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John Sloan's

SURGICAL REPORTS,

AND

MISCELLANEOUS PAPERS

ON

MEDICAL SUBJECTS.

BY

GEO. HAYWARD, M.D.,

PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY; FELLOW OF THE AMERICAN ACADEMY OF ARTS AND SCIENCES; LATE PROFESSOR OF SURGERY IN HARVARD UNIVERSITY, AND ONE OF THE CONSULTING SURGEONS TO THE MASSACHUSETTS GENERAL HOSPITAL.

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TO

MY FORMER PUPILS,

This Volume

IS RESPECTFULLY AND AFFECTIONATELY

DEDICATED,

BY

THE AUTHOR.

PREFACE.

NEARLY all the papers in this volume have been printed before. They are now collected from a belief that some of them would be useful from the facts and tables they contain, and in the hope that all might be read with advantage by students and the younger members of the profession. It was even thought that they would perhaps be occasionally consulted by those somewhat advanced in practice, whose time was too much occupied to allow an examination of more extended works on the subjects of which they treat.

At any rate, their revision and arrangement for the press have enabled me to review a professional life of forty years' continuance, and thus furnished an agreeable occupation at a time when I did not feel capable of much mental effort.

BOSTON, *March*, 1855.

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REPORT

OF THE SURGICAL CASES AND OPERATIONS THAT OCCURRED IN THE MASSACHUSETTS GENERAL HOSPITAL, FROM MAY 12, 1837, TO MAY 12, 1838.*

In consequence of the absence in Europe of my respected colleague, John C. Warren, M.D., the surgical department of the Massachusetts General Hospital has been under my exclusive care during the past year. The number of patients and operations has not varied materially from that of former years, nor has there been any essential difference in the character of the diseases that have come under treatment.

A report, therefore, of all the cases, will enable any one,

* Since the following report was written, great changes have been made at the hospital. There were then but two surgeons; there are now six.

The main building has been enlarged so that it can accommodate one hundred and fifty patients; and during the last year an additional building has been erected, containing twenty-four beds, for the reception of those patients who are afflicted with contagious, loathsome, or offensive diseases, and who could not, of course, with propriety, be placed in the common wards of the hospital.

March, 1855.

who will give himself the trouble to examine it, to form a tolerably just notion of the kind of diseases that are usually met with in the surgical department of this institution.

It may, perhaps, be well to observe that the hospital cannot conveniently accommodate more than sixty patients. The average number is a little more than fifty ; about half of these are medical, and the rest surgical. There are from twenty to thirty free patients ; the others pay various prices, according to the apartments they occupy, the lowest sum being three dollars a week.

The number of operations is large, in proportion to the number of patients ; as many persons resort to the hospital, from various parts of New England, for the purpose of undergoing operations.

When I entered on my duties at the hospital, May 12th, 1837, there were twenty-seven surgical patients in the house, and one hundred and ninety-five were admitted during the year, making a total of two hundred and twenty-two. Of these, there were

Discharged as well	86
Much relieved	40
Relieved	38
Not relieved	22
Died	13
Unfit	3
Eloped	1
Transferred to the Physician	2
Remaining in the house May 12th, 1838	17
	222

Of the thirteen deaths, it should be observed that ten of them were the result of violent injury; six of the patients died within twenty-four hours of the accident, and

the other four lingered from five to eighteen days. Of the three other fatal cases, one was from an affection of the lungs. The patient had undergone an operation for the removal of the breast, by Dr. Warren, in April. The wound, however, had entirely healed. Another died of fungus hæmatodes within the abdomen; and the other of phthisis, having been admitted on account of scrofulous ulcers in the neck.

It may well be doubted whether it is proper to swell the bill of mortality of the hospital, by including in it those who die almost immediately upon admission. They have not at any time been patients of the house, as they are altogether beyond the reach of art when they enter. Of the six of whom I spoke above as dying within twenty-four hours, scarcely one of them was able to swallow after his entrance. By including them among the patients who have died at the hospital, it gives an exaggerated notion of the mortality that occurs there.

The following table shows the diseases and injuries with which the patients were afflicted who were in the surgical department of the hospital during the last year. It will probably be perceived by this that the number of cases exceeded, somewhat, the number of patients. This is to be accounted for, in part, by the fact that a few out-patients are included in the table; but more from the circumstance that some persons, who were admitted on account of one disease, became affected with another while in the hospital. This was the case with the eight individuals who had erysipelas, and the two who had eczema. The difference, however, is not important, as there were only sixteen more cases than there were patients, and ten of these were of the two diseases just named.

List of Surgical Cases under treatment during the year commencing May 12, 1837, and ending May 12, 1838.

