shirt; three or four bandages are now placed in water; one of these is wound snugly around the body just above the crest of the ileum, making two or three turns, then the hips are enveloped down to the great trochanter,—use one or two bandages at this point. Begin at the bottom of the corset each time, and roll on the bandages up to the arm-pits, rubbing each layer until there is no longer air in the meshes of the cloth. Six bandages will do for a child under 7 years. From eight to twelve for adults. When the plaster is setting, stand behind the patient and gently crowd the corset in over the crest of the ileum and firmly against the ribs. After the corset has firmly set, remove the dinner-pad and spring the corset antero-posterior, to throw it off the antero-posterior spinous process, otherwise excoriations will surely follow. Cut the corset off at the bottom and top; leave it on permanently in case of Pott's disease. In lateral curvature cut off the corset, trim the edges with lacing, and you have an elastic, light and durable spinal brace.

If the patient desires a wood corset, fill the plaster-of-Paris corset with plaster, which makes a cast of the body, upon which the wood corset is made.

The corset in Pott's disease should be worn from six months to a year without removal. In lateral curvature it should be removed each night. Proper exercise, forcible redressment, gymnastics and so on, as already mentioned, should be used.

If an aluminium corset is desired the plaster-of-Paris cast is sent to the foundry, the anvil is made, and upon this the aluminium is worked. This undoubtedly is the most beautiful corset made.

I wish to present to you a case of club-foot operated upon by Phelps' method. Before the operation the child walked on the outside of his feet. You see now the feet are as perfect as it is possible to make them. The child walks almost perfectly, with nearly perfect motion of every articulation of the foot. Some have criticised the operation by saying that paralysis and a sensitive scar is the result. I think I can now speak authoritatively, because I have operated over three hundred times and I have not observed either. I have seen some feet which, from bad shoeing, after years have resulted in a moderately flat foot, but not enough to inconvenience the patient. This case had been treated in the Fifty-ninth Street Dispensary for four years with braces, and the result was entirely unsatisfactory. Three months ago we performed this operation making this simple cut, as you see, through which we divided everything contracted, and forced the bones into their normal position, and the foot into the super-corrected position. The child wears the plaster-of-Paris shoe, which extends a little over the ankle, over which an ordinary shoe is worn. This will be continued for one year when, as a rule, these cases have passed the period of relapse. I consider it bad practice to treat any case of club-foot for years with any form of brace when the patient will allow us to operate. The results are not so good as when following this operation.

One word more, and then I have done. No case of club-foot should be operated upon by any form of osteotomy until subcutaneous tenotomy and open incision with great force has been employed. After this, the various forms of osteotomy find their place. In my series of nearly three hundred cases, osteotomy has been necessary in nearly 12 per cent. of all the

cases, and in nearly all of these three hundred cases, operations of various kinds or prolonged instrumental work had been employed. Several of them had had the astragalus removed. Others had had cuneiform resections performed. But with this small cut that you see and dividing the contracted soft parts, all of these feet were placed in the super-corrected position, with the exception of 12 per cent. It is true, great force was required in many of them.

NOTE.—In this series of 300 operations if we had resorted to osteotomy there would have been twelve funerals, as the mortality from osteotomies is about 4 per cent.

40 West 34th Street, New York.

CRANIOTOMY IN MICROCEPHALUS.

Lecture delivered to the Post-Graduate Medical School, Chicago, 1893.

BY CARL BECK, M.D.

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The era of aseptic surgery has not only brought about important changes of old operative methods and simplified our surgical apparatus, but it has also given a stimulus to bold undertakings in surgery.

A large group of operations, which we could designate with the collective name of plastic operations, in the broad sense of the word, and which have the ideal purpose to correct the errors and faulty works of nature, have made an immense progress; but not only the common malformations as cleft palate, congenital dislocations, etc., have been attacked surgically, but the most delicate organ of the human body, the brain, has been a field of speculation by surgeons. Malformations and retarded development, mental disturbances of many kinds were considered and subjected to surgical experiments, and many of these experiments proved to be a success. But as it always happens in such instances, the use of these operations was extended over cases that were quite different from those for which they originally were indicated, and so it came that the operation seems to be discredited in the opinion of many conservative and even progressive men of our science.

