twenty grains of bromide of sodium and ten minims of fluid extract of cannabis indica, which seemed to control the attacks somewhat. A few days later he returned home.
A letter from Dr. Taylor, of the date 1 November, 1891, gives further information:
"Mr. H. is at home, and I think has not materially improved since the operation. For three weeks after the operation he was apparently well, then had several days (two or three) in which he suffered from slight attacks characterized by temporary loss of consciousness, with profuse flow of saliva and unintelligible muttering and mumbling—each attack lasting from three to five minutes. Between each series there is an interval of ten or twelve days, in which he apparently enjoys very good health. Since the operation he has had ninety slight attacks and four severe convulsive seizures, in which the movements were noted on the left side, involving the muscles on the left side of the neck, chest and left arm. In running away on one occasion, he ran in a circular course to the left. His appetite is very good, the bowels act well, and he rests well, though a light sleeper. He devotes too much time to thinking about his condition, though I keep him busy with out-door pursuits as much as possible. He uses Brown-Séquard's mixture of iodides and bromides and fluid extract of cannabis indica."
These two cases may serve, perhaps, as a text leading to a discussion of the propriety of trephining for traumatic epilepsy. The possible scope of the operation has been extended of late, so that there are now two questions to consider: the propriety of trephining in cases where epilepsy has declared itself, and the propriety of trephining in cases of head injury as a means of preventing epilepsy.
The operative proceedings in cases of epilepsy have been further extended, in that operation is undertaken not only for the elevation of depressed bone, the removal of cicatrices, etc., but also, in Jacksonian epilepsy, for the excision of the apparently intact cortical centre from which the discharge arises.
Excision of the cortex has been done in comparatively few cases, and the results, as a whole, have not been very satisfactory. In several cases, however, temporary relief has been obtained, and in a few cases the fits have not recurred up to date, a period, however, of only two or three years. Even such a limited percentage of success, however, renders the procedure justifiable in severe cases.
Trephining for the purpose of removing depressed fragments, cicatrices, etc., is an operation of much longer standing and of a less serious character. Cases are on record showing relief and even recovery following such an operation so as to render its performance
perfectly justifiable. It may be well, however, to consider some of the factors which render the success of either operation doubtful.

The theory advanced by Hughlings-Jackson, that local irritation of a cortical motor centre may lead to a motor discharge from that centre, and perhaps from others near it, is well known. Following upon it came the corollary to remove the irritation from the centre as a prevention of subsequent motor discharges.

In cases of injury to the head, however, we may have two factors: first, a general commotion of the contents of the cranium, and, second, a local injury of the skull and the brain beneath it. The first factor is always present, the second is not constant.

We know that such a commotio cerebri may give rise to various diffuse structural changes in the brain, and, as a result of such changes we may have epilepsy. It is, moreover, now well-established that partial epilepsy, of the so-called Jacksonian form, may be the result of diffuse changes, of lesions remote from the affected centre, of poisoning, as in uremia, and of various unknown diffuse molecular (?) changes as in true epilepsy and hysteria. Commotion is therefore a possible causal factor in all cases of traumatic epilepsy, and if it be the cause, the removal of any local lesion will be powerless to effect much relief. My second case shows clearly a diffuse lesion, giving rise to partial epilepsy, and due, not improbably to the diffuse, rather than to the local effects of the blow, in what was probably, from its heredity, an invalid brain.

In other cases we may have epilepsy as a result of the local irritation, although, as the general commotion can seldom be excluded, this is less absolutely certain. Granting the fact, however, we find, not infrequently, a history not unlike that of my first case. A fairly healthy brain receives a local injury, and, for a long time, resists its effects. Finally the resistance yields and an epileptic attack follows. In the present case the brain resisted four years and a half. In that period there is time for various secondary processes (inflammatory changes starting from the seat of injury, secondary degenerations of association tracts, etc.), to develop. Hence, by the time the epilepsy has manifested itself, the other diffuse changes are well-advanced. Although the local irritation may be removed soon after the epilepsy appears (after only twenty seizures, as in this case), the secondary changes may keep up the trouble, and the operation may prove futile. With an invalid brain the resistance is less prolonged, there is therefore less time for secondary changes, and the removal of the local irritation may thus give more relief.

It is unfortunately by no means easy to determine how far either one of these factors preponderates in the causation of epilepsy in the individual case, nor can we, as yet, decide whether the trouble be due to general commotion or to local irritation. Hence every operation must be merely tentative, and the result, as follows from what has been said, will always be doubtful and not infrequently negative.