Abscess	7	Fractures of ribs	3
" lumbar	2	" thigh	6
Ankle, scrofulous disease of	3	" patella	1
Ascites	1	" leg, simple	10
Burn	2	" " comp. and com.	7
Cancer of breast	7	" both legs, comp. and comminuted	1
" face	1	" toes, comp. and com.	1
" mouth	1	Fungus hæmatodes of antrum	1
" tongue	2	" " on abdomen	1
Cataract	1	" " of breast	1
Contusion	4	" " muscles in pelvis	1
" of hip-joint	2	Gonorrhœa	2
Calculus, biliary, with fistulous opening near umbilicus	1	Gryposis, or inverted toe-nail	1
Conjunctivitis, purulent	1	Hare-lip	1
Deformity from accident	1	Hemiplegia	1
" " rheumatism	1	Hemorrhoids, internal and external	3
Dislocation of shoulder	1	Hip disease	6
" ankle	2	Hydrocele	1
Eczema	2	Hernia, femoral	1
Erysipelas	8	Inflammation, local	4
Fissure of palate	1	" of periosteum	1
" rectum	1	" muc. membr. of bladder	1
Fistula in ano	5	" hernial sac	3
" of urethra	2	" do. (sloughing)	1
Fractures of cranium	2	Injury, general, from accident	3
" lower jaw, simple	2	" " " gunpowder	2
" " compound	4	" " " frost	1
" clavicle	1	Iritis, idiopathic	1
" spine	2	" syphilitic	3
" humerus	2	" chronic	1
" olecranon	1	Irritable breasts	1
" ulna	1		
" hand, compound and commin.	1		

Knee-joint, disease of	8
Mercurial sore mouth	1
Necrosis of cranium, with epilepsy	1
Necrosis of elbow-joint	1
Nævus maternus	1
Neuralgia	3
Opacity of cornea	1
Paraplegia from injury	1
" following dysentery	1
Paronychia	1
Polypus of the nose	1
Prolapsus ani	2
Prostate gland, disease of	2
Retina, morbid sensibility of	1
Scrofula of nose	1
" lip	2
" glands in neck	3
" " groin	2
" joints	1
Shoulder, disease of	1
Sprain of wrist	1
Submaxillary gland enlarged	1
Spine, disease of	1
Syphilis	4
Testicle, swelled	4
" medullary sarcoma of	1
Tinea ciliaris	2
Tumors, various kinds	4
" ovarian	1
" hydatid of breast	1
" chronic mammary	2
" encysted over patella	1
" blue, of sclerotica	1
Ulcers, various	9
" scrofulous	3
" varicose, with var. veins	4
" of throat	1
" of the cornea	1
Varicose veins	1
Wounds, lacerated	3
" contused	6
" punctured	3
Wrist, inflammation of	1

On some of these cases I shall offer a few remarks.

Erysipelas. — Only eight cases of this disease occurred in the surgical department of the hospital during the year, and all of them terminated favorably. There has probably not been another year, within the last twelve, in which there has not been a death in the hospital from erysipelas. It has been, and still continues to be, a great annoyance. It frequently attacks patients after surgical operations, and those who have suffered from accident, and very often assumes a malignant form.

We are left to conjecture as to its cause. It cannot be from want of cleanliness, for our institution may safely

challenge a comparison, in this respect, with any other of the same kind, either in Europe or this country.

It seems, however, to be certain that the exhalations from the bodies of sick persons, when a number are confined in the same apartment, are capable of producing an atmosphere that will generate the disease, without changing, in the slightest degree, the sensible qualities of the air. I have been led to believe, by observation to some extent on the subject, that this atmosphere was much more readily produced by those patients who had large suppurating surfaces, than by others, who were not affected in this way.

Admitting this to be true, — and of its truth I think there can be no doubt, — the obvious dictate of common sense is to change the air in the wards of the hospital as often as possible, so as to substitute pure air for that which has been contaminated. This is not so easily effected as at first it might seem to be. It is difficult to do it in the spring and autumn, when the weather is sufficiently mild to enable us to dispense with fires, but at the same time so cool as to require the windows to be closed at night. It is also difficult in winter, without the consumption of a large quantity of fuel; and probably the best ventilator is an old-fashioned open fireplace, but every one knows that it is not the most economical mode of warming a room. There can hardly be a doubt that erysipelas is much more common in those hospitals that are warmed by furnaces, than in those that are not. The fire is usually allowed to go down at night, the ventilator is frequently closed to keep the apartment agreeably warm, and consequently the patients must inhale for several hours the foul air.

This may not be true in all institutions that are warmed in this way: but it certainly was in the Massachusetts

General Hospital. A change in this respect was made the last autumn; the ventilators are now so arranged that they cannot be closed by the patients or nurses; and, to render the ventilation more perfect, the upper panels of the doors of each ward, communicating with the entries, which are not warmed by artificial heat, were removed, and the holes thus made kept open during the winter. Not a death from erysipelas has occurred in the hospital since this change has been made, nor has the disease during the last year been of the formidable character which it frequently assumes. More extensive observation, however, is necessary to determine whether this favorable change is owing to the cause to which I have just alluded.

A moist atmosphere is also supposed by some to be favorable to the production of erysipelas. It has been thought to be more common and more malignant in those hospitals in which the floors are frequently washed, than in those in which they are kept clean by dry rubbing. The moisture may have an effect in diffusing the miasmata, and perhaps rendering them active, when they might have been harmless in a dry atmosphere. The floors of the wards of the Massachusetts General Hospital are daily washed, and the air is often more moist than is agreeable.

There are certainly some facts that favor the opinion that moisture has something to do with the production of this disease; but enough is not yet known on this point to enable us to form a satisfactory opinion on the subject.

It may not be amiss to add, that I have seen nothing to lead to the belief that erysipelas is propagated by contagion. I do not mean to say that it never spreads in this

way, but merely that no fact has come under my observation, either in hospital or private practice, that gives the slightest countenance to this notion.