The French surgeon, Lannelongue, first tried to operate on an idiotic microcephalic child, and he called the operation craniectomy. It was an operation designed to relieve the brain of the child of the restraining pressure from a prematurely ossified skull, by removing a strip of the skull capsule and allowing the brain to develop. The plan was based on hypothetic grounds entirely and on wrong suppositions partly, but it was successful, and though nobody could exactly explain the success, this latter was an undeniable fact and sanctioned the undertaking. The experiment was carried out time and time again, by truthful and scientific men, but with various results, and caused on the one hand an unjustified enthusiasm; on the other a sad disappointment.

Whoever reads the following expressions of authorities—and both men whom I am going to quote, are authorities recognized in the world of science—does not know whom to believe. Verneuil, the great French surgeon, who has witnessed the results of Lannelongue's cases, adds to the paper of this author, which he presented before the Academy of Medicine of Paris, the following remarks: "I call the attention of the members of the Academy to an entirely new operation that gives the greatest honor to the distinguished surgeon who has inaugurated it and carried

it out with success. We have not to deal here with an empiric task undertaken by chance (*tentative faite au hasard*), neither with a human vivisection which is done too often nowadays. The resection of a piece of the cranial skull for microcephalus is a perfectly reasonable idea inspired by the anatomy and pathologic physiology, and it has, as it was *a priori* to be expected, given a remarkable result. Undoubtedly the undertaking seems to be bold and will remain so, but it is less rash if we consider the benignity of operations in children, the simplicity of our operative apparatus, and above all the extreme broadness which the practice of antisepsis allows to our surgical undertakings. I have seen the little girl this morning myself, and I have examined another child who has recently undergone the same operation. Both are doing marvelously well. From to-day on, we can count on the operative success of the craniectomy as M. Lannelongue has performed it. As to the therapeutic success the future will decide, and besides the last word is not yet spoken about the technique and the improvements that can be brought about."

This critique, of Verneuil's, an authority of high rank is very flattering.

One year afterwards we read Bourneville, an authority in nervous diseases and hear to our surprise:

"Generally speaking it seems to me that the surgeons have little knowledge about idiocy in its various forms. We find as reasons for undertaking such an operation as craniectomy the following: The condition of this child is so deplorable, that there is hardly a risk to undertake any operation at all, which gives a chance for relief (Wyeth) and another: As far as I think, it is a very lucky invention, for if we can not help such children it is better for them to die than to live such a miserable existence. (Keen). These are surgical views *fin de siècle*. We have to condemn them. The medicine we were taught, has the mission to cure, to better or relieve the sick that are trusted to us and not to assume the function of an executioner. If there is a law from the social standpoint, that orders to kill all idiots it is not our business as physicians; leave this to the public executioner. But there is no such law. The physicians have always tried to ameliorate the physical and moral conditions of the idiots and imbeciles. The surgeons ought to visit the institutions for these unfortunates in the United States and in England, and see how these poor human beings are educated. They ought to read what is published about the pathology of these disturbances and they will be convinced that their action is not justified in a large number of cases."

Reading two such entirely opposite views on one subject, we are apt to be at a loss as to what to do. So it was with me when I first met a case that I thought belonged to this class of malformations. I undertook it to study up on this question to the fullest extent, and the fruit of these studies is the following paper.

In going at the subject I had to study the literature, which is quite extensive, for the pathologic part of it was a well-known matter of controversies and discussions and has accumulated an extensive literature from very competent and diligent observers; and the literature on the therapeutic measures has assumed large proportions since Lannelongue's publication. To this I had a modest experience of my own. I thought to make this a critique of what has

been done, gathering the single observations and calculating what may be done in the future. There are several questions to be answered:

1. What is microcephalus?
2. What is craniectomy?
3. What is the possible physiologic connection between one and the other?
4. What was done so far, and how were the results?
5. What are our objective conclusions in regard to the advisability and outlines of indications for the operation?