In view of the gloomy prognosis of traumatic epilepsy, even after an operation, the question of preventive treatment by early operation naturally arises. If epilepsy be due to a local irritation, and if that irritation be promptly removed before the secondary changes above referred to have set in, the chances for recovery are naturally much greater. The risks of such an operation are, of course, comparatively slight, although statistics are lacking to enable us to give exact figures. Hence, a year ago, Horsley urged that every fracture of the skull be immediately trephined, and Agnew, at Washington, assented to that view so
far as to urge that every depressed fracture be trephined.

It is certainly justifiable to do much to prevent epilepsy, and in some cases this procedure will probably be successful. Most men to-day, I think would trephine such a case as my first one at once; and, if this had been done, I think the epilepsy would have been prevented. In my second case, however, no one would have thought of trephining, and I doubt if early trephining would have done much good.

We lack information on two important points. The first is how many cases, the second is, what cases of fracture of the skull will be followed by epilepsy. From 1 May, 1882, to 1 January, 1891, 122 cases of fracture of the skull have been discharged relieved from the Boston City Hospital. During the same period 184 new cases of epilepsy have presented themselves for treatment in the out-patient department. These figures have some slight value in showing the relative frequency of the two conditions. I have certainly seen one-third and probably one-half of the epileptics. Of those that I have seen only a small proportion, not over ten per cent., could be regarded as traumatic. My figures are of course vague, but they would lead us to suspect that only a minority of the cases of fractured skull become epileptic.

Dr. J. J. Putnam has recently called attention to the possibility of epilepsy being due to the diffuse changes above referred to, and he has also emphasized the fact that in many cases, even of depressed fracture, the depressed inner table of the skull presents a smooth, rounded surface, which cannot act as a local irritant.

Considering, then, the probability that a general commotio cerebri is a prominent factor in the causation of traumatic epilepsy, that many fractures do not give rise to local irritation, and that, probably, a majority of the cases of fractured skull are never followed by epilepsy, I am disposed to believe that preventive trephining is hardly warranted unless there be distinct cerebral symptoms at the time, which would indicate its performance independently of any consideration as to subsequent epilepsy, or, in other words, that preventive trephining, per se, is not, as yet, justifiable. If we could tell what cases are likely to be followed by epilepsy it might be different, but, as yet, we have no means of deciding upon this point.

SURGICAL DETAILS, BY DR. POST.

It seemed to me, at first, that the operation was so simple that there was nothing to say upon the purely surgical details; but thinking it over a little made me feel that when it had become possible to remove a piece of bone from the skull with a bit of the meninges with an assurance of primary healing without special constitutional disturbance, that there might be something worthy of mention in the methods.

Briefly, the details of the two operations were as follows:

Kate F. entered the hospital on 11 April, 1890. Soon after entering she developed a tonsillitis, and on the 17th the temperature was 101.8°. The operation was done on the 24th; her temperature being normal in the morning of that day, before the operation, and 99° in the evening, after the operation. On the next evening it reached 101.2°, gradually falling from that time, it became normal again on the fourth day.

Preliminary to the operation, the scalp was shaved and cleaned; a semicircular flap with the scar in the centre was cut and turned back; a cicatrix in the bone was exposed, which was included in the trephine button one inch in diameter which was removed.
The bone was unusually thick on one side, and was united to the dura in the centre. When separated, there was slight bleeding from the torn dura. A piece of the membrane, the size of the trephine hole, was cut out, which seemed thickened, and was adherent to the brain beneath. The small adherent portion of brain substance was removed. The wound was irrigated with boracic acid solution and closed with silk sutures, and a baked dressing applied. No drainage-tubes were used.

On the fifth day (29th), the patient was found sitting up in bed and reading. On the sixth, she was allowed to sit up in a chair with blankets, but walked around and gossiped with the other patients.

The trephine button was an exceedingly interesting one. It was, as mentioned, double as thick on one side as on the opposite. On section, it showed a sclerosis of the bone at the point of injury, which entirely obliterated the diploë. A minute canal ran from the outer to the inner surface. The inner face of the bone was as smooth as though it had never been injured. No operation at the time of the injury could have left a smoother surface.

W. L. H., aged nineteen, was operated on 1 May, 1891. His scalp was shaved and thoroughly scrubbed. A semicircular incision was made about the spot previously decided upon. Three buttons, five-eighths of an inch in diameter, were removed and united by bone-forceps, making a hole some two inches in diameter. The bone was rather thin, but there was a troublesome haemorrhage from the diploë, which was most easily controlled by a wax or putty made after a suggestion of Mr. Horsley. The flap was sutured without drainage-tubes, and a dressing was applied of baked gauze, the inner layers of the dressing being moistened with corrosive sublimate solution, 1 to 3000.