It is well known that great diversity of opinion has existed, and still continues to exist, as to the *treatment* of erysipelas. Two very opposite courses have been adopted, and the advocates of each have claimed a great degree of success for their method. One of these consists in administering tonics, particularly cinchona in some of its forms, from the very beginning of the attack; and the other, in depletion, treating it as a purely inflammatory affection. It is very questionable whether either of these methods is adapted to a majority of cases. There are but few patients, as far as I have seen, that will be benefited by bark through all the stages of erysipelas; and, on the other hand, though depletion is unquestionably highly useful to some at the onset, there are not many who will not derive advantage from tonics before the termination of the disease. In fact, they may be given with advantage earlier, and to a greater extent, than in almost any other complaint. This is particularly true of the class of subjects that are met with in hospital practice,—persons, for the most part, whose constitutions are impaired or broken down by previous disease or excess.

The sulphate of quinine is perhaps the best preparation, and the quantity given should not be less than half a drachm in twenty-four hours; in fact, patients are often benefited by a much larger quantity.

When blood-letting is required, topical bleeding is all that I have been in the habit of using; and this, I believe, is all that is required. I have not resorted to incisions, though they were much recommended at one time, because

it is difficult to limit the quantity of blood taken in this way, and because fatal effects have sometimes resulted from them. Punctures made with a lancet in the inflamed part are equally efficacious, and perfectly safe; but there is no objection, that I am aware of, to the application of leeches; and these I employ to a great extent, and apparently in many cases with very great benefit. They should be applied on the sound skin, and it is very unusual for the inflammation to extend beyond the part on which they have been applied. This is certainly remarkable, as leeches are supposed occasionally to produce erysipelatous inflammation, especially when applied about the face.

Local bleeding is the only topical remedy that I regard as of much value in the treatment of erysipelas. This opinion may excite surprise. Great confidence is placed by some in mercurial ointment, the nitrate of silver, diluted alcohol, lead-water and cold lotions; while others prefer warm applications. I must confess that I have not been able to satisfy myself that any one of these has the slightest power of arresting the disease, nor much in mitigating its violence. My practice, therefore, is to use that which is most comfortable to the patient.

The efficacy of local applications in erysipelas has probably been very much overrated. No one places any reliance on them in measles or small-pox, because they are constitutional diseases; and does not the same reason apply with equal force to erysipelas? Local bleeding is undoubtedly in many cases useful; but this cannot be regarded as a topical remedy only.

In severe cases, the disease is usually preceded by a chill, with intense pain in the head and back, and this is followed by great heat. These symptoms, for the most

part, occur before any change takes place in the appearance of the skin.

An active emetic, followed by a purgative, and this succeeded by some mild diaphoretic, as the liquid acetate of ammonia, seem to be the only general remedies that are called for in the first few days of the disease. At a very early period, however, quinine and other tonics, with a generous diet, can be given to advantage, especially to patients of feeble habits of body. Under this course I have often seen the pulse become stronger and less frequent, and the mind lose the wildness which is very apt to attend erysipelas, especially when it attacks the head and face.

A liquid diet, of the mildest possible kind, I believe to be best in the early stages; but, if the disease assume a severe form, generous and even stimulating food will be found requisite. Wine, wine-whey, wine and water, and malt liquors, are often useful; and in the low forms of the disease, especially in patients with feeble and shattered constitutions, I am confident that I have prescribed alcohol with advantage.*

Fracture of the Lower Jaw. — Six cases of this accident were admitted into the hospital during the year. Two of them were simple and four compound fractures; and I should think that this was not far from the usual proportion, judging merely from my own practice. The jaw is covered on the inside with so thin a layer of soft parts, that the injury which is sufficiently violent to cause the fracture is in many cases powerful enough to lacerate these.

* I am happy to state that not a case of erysipelas has occurred in the hospital during the last six months.

My purpose in noticing these accidents, however, is to speak of a simple mode of treatment, which is applicable to many cases, and which I have frequently found very efficacious. When the bone is not comminuted, and there are teeth on each side of the fracture, the ends of the bone can be kept in exact apposition by passing a silver wire or strong thread around these teeth, and tying it tightly. In several cases of fracture of the jaw, in which the bone was broken in one place only, I have, in the course of the last few years, adopted this practice with entire success, and without the aid of any other means. It will be found very useful, also, as an auxiliary, in more severe cases, in which it may be required to use splints and bandages, or to insert a piece of cork between the jaws, as recommended by Delpech. It requires some mechanical dexterity to apply the thread neatly; but in large cities we can avail ourselves of the skill of dentists for this purpose; and I have in this way been frequently indebted to the ingenuity of my friend Dr. Solomon Keep.

Fractures of the Thigh. — When this accident occurs below the middle of the bone, it is usually treated at the hospital by extension and counter-extension. The apparatus used for this purpose is a modification of Desault's, the modification consisting principally in the adaptation of a screw to the cross piece which connects the splints together at the bottom, and to this screw is attached the band or sock which passes around the ankle. By this means the extension is made more in the direction of the axis of the bone than by the original machine, and the fractured surfaces are consequently brought more in contact.