From what I read in the respective articles, it would seem that microcephalus is a type as strongly and well defined as any pathologic condition, for instance cleft palate, but this is not so. There is a chaos of pathologic views and facts are thrown together with so many hypotheses and symptoms that it is hard to form an opinion about the true pathology of this malformation. Historically the question and investigation developed as follows: The large group of idiotic individuals showed that there were some of that kind whose heads even to the non-scientist appeared as too small, and the small size of the head was accused as the cause of the idiocy. Darwin's theory, which brought about so many changes in our thoughts in regard to the development and relations of different classes of animals has brought the microcephalus question to the foreground. In the development from the highest animal, the monkey, to man, there seemed to be a gap, which to fill, the lowest human being, the Bushman of Middle Africa, seemed to fail. Here some interpreters of natural development found that the microcephalus—the homo animal *Blumenbachii*—was the right individual to fill that gap, and scientific men argued pro and con in hot discussion. Men like Gratiolet, Rudolf Wagner, Sander and others sought to prove the contrary, but Carl Vogt, who wrote the most extensive paper on microcephalus, has scientifically developed the theory of the descendance of microcephalus. He measured the surface of the brain, covering it with stanniol paper and then measuring the same, he weighed the brains, he compared the brains of microcephalus with those of monkeys, the details of which would lead too far—and he seemed to prove that we have atavistic forms in our microcephalic individuals and that they form the link between the monkeys and human beings. These assertions brought the microcephalus into discussion. But Wagner as well as Vogt had not studied on good pathologic material and they did not base their studies as well on pathologic facts as scientists could with all improved methods of examination during our latest time. Giacomini, of Torino, is one of the latest authors who gave a comprehensive study on this subject. He points out that among the microcephali there have been counted many different varieties of cases, some, where there was no brain (Starr's case), which ought to be classed as anencephalus, and others where the brain weighed 950 grams (Krause); such a case comes near the normal. But it is not right to classify the degrees of microcephalus by the size of the skull or brain, because this simply gives relations and nothing else. The central nervous system is the main indicator. Two questions arise to the author: Is microcephalus a type and can it be explained by the theory of descendance?

Giacomini had rich material in the museum of

the Anatomical Institute of Torino. Of his two predecessors who wrote about this question, one had only one brain at his disposal (Rudolf Wagner—microcephalus of Iena), and the other none at all, but only plaster-of-Paris casts of skulls and brains (Carl Vogt). Giacomini observed eighteen cases and examined the bodies carefully. They ranged from 7 to 66 years in age; the brain weighed from 171 to 968 grams. There existed no type, no typical microcephalic brain, but as many different microcephali as there were different brains. This uncertainty of symptoms causes the absence of a typical microcephalus, and as there are no points of distinction there is no grouping and no classifying. Weight and capacity of the brain have nothing to do with the abnormality and they have to be discarded as points of division. The impossibility to deduct conclusions of the higher intelligence of normal individuals by the size of their heads prevents us also from forming an opinion regarding abnormal individuals, but the relative weight of different parts of the brain is of more importance because of the harmony of the development. To diagnose a case of microcephalus proper, it is essential that pathologic conditions or brain lesions be absent; microcephali with pathologic conditions are designated pseudo-microcephali. For instance, if a brain is smaller because of porencephaly, or hydrocephalus chronicus internus, or sclerosis, it is a morbid condition and not a congenital disturbance.

As to the etiology of the microcephalus proper, there have been several theories:

1. The atavistic or descendance theory, that is the theory that the history of the development of the single species is repeated in the history of the embryonal life of the newborn, and that this newborn can with one leap take the shape and form of its representative. (Charles Vogt.)

2. The theory of arrested development, which means that the development of the individual regarding brain and skull, suddenly stops during the embryonal life on account of some impediment, and from that point on remains at that stage of development all the rest of the life. (Wagner, Gratiolet.)

3. The theory of premature ossification of sutures and fontanelles and the consequent pressure of the brain. This theory has been supported by none less than Virchow and has overshadowed so much any other that it is hard to part with it. In fact, it seemed to be the most probable and least difficult to understand, and this is the theory upon which the plan of our surgeons was built though indirectly. Nevertheless, this hypothesis is to be rejected and even Virchow and Lannelongue gave it up as untrue. The reasons for this are manifold. First we do not find this premature closure of sutures in all cases of microcephalus. Carl Vogt, who has studied forty-two cases of microcephalus and whose work on this subject has received the Godard prize from the Academy of Paris, found the sutures perfectly open in three cases of young microcephali, and not quite ossified in seven adults. Dr. John von Mierjewski, of St. Petersburg, examined a splendid case of microcephalus of a fullgrown man (Mottey) and found the sutures grown together only partially. Besides this, other authors have made the same observation, while in many other cases the ossification was perfect. But Giacomini points out another reason for the improbability of this hypothesis and that is, that

there exists some smallness of the spinal cord and medulla oblongata with every true case of microcephalus, but at the same time a normal canal for these centers. Why is this, if the ossification of the sutures is primary and the microcephalus secondary?