On the evening of the third day his temperature was 101.2°, the highest point reached. On the seventh day the record reads, "Temperature has come down steadily. No headache."

On May 13th the dressing was removed for the first time, and the wound was found in a perfect condition. It was entirely healed by first intention. All the stitches, twenty-two in number, were removed without disclosing a drop of pus. His general condition was excellent, and he complained of no trouble in the head.

In both cases the semicircular flap was used, which differs very decidedly from the old crucial incision. It is much easier to control, a single pair of forceps holding it out of the way instead of four, as in the crucial incision. It gives better access to the field of operation, and when the operation is done it covers the wound completely, like the lid over the top of a flask; but its great advantage is the fact that the edges come together perfectly giving a better opportunity for immediate union. Another advantage of the flap is that it allows the raising of the periosteum, with all the soft structures, so that the periosteum is preserved comparatively uninjured, and replaced with ease in its proper position.

Such a flap, like any incision in the scalp, is liable to bleed freely; and if an operation is prolonged, as it was in the first operation where the bit of bone to be removed had sides of very unequal thickness, it is worth while to take some pains to control the loss of blood, which amounts to a good deal in the course of a long operation. With our modern haemostatic arrangements it is comparatively easy, but it is necessary to think a little about wounding the flap, as one is extremely anxious to get first intention. For that purpose I took pains never to clamp the whole thickness of the scalp, but where it was impossible to secure the
artery in any other way, a stitch was taken and tied tightly, compressing the artery in that way, the stitch afterwards being removed, of course.

In enlarging the trephine wound, instead of taking out a second or third trephine button; I prefer to take out a single button, and enlarge the wound with the gouge forceps. It can be done with a pretty thick skull, but hardly possible with a skull of the thickness of the first button I showed.

The putty, suggested by Mr. Horsley, is extremely convenient in controlling the bleeding from the skull itself. It is very desirable to have an unobstructed view of the meninges after the bit of bone has been removed, and by stuffing the bleeding points of the skull with this wax one not only controls the haemorrhage, but secures an unobstructed field.

In closing the wound it seems to me that it can never be necessary to sew together the membranes. It would be a much greater disadvantage to leave a stitch beneath the skull than any possible advantage that could accrue from it.

The replacement of bone after the operation is a question that is sometimes considered. I did not do it in either of these cases, nor in any of the other cases I have trephined for traumatic epilepsy. It seems to me that the object to be attained by the operation is the removal of that bone, and once removed there is no object in replacing it, even if nothing is found beneath it, and I cannot but think there may be an advantage in giving a little extra space for the brain to expand.

I did not put any drainage beneath these flaps, but closed them tightly. I will not say no drainage should ever be used. If a great deal of damage has been done, and one expects considerable haemorrhage or leakage of any sort, drainage may be desirable; but ordinarily speaking, where there has been a clean wound and comparatively little damage done, I prefer to close the wound immediately without any drainage at all. The advantage of no drainage was illustrated particularly in the second case, where the patient went thirteen days without any dressing. Had there been a drainage-tube of any sort, a dressing would certainly have been necessary in a much shorter time. But when I say that these wounds were closed tightly, perhaps I ought to explain that I took pains in these cases to carefully adjust the flap so that first intention was possible everywhere, but at the same time I did omit a stitch or two, so that if there was any oozing or anything that needed to find exit, there would be a weak spot in the suturing where it could find exit more easily. The wounds were then covered closely with a baked dressing that is highly absorbent, so that little vacant space is left to fill with serum, and whatever oozes out is quickly taken up by the dressing.

The subsequent care of the cases was quite simple. I must confess that the second of these cases gave me a little anxiety for a day or two, as he gave me the impression of being quite sick during the time. In the first case the only anxiety was to know how long to keep the girl in bed. She would have been glad to get out of bed the second day, and when she was, with hesitation, permitted to sit up on the fifth day, she surprised us somewhat by running about the ward in the manner that has been mentioned. Whether any possible damage could be done to a patient by getting up and running about too early is a question in my own mind. I kept the girl quiet as long as I could, but at the end of a week she was practically beyond control. The young man I kept in bed much longer,
with the intention that if there was any advantage to be gained from quiet after the operation, he should have it.

The danger of the operation seems to be very slight indeed. I suppose it would be the common feeling of all surgeons at present that while no operation should be done unnecessarily, there is practically no more danger in trephining an adult in good health than in going through the soft parts.