The objections that are often made to this apparatus I

have not found to hold good, to any extent, in practice. It rarely produces much irritation in the perineum; I have never seen ulceration there but once from this cause, and this was in a patient of a peculiarly irritable habit. It is more apt to give trouble about the ankle, on which the extending band is applied; and I have seen the heel ulcerate and slough in a few cases. These ulcers are exceedingly obstinate. Something, no doubt, may be done to prevent them, by careful attention; but they will occasionally occur, even when the utmost vigilance is employed.

Another inconvenience which sometimes follows the use of this apparatus is the stiffness of the knee. I have never known this, however, to be permanent; but it often continues several weeks, and is in some instances quite troublesome.

Notwithstanding these objections, I prefer this apparatus to any other that I have ever used for treatment of fractures of the shaft of the thigh-bone, below the middle. Fractures of the condyles of course require a different mode. In the great majority of those cases which I have seen treated in this way, there was but little if any shortening, deformity or lameness, and the patients hardly suffered at all while under treatment.

I am aware that writers urge many other objections to this apparatus; but I feel confident that most of these are theoretical, and are advanced by those who have never given it a trial, or have used it, perhaps, in cases where the fracture is high up, and in which I have no doubt that other means will be found more useful.

Mr. Amesbury's apparatus for fractures in the lower half of the thigh-bone I have never employed, merely because the one I was accustomed to answered the purpose so well.

It must be admitted, however, that in fractures of the upper third of the thigh the modified apparatus of Desault does not do so well as when the bone is broken lower down. This is especially true in fractures of the neck of the bone, either within or exterior to the capsular ligament. Some have supposed that when the fracture is entirely within the ligament bony union never takes place, whatever treatment may be adopted. But this is not correct, for there are well-authenticated cases to the contrary. It is no doubt difficult to effect bony union in this accident, because the head of the bone when thus detached is nourished only by the vessels of the round ligament, and because it is not easy to keep the fractured surfaces in contact, and the parts completely at rest. But even ligamentary union will be much more complete, if these circumstances are attended to, than if they are neglected; for, if the parts are not kept together, the ligament will be much longer than it otherwise would be, and the limb consequently less useful.

When the fracture is high up, there are of course more muscles inserted into the lower fragment, and consequently there is greater danger of displacement, than when the fracture is lower down; and it is also more difficult to confine the pelvic portion of the thigh-bone. Something more than mere extension and counter-extension is frequently necessary to bring the fractured surfaces in apposition under these circumstances; and it is very important that steady pressure should be made so as to keep them in close contact. Every one who is at all familiar with the treatment of fractures knows how great a power pressure exerts in bringing about a bony union.

Now, Desault's apparatus is not calculated to make this

pressure; and some have thought that in fractures of the neck of the thigh-bone the inner splint is apt to separate the fragments, by pushing the lower portion outward.

There are other indications which are not perfectly answered by this machine, when the fracture is high up. But it is unnecessary to speak of these, as it is not my object to make a treatise on the subject, but merely to notice an apparatus which I think accomplishes the intention of the surgeon more completely than any other that I have ever seen. This is Mr. Amesbury's fracture-bed. I shall not attempt to describe it, as no description would be intelligible without drawings, and its construction is so simple that it would be readily understood by any one who wished to use it. It is adapted to all fractures of the thigh occurring in the upper third of the bone, requiring slight modification in each case, and so constructed that the part on which the thigh is to rest can be made longer or shorter, as may be necessary, to adapt it to the size of the patient. During the last year I have used it several times; in one case of a fracture of the neck of the bone within the capsular ligament, and in another of the neck exterior to it. Both of these did well. There was scarcely any lameness or shortening of the limb, and the patients suffered but little while under treatment.

There was recently a patient in the hospital with a fracture just below the great trochanter, who used this fracture-bed. He was placed upon it immediately after the accident, and kept there five weeks, and was perfectly comfortable during the whole time. He has recovered the entire use of his limb, without any perceptible lameness or shortening.

Gonorrhœa. — But few patients with this disease, or syphilis, come to the hospital. None are received there on free beds; and from those who pay something more is required than from those laboring under other diseases.

For several years past, I have laid aside entirely injections in the treatment of gonorrhœa, and have substituted for them balsam copaiva, or cubebs, or both, according to circumstances. I have rarely found copaiva alone sufficient for the management of the disease. It very frequently produces an annoying cutaneous eruption before it has effected the purpose for which it is given, and we are obliged to lay it aside. Cubebs has been more often successful in my hands. This I give in doses varying from a scruple to a drachm, three times a day, in powder. It may be given at the beginning of the disease; and, instead of increasing the ardor urinæ, it usually lessens it.

When cubebs alone does not succeed, I have frequently found a combination of it with copaiva very useful. I have rarely known the following preparation to fail in removing the disease: R. — Pulv. gum acaciæ, pulv. cubeb, balsam copaib. āā ʒij.; aqua cinnamon. ʒxvi. M. From half an ounce to two ounces of this mixture should be given twice a day, and it should be administered as soon as the complaint is discovered. The only objection to it, that I am aware of, is that it is so extremely nauseous, that many persons find it difficult to take.

It is a common notion that strictures in the urethra, which are so frequent after gonorrhœa, are produced by the injections that have been used. And this, no doubt, is oftentimes the case. But I have more than once met with a stricture consequent on gonorrhœa where no injection had been used, the complaint having been removed by in-

ternal remedies. Whether these were cases of uncommon severity, I cannot say, as they did not occur in my own practice. It is probable, however, that they were, and that the stricture was the result of the effusion of fibrin, which it is well known sometimes takes place when the mucous membranes are highly inflamed.