4. Hydrocephalus chronicus internus has been accused by some authors of causing the abnormality, but inasmuch as Giacomini in none of his cases has found such a pathologic condition this theory can *similariter* be discarded.

5. Smallness of the carotid foramine which prevent the blood from giving enough nutrition to the respective tissues, has been another theory favored somewhat, but it shares the fate of the last one because of the coëxistence of the micromyelia, while the circulation of the spine is not impeded and the spine nevertheless affected.

6. It remains, therefore, only the agenesia cerebri; that is, the opinion which is upheld mostly by Giacomini and which I think is correct, that the microcephalus is of purely central origin; that there exists an arrest of development of the brain and spinal cord, where all the constituent parts are less developed. The cylindraxes of the nerves are smaller in number and size, the convolutions are smaller (microgyria), *en tout* the brain is only a model of the real one—a brain *en échelle réduite*. This is the true microcephalus; all other forms are combined.

For instance, in my second case, in which I was able to do a careful anatomic examination, I found that I had to deal with a microcephalus with enormously enlarged ventricles, so that when the fluid had escaped the shell of the brain collapsed and folded in on some points, like the occipital region, as it can be readily seen on the specimen. This was a case of microcephalus combined with hydrocephalus chronicus internus.

The conclusions about microcephalus briefly we would say are:

- a. Microcephalus is essentially an agenesia of the central nervous system.

- b. Deformity of the skull is the consequence of the same.

- c. There is always micromyelia co-existing.

- d. The agenesia can start at any period of the embryonal life.

- e. Pathologic changes can occur at the same time. (Giacomini).

The symptoms of microcephaly are as different as the representatives of the abnormality. They attracted the attention of the anthropologists first. Blumenbach called them human animals, because they were similar in their actions to monkeys with the expression of human beings in their faces. In psychologic respects they were not similar one to the other; one is active and agile, very skilful in climbing up a tree, with physical strength, an active and expressive mimic in the face. Others are awkward, walk lazily and interruptedly, with very feeble mind, but they understand everything belonging to the necessities of their life, have some combination and can talk some words. Others can not talk at all. Physically they have a splendid healthy appearance, their sexual qualities being not developed at all or being developed to more than usual vivacity (Weise and Schüttendreyer, two cases of Charles Vogt).

But if we look at the table that I have prepared, we do not find these symptoms mentioned in the respective cases and we must ask ourselves, why?

The cases which have been operated show almost idiocy of the lowest kind, and only a few cases are imbecile individuals of the character mentioned above. They have the symptoms; they can not walk, nor talk, can not even sit, must be fed, do not pay any attention to what is going on around them. They belong to great extent to the early youth and infancy, where many of the first mentioned symptoms can not be developed yet at all.

But there is one important point which seems to me to have great weight as to the practicability of the operation, and that is whether the symptoms existed since birth or began to develop later on. Some of the most striking results as in Case 11, of the table, are obtained in the cases, where symptoms appeared after a period of apparently normal development elapsed. We will refer to this point later on more emphatically.

The prognosis of the microcephalic idiot up to late years was very *triste*, and has not gained very much yet by the operation. Nothing could be done very often for them, and all that was done was to educate them. Lannelongue introduced the surgical treatment, the craniectomy.

What is craniectomy? Etymologically the operation consists in removal of the cranium, as thyroidectomy consists in the removal of the thyroid gland. Keen finds this illogical and suggests the term craniotomy, but this is insufficient, as well because it does not indicate the removal of the strip, but the incision only. We will use therefore the term, craniectomy, as do most of the writers.

Lannelongue first removed a longitudinal or antero-posterior strip on one side of the skull. Since that time the operation has been modified many times. The strip has not been made exactly longitudinal but curved. There has been taken out a parallel strip on the other side of the skull (double craniectomy). The two strips have been combined by a third one, crossing the skull, so that we distinguish a V-, U-, and H-shaped craniectomy. The preparations for this operation are as usual for brain operations. The head is shaved thoroughly the evening previous, washed and covered with an antiseptic dressing. The anesthetics are administered very carefully as there are cases of shock on record. The skull is exposed by an incision of skin and periosteum according to the plan of the operation. Some surgeons remove the periosteum over the strip of bone that is to be taken away, in order to prevent the formation of bone at the place of the removed strip, but in most of the cases the formation of bone failed to appear even when the periosteum was left. The first incision into the skull generally is made with the trephine and then the excision is continued both sides of the hole with a special forceps. I have used a modification of Luer's double cutting forceps. Care has to be taken not to lacerate the dura mater which is likely to happen in crossing the sutures. The dura mater has to be freed first from the bone, which can expediently be done by one of the blades of the *rougeur*. As much care has to be taken not to lacerate the venous sinuses.