Inflammation of the Hernial Sac. — The four following cases came under my care during the past year. They were new to me, and I am inclined to think that they will be so to most of my readers, as I can find no description of precisely similar ones in any work which I have consulted.* I regard them all as inflammation of the hernial sac, having many common features of resemblance, and differing from each other only as they were in

* The following case, in Mr. Mayo's excellent work, "Outlines of Human Pathology," has a strong resemblance to them :

"A patient (a recent case in the Middlesex Hospital) had all the symptoms of strangulated hernia ; there was a small tumor, feeling like an omental hernia, at the crural arch. The patient had a swollen and tender belly, and stercoraceous vomiting. Repeated attempts had been made to reduce the rupture, which the patient said was considerably larger before these attempts had been made. The bowels had acted twice with enemata. I did not attempt to return the tumor, but operated immediately, when I found an *empty sac ;* I divided the neck of the sac. The patient died in thirty hours. On opening the abdomen, the upper part of the small intestine was found distended, swollen, and inflamed. A segment of a portion of the ileum, which had been down, was deeply discolored, and retained the impression of the close grip of the neck of the sac. It had been forced back into the body, before the performance of the operation, by the taxis, too much injured for recovery, through the length of time it had been strangulated. The tumor upon which I operated was the sac, with thickened adipose matter partially surrounding it."

different stages of inflammation. In one of them the sac was gangrenous; in the second, fibrin was effused in abundance, but no pus formed; in the third, suppuration took place; and in the fourth, the inflammation was so much reduced, that it no doubt terminated by resolution.

These cases will be best understood by giving the hospital record of each, made at the time; and I shall present them in the order in which they occurred.

Case 1*st.* — Michael Murphy, aged forty. Married. Laborer. Irish.

July 20. — States that since childhood he has always had an inguinal hernia of the left side, easily and entirely reducible at all times; never any incarceration, that he is aware of. Six days since was attacked with pain in the abdomen about umbilicus, described as colic; got some cathartic medicine, which operated. Three days ago hernia came down, and has not been able to reduce it since. Has been bled twice, and the taxis attempted by several without success. Has not had much pain in the tumor. No vomiting. Took salts yesterday, which operated.

Now, pulse eighty-eight, of moderate strength. Tongue, white coat on lobes, moist. Strength good. No sickness. No pain, nor tenderness of epigastrium. Some tenderness in left iliac region; less in right. On examination, on the left side there is an inguinal hernia, — the size of two clenched hands, — to the touch hard, without resonance. Integuments slightly reddened. External ring tightly girt around the neck of the tumor, which is remarkably large and firm. Some pain upon pressure. Hernia probably omental.

A purgative enema was first given, which came away without operation. The taxis was then attempted in the

warm bath, but without success, although the size of the tumor was somewhat diminished.

The patient was then ordered the following: R. — Ol. crot. tig., gtt. i.; jalapæ, q. s. Ft. pil. no. i. Every four hours till free operation. Ice to be assiduously applied two hours. A consultation to be called for to-morrow, at eleven A. M., to decide on the propriety of operating under the present circumstances.

Six P. M. — Four full dejections after one pill. No reduction of tumor. Pulse as before. Apply bitter fomentations through night.

21. — Scrotum œdematous at bottom. Tumor still the same. Pulse eighty-eight. Very little pain. Slept part of night. A consultation being held, it was decided to perform the operation.

Eleven A. M. — Operation by Dr. Hayward. Patient being placed upon the table, an incision was then made from the edge of the ring two thirds down the tumor, dividing the integuments. The different fasciæ, which were much thickened, were then divided on a director in the usual manner. The sac, being thus exposed, was opened; it was one quarter of an inch in thickness. On opening the sac a gangrenous odor was emitted, and on further examination nothing was found in it. But the sac itself was in a gangrenous state. It was then decided to remove the sac, which was accordingly done, though with much difficulty, on account of the numerous and strong adhesions. In the removal of the sac, the tunica vaginalis testis was punctured, and about ℥ ij. of the water of a hydrocele escaped. Several arteries required ligatures, principally in the cellular membrane of the scrotum. The remaining portion of the sac bleeding freely, a ligature was placed round it. The

finger passed into the ring detected no stricture. The edges of the wound were then brought together, and retained in place by a single suture. Adhesive-plaster, pledget, dry lint, compresses and a T bandage, completed the dressing. The patient was then conveyed to bed.

22. — Some pain in the back yesterday P. M. Slept pretty well in night. Now quite easy. Pulse eighty-eight. No tenderness of abdomen. Tongue, thin white coat, as before. No pain in bowels. No dejection. R. — Ol. ricini, ℥ i.

23. — After oil five dejections. Night quite comfortable. Now, skin of good temperature. Pulse eighty-eight. Tongue as before. No tenderness or fulness of abdomen.

The whole of scrotum, together with testicle, swelled to five times the natural size; on right side œdematous, without pain. Upper part of wound open, discharging considerable offensive serous fluid. Portion of cellular membrane, etc., in a gangrenous state. Yeast poultice to upper part of wound.

24. — Continues comfortable. R. — Ol. ricini, ℥ ss.

25. — After oil two dejections. Continues quite comfortable. Swelling of right side of scrotum quite gone; of left side less, still hard, as if testicle enlarged. Sloughs separating. Much thin yellowish discharge. No pain. Pulse eighty-four. Tongue cleaner.

26. — One dejection yesterday. Continues much the same. Copious discharge of bright orange fluid from wound, with escape of gas on pressure, probably from the sloughing of the cellular membrane. If no dejection at two P. M., oil ℥ ss. Rice and milk.

It is unnecessary to give any more of the hospital

record. The patient continued steadily to improve, the wound healed completely, and on the 12th of September he was discharged "well."

This case, it will be perceived, was taken for omental hernia. It is true, however, that coughing did not give any impulse to the tumor when the hand was placed on it. But this was the only symptom that was wanting, and the absence of it was accounted for on the supposition that the omentum had formed strong adhesions to the neck of the sac, and that the tumor was in this way, as it were, insulated.

An operation seemed to be called for, as the tumor was increasing in size and tenderness, rendering the patient unable to stand, except for a minute or two at a time, and producing a great degree of œdema of the scrotum on both sides, which it was feared might terminate in sloughing.

The result, perhaps, may be thought to have justified the course that was adopted. If the case had been left to the efforts of nature, there would have been extensive if not fatal sloughing, even admitting that the patient could have escaped peritoneal inflammation, which was, no doubt, very much to be apprehended.

How far this state of the sac might be attributed to the attempts made to reduce the hernia, it is not easy to say. But it is certain that these were not great or long-continued after the patient was admitted into the hospital, and it will be seen by the third case that very severe inflammation of the sac may come on spontaneously.

The second patient was admitted into the hospital before the first was discharged, and his case is thus entered in the records of the house:

Case 2d. — Edwin Beard, aged 19. Single. Hostler. Boston.

July 31. — Patient reports that he has had a small inguinal hernia of the left side about one year. Has worn a truss, which, however, has not fitted him, the hernia occasionally escaping. Three days since, the tumor appeared, and has not been reduced since. Has worked till this morning, when he went to consult a truss-maker concerning a new truss, who advised his entrance here. Has had no constipation, no vomiting, and no symptoms of strangulation. No pain in tumor before to-day, and that only after being handled by several persons, who attempted to reduce it.

On examination — tumor the size of a hen's egg at the left inguinal ring, firm, elastic, slightly tender. Neck of tumor girted by ring. No impulse on coughing. Cellular membrane of scrotum somewhat infiltrated. Pulse sixty-four, of good strength. Tongue clean. Bowels open this morning. Purgative enema now. Twelve leeches to tumor. Liquid farinaceous diet.

August 1. — Slept quite well in night. Tumor as yesterday. Very slight pain. Two copious dejections. No tenderness of abdomen. Eight leeches to tumor.

2. — More swelling of tumor. More redness. Rather more tenderness and pain. Pulse and tongue as yesterday. No dejection. R. — Sol. mag. sulph., ℥ iij. Poultice to tumor thrice daily.

3. — More pain in tumor. Size increased. More redness. More tenderness. Considerable œdema of scrotum. Otherwise well. Appetite good. May have broth.

4. — Pain in tumor greater. Size, redness, tenderness, etc., increased. Tenderness especially about ring. Pulse

eighty-eight. Tongue, thin white coat. No tenderness of abdomen. Bowels open. Appetite good.

5. — Some œdema of tumor, pain, etc., as yesterday.

7. — Size of tumor less. Œdema still. Indistinct and uncertain sense of fluctuation. Otherwise well.

9. — Tumor rather diminishing. Tenderness less. Appearance of inflammation less. Otherwise well.

11. — Considerable diminution of tumor. Tumor at present about three inches in length, very firm, no indication of suppuration. Tenderness much less. Testicle plainly distinguished below tumor. Some œdema of scrotum. Pulse and tongue good.

17. — Swelling much diminished. Now firm, hard, not tender. Scrotum quite free from œdema. Otherwise well. Omit poultice. Apply the following lotion: R. — Ammoniæ mur. ℥ss.; aceti, aquæ, āā Oj. Ft. sol.

18. — Tumor perceptibly diminished since last report.

23. — Tumor diminishing and softening. Otherwise well.

27. — Tumor the size of a walnut, or perhaps a little larger; quite hard. Otherwise well.

30. — Tumor much the same. Apply empl. hydrarg. 3 by 2.

31. — Veins of scrotum and spermatic cord somewhat distended. Otherwise the same.

Sept. 1. — Tumor softening and diminishing. In other respects well.

5. — Redness increased by walking. No impulse on coughing. To wear suspensory bandage.

7. — Discharged well.

Case 3d. — Thomas Dancaster, aged 40. Single. Seaman. England.

February 8. — Patient reports — about twelve months ago noticed a small tumor, referred by him to the situation of the external abdominal ring of the right side, easily reduced by himself, and often returning into abdomen on lying down. Tumor was about "as large as the end of his thumb," and has appeared several times since, especially if his bowels became costive, as they frequently were, but he thinks not after any unusual exertion. Sometimes it did not come down for two or three months. Tumor has not been in the least painful or tender at any time till February 2d, nor has it incommoded him in any way.