In most of the cases this has been sufficient to complete the craniectomy, and the purpose has been regarded as fulfilled; in others, the dura has been opened and pathologic products as cysts, hematomata or tumors have been removed. But this latter operation does not belong to craniectomy. There is no drainage used, except the dura had been opened

and the serum had to be drained off. The dressings are as usual. The hemorrhage is usually slight and can be checked by pressure and ligature. Esmarch's bandage is very effective to check excessive hemorrhage.

What are the consequences of the operation immediately after?

The operative result is, if the operation has been done aseptically, a good one; primary union usually. Does the skull enlarge any? Some observers have noticed such an enlargement and given it in figures (Ransohoff and others, see table). Unless the incision is very long if longitudinal, or if the incision is curved, so that it forms a flap on one side (V-shaped or U-shaped craniectomy) there is no possibility of enlargement of the skull. If we compare the skull to a firm globe, of which a strip has been taken out, we can see readily that the cavity of the globe can not enlarge much, if the incision is not very long and the coherent part is similar in its action to an elastic *charnière-joint*. So it is with the skull, and the conclusion is therefore, that the incision must be very long in order to be effective. Such a strip would go from above the eyes down to the occiput. The linear craniectomy is therefore without value even if very long, and only the curved incisions whether single or better, double, are to be considered as able to enlarge the cavity of the skull. The figures that have been recorded, as proofs of the enlargement can not be taken in earnest, for the measures of an eighth of an inch in such cases can be brought about by other causes than the enlargement of the cranial cavity. The bone does not re-appear on the place where it was taken out. Sometimes the dura bulges out and shows clearly that there is a hyperpressure on the cranial contents.

So far extends the operative result, and it is in most cases very good. What is the curative result? This question I shall answer after having recorded the cases.

Now, is there any reasonable causal connection between such an operation as the craniectomy and the abnormality for which it has been used—the microcephalus? and is it justified to extend the operation over other non-microcephalic cases of idiocy, as it has been done in some instances?

As I stated in the first few lines, Lannelongue has used the operation to enlarge the head, though he knew that the premature ossification of the sutures had nothing to do with the arrested development of the brain. He simply thought that the opening in the skull should give an impulse to the brain, and so it seemed really to happen. We may say the connection is as follows: Microcephalus is of central nervous origin; premature ossification of the sutures is only a consequence of the arrested development, but afterwards this prematurely ossified skull prevents the brain from developing and so we arrive at a *circulus vitiosus*, where the cause becomes the consequence and the consequence the cause. If we take out one link of that vicious circle, we have broken that circle and the brain can develop again. We see that it is not absurd to make a craniectomy for the development of the brain, but must not think it verbally true that we free the imprisoned brain by that operation.

But how is it to be explained that the operation was a success in cases of non microcephalic idiocy? If we review the single examples in which it was

performed, we find that the inaugurator himself has enlarged very much the field of indications.

In his paper about this matter read before the Congress of French Surgeons, 1891, Lannelongue says that he thinks that the premature ossification is only a morbid state of the bones due to hereditary syphilis, alcoholism and rachitis, just as well as the rest of the pathologic changes of the brain, partial sclerosis, hydrocephalus, etc. Even in cases where no ossification of sutures took place, there are pathologic changes to be found as too narrow fontanelles or sutures, partial obliteration, the bones thickened. These symptoms Lannelongue found in three microcephalic skulls, which he had chanced to examine, and these symptoms led him to make such cases, if they even were not quite typical, indications for craniectomy. They belonged to the series of pathologic subjects of arrested development and the operation seemed to be successful. He therefore puts down the following indications:

1. Primitive lesions of the brain, which are not recognized by us very early, because the functions of the brain surface are not developed in early infancy, but in later periods.

2. Secondary (*tardifs*) lesions, which occur at the age between 4 to 6 years, and are consequences of diseases, entero-catarrh, whooping cough, erysipelas, etc.

3. Traumatic influences (during birth). It is not certain, whether a part of the idiocy is not due to such a compression during delivery.