February 2. — Patient sailed from Eastport, Me., and exerted himself in pulling ropes, etc., but not more than was usual with him; and about midnight was seized with severe pain across upper part of abdomen and about umbilicus, and towards morning with pain in right iliac region, the pain elsewhere ceasing. Since then, the tumor has been constantly increasing in size, pain, and tenderness. On night of sixth, when he arrived in Boston, the tumor, he thinks, was not larger than an egg, but since has increased very rapidly. Has had little or no sleep for three nights past. Appetite has been impaired by pain, but has had no chills, headache, or nausea. General health has always been pretty good. When on shore has been in habit of using ardent spirits freely. Has never worn a truss.

Now, pulse sixty-six. Appetite small. Tongue slightly coated. Five dejections yesterday, after salts. Much pain in tumor. Upon examination, a large tumor, commencing about two and a half inches within and one inch below right superior spinous process, and running obliquely

downwards and inwards, and terminating just above the testicle, being five inches long, and three inches broad at widest part, having a straight and abrupt face outwards, but inwards gradually rounding off towards hypogastrium, having a decided fluctuation across its middle. Integuments œdematous, with a blush of redness, and somewhat tense. Much tenderness on pressure. No impulse felt on coughing, but pain is increased by it. R.— Sol. mag. sulph. ℥iij., and repeat if need. Eight leeches to tumor. Large poultice after leeches. Milk and vegetable diet. Horizontal posture.

February 9. — Experienced much relief of pain after leeches. Slept but little; was restless. Now, tumor quite tender, but less painful than at entrance, and rather more fluctuating. Four dejections.

10. — Fluctuation now very decided. Slight pointing about middle of tumor, near its outer edge. Slept but little, from pain. Tenderness increased. Pulse sixty-eight. No dejection. R.— Sol. mag. sulph. ℥iij., and repeat if need.

11. — Slept but little, restless in the night, and had considerable pain. Early this morning abscess broke spontaneously, and discharged freely, perhaps ℥iij. in all. Discharge thick, purulent, with some coagula, rather dark and slightly fœtid. Tumor now diminished, less tender, little painful, redness less. Appetite improved. No headache. Six dejections, at least, after two doses.

12. — Has had but little pain. Slept well. Appetite pretty good. Two dejections. Tumor less, but slightly tender, not painful; quite hard in most parts.

14. — Doing very well. No pain. But very slight tenderness in tumor. Little discharge. Slept well. Appetite good. One dejection. Simple dressings.

15. — No dejection. No pain. Discharge scanty. R. — Sol. mag. sulph. ℥ij., and repeat if need.

23. — Abscess almost entirely healed. Slight tenderness just opposite spine of pubis on outer edge. Some induration. Walks about, though not with perfect ease.

March 9. — Abscess entirely healed. No tenderness. Some induration for about one inch below abdominal ring. Impulse or motion of intestine felt on grasping remains of tumor close to ring. No trouble in walking or stooping.

20. — Discharged well.

Case 4th. — Daniel W. Bemis, aged thirty-eight. Married. Sailor. Boston.

March 2. — Patient reports — his mother told him that thirty years ago he had a fall, striking right iliac region upon the corner of a table, and that a swelling ensued soon or immediately after in the situation of the inguinal ring; but patient himself recollects nothing of the fall, or of the tumor till twenty years ago, since which time he has always worn a broad canvas belt around pelvis, passing over the face of the tumor, and prevented from slipping upwards by a thigh strap. During these last twenty years, tumor has varied in size from a "pigeon's egg to a hen's egg," and at all times has felt soft and elastic, yielding readily before the finger, but instantly resuming its former shape on removing the pressure. Never has been tender to the touch, nor red, nor painful. Tumor would attain its largest size only in wet, stormy weather, and would return to its smallest size on the return of fair weather. Patient has never experienced any inconvenience in straining or lifting, and would only be reminded of increased size of tumor by its pressure on the belt, and has not been subject to cramps in bowels.

February 25th, P. M., felt an unusual degree of pressure against belt, with a sharp, cutting pain in situation of tumor, patient at the time sitting perfectly still, and not having exerted himself previously. Went up stairs and removed belt without relief, and then undressed and went to bed. Soon after, while lying on left side, and pressing forcibly on tumor with the ends of fingers of both hands, he heard a rumbling, gurgling sound, and at the same time felt something shoot suddenly down between the ends of his fingers into the scrotum, accompanied by a sensation of tearing in part. Pain continued sharp and steady through night of 25th, and through the next day; and ceased almost entirely after this, except on night of 27th, as will be stated. On morning of 27th had one small, hard dejection, the first since attack. Had had one dejection the day previous to attack. On night of 27th was attacked with cramp, which was soon followed by nausea and vomiting, and considerable pain in tumor, and vomited about a quart of yellowish, watery fluid, pain continuing by spells through night. On 28th, early in morning, took one ounce of salts, which were followed by eight or nine dejections; and yesterday morning half an ounce of salts, which operated freely last night and this morning. He had no pain since night of 27th, and no appetite since 25th; and has experienced no inconvenience for last two days, except from operation of medicine. Tumor has been quite tender during the whole time, and has been constantly covered with fomentations. General health has always been good. Has not been to sea for the last twelve months, and latterly has used spirits very freely.