4. Congenital affections as described by Lannelongue and Ménard (*Maladies des Bourgeons de l'Embryon*, 1891), the intra-uterine compression on account of lack of waters. This compression is to be distinguished from that caused by delivery in this way, that the diameter is not shorter in one and longer in another direction by compensation, as after childbirth, but that it is smaller in all directions.

5. Meningeal hemorrhages, occurring during birth and consecutive pathymeningitis, atrophies and porencephalies—in other cases there is some serous accumulation and the opening of the skull will remove it quicker.

6. Hyperostoses of the skull caused by syphilis; then the thickening of the skull consecutive to hydrocephaly.

7. Pathologic changes of the brain itself; that is, atrophies caused by mal-development on account of bad circulation; in this case the opening of the skull will bring a new relaxation, an increased conflux of blood and better development.

8. Furthermore, in cases of limited or general sclerosis, well known in the adult, which Bourneville has studied and described under the name of *sclérose cérébrale tubéreuse hypertrophique*.

The fact is undeniable, it was useful to remove a strip of the cranium; but what the causal connection between operation and result may be can not be stated with exactness.

I should think that the following process takes place: Physiologically the fontanelles and sutures gradually ossify and are perfectly solid at an advanced age. If the brain stops developing further at an early age the sutures ossify as in old age; but if the brain is freed by an operation, a new conflux of blood and a new impulse of development occur, and if this new growth keeps on and is aided by the

pedagogical method then the child improves and keeps on improving. But in some cases the operation does not help or it helps only for a time, and then the child falls back to the old condition of idiocy; in these cases the development and improvement seems to be comparable to the nearly burnt out coal, that flashes up once more if blown into, though the material is burned up, and then dies out altogether.

(To be continued.)

A CASE OF SINGULTUS TREATED SUCCESSFULLY WITH NITRO-GLYCERIN.

BY E. GRISWOLD, M.D.

SHARON, PA.

This troublesome spasmodic condition, whether we term it a disease, or only a symptom, may well be classed as one of the *opprobria medicorum*; presenting as it does in its clinical history the appearance of a spasmodic disease, and in its therapeutics almost negative results as regards the action of antispasmodics and nerve sedatives, the practitioner may well inquire after a new explanation of its pathology and a new departure in its treatment. Most practitioners of large experience have doubtless met with cases in which this singularly annoying and debilitating condition has continued for many days, even running into weeks, in spite of their best therapeutic efforts, with scarcely any intermissions, unless asleep, and which sleep came but seldom and was transient. Any new remedy or any old remedy whose successful application to the treatment of this condition is new, deserves the attention of the profession.

There are some things in pathology and in practical medicine that science, so far as we have been able to apply it to our professional work, has not made clear. We are obliged to work experimentally in cloudy fields. When therefore experiment meets with success in an individual case we should follow its line until we discover whether or not the success is a coincidence or a result. Inasmuch, however, as opportunities are rare for carrying on such experiments, I desire to report my result (or coincidence) and to ask the profession at large to try the remedy and do likewise.

On August 2, ultimo, a man aged 50, who formerly had been a habitual drinker for many years, asked advice. He was haggard, despondent and discouraged. His tongue was coated, voice feeble and pulse frequent and weak. His mind, however, was tolerably clear but a little sluggish. He hiccupped continuously, but managed with considerable effort to give the following history:

For nearly two years he had abstained, by the aid of the *pledge* made to his confessor. Six weeks previously he had begun a drinking debauch which he continued for about three weeks, when his stomach gave way and his bodily functions became generally perverted. Hiccoughs were now added to insomnia and he sought medical relief. He could only get a little sleep and an arrest of the hiccoughs when deeply under the influence of morphia; but the sleep was transient and the hiccoughs returned as soon as he awoke. He felt far more disturbed by the hiccoughs than the insomnia, and had taken prescriptions from several physicians without relief. Believing that he had already taken all the ordinary remedies, and knowing their uncertainty and inefficiency from former experience, an excursion through the *mental materia medica* for a new one was made, which resulted in the following prescription:

R. Pill nitro-glycerin 1-150 gr. No. xii. Sig.: One pill at intervals of 3 hours.

The first was taken at 9 A.M. In half an hour the hiccoughs ceased. At 12 M. he took the second pill and some cabbage soup. Shortly after finishing the soup the hiccoughs re-