Now, pulse seventy. No appetite. Tongue slightly coated. Says he feels perfectly well, excepting slight pain

at upper and lower parts of tumor, where there is some tenderness. On examination, tumor commences at abdominal ring, and extends downwards and inwards to the bottom of the scrotum, being six inches in length by measurement, and having a general resemblance, in shape, to a large pear; base somewhat flattened, measuring four inches from before backwards, and three inches from side to side. Tumor nowhere feels indurated. Portion occupying scrotum is very yielding to the touch, elastic, and decidedly fluctuating. Upper portion more resisting, and giving a slight impulse on coughing, but perhaps only what would be communicated by the motion of the integuments, etc. No impulse on grasping lower part of tumor. Slight blush of redness over base of tumor. Scrotum not tense, but corrugated. Testicle not to be felt, which, by report of patient, has never descended into scrotum as low as the left testicle, it remaining just at the side of the commencement of the penis. Patient thinks it is smaller than the other, and that it was injured in his fall. Ten leeches to base of tumor. Poultice after leeches. Milk and vegetable diet. Horizontal posture.

3. — Has had no pain since leeches. Sleeps well. Tenderness entirely gone. No perceptible alteration in tumor. No appetite. No dejection. Pulse seventy-two. Keep tumor constantly wet with the following: R. — Ammoniæ mur. ℥ss.; aceti, aquæ, āā Oj. Ft. sol.

4. — Last evening complained of some griping pains in bowels, and got sol. mag. sulph. ℥ij., since which has had one dejection. Slept well. Has had no pain in tumor, which is evidently diminished in size. No tenderness. No redness. Feels perfectly well.

5. — Two dejections yesterday. While in water-closet,

about half-past five P. M., having the last dejection, during which he kept a steady pressure on the tumor with both his hands, he felt considerable pain in situation of abdominal ring. Upon returning to bed, and lying on back, in a few minutes he felt a dragging or pulling pain in right lumbar region; and on drawing up his knees, and while still pressing on tumor with his hands, it suddenly shot upwards into abdomen with a gurgling noise. Had slight pain about ring for a short time, but slept well. Now, greater prominence than natural from ring to top of scrotum, but no induration. Sac felt extending about one inch below ring; and on coughing, the motion or impulse of a short loop of intestines is felt. Intestine can be readily returned into abdomen, and the index finger easily passed into the abdominal ring, which is quite large. Testis now felt opposite root of penis; is rather tender. Discharged well.

It must be admitted that there is some obscurity about these cases, but the supposition that in all of them the hernial sac was inflamed, seems to explain them better than any other. It is true that the sac does not ordinarily take on inflammation to any considerable extent; at any rate, it rarely becomes thickened by it. In cases of strangulated hernia, in which the operation is performed, we often find the sac very thin and semi-transparent, as much so as in health, though it may have been subjected to a great degree of pressure in the attempts made to reduce the hernia. On the other hand, it is certain that in the first case the trouble consisted solely in inflammation of the hernial sac, which had become excessively thick and gangrenous. There was no protrusion of omentum or intestine, and there was no strangulation; and yet this case

had more marks of hernia than any of the others. It proves, unequivocally, that the hernial sac can undergo changes of an important character, such as are calculated to render the diagnosis difficult; and these changes seem to be the result of inflammation, which may come on spontaneously.

All these patients had, for some time before they came under treatment, been subject to hernia; in all of them the tumor was small, extending but little, if at all, beyond the external ring, occupying the inguinal canal. From some cause, a protrusion, to a considerable extent, of some of the abdominal contents, took place, carrying before them, of course, the hernial sac; in two of the cases there seem to have been, for a short time, some symptoms of strangulation, which soon passed off; but in all of them the contents of the sac, whatever they may have been, were no doubt returned into the abdomen.

There was in the first case the most satisfactory evidence that the tumor consisted solely of hernial sac. It was cut down upon and laid open; it contained neither omentum nor intestine; but it was inflamed, thickened, and gangrenous.

In the second case there was no well-marked symptom of strangulated hernia, or even of reducible hernia. There was no impulse on coughing; no constipation; no vomiting or nausea; and no pain, except in the tumor. The outline of the hernial sac could be distinctly traced with the hand, and its upper part was tightly girt by the external ring. Under an active antiphlogistic course it was gradually reduced in size, but the sac could be still felt, though it became thinner, and much contracted; the pain subsided, and the patient found no inconvenience in resuming his ordinary avocations.

The circumstances attending the third case enabled me to form a satisfactory opinion of the precise nature of the difficulty. When the contents of the abscess were discharged, the finger could be passed in at the opening, and the hernial sac could be distinctly traced up to the abdominal ring. As the inflammation went off, the sac contracted; but it could be plainly felt in its whole extent, though much reduced in size, at the time the patient left the hospital.

The sudden reduction of the tumor in the fourth case throws over it some degree of obscurity, as it is not usual for the hernial sac to be returned after it has once been protruded from the abdomen. This may, however, happen. Some operators reduce it, when it can be done with ease, in the operation for strangulated hernia; but it is a practice by which nothing is gained, which is in some degree hazardous, and which, consequently, should not be imitated.

There are instances on record, also, in which it has been reduced by taxis; and this is much more likely to happen when it has been recently protruded than when it has been of long standing, as there is, of course, much less probability of the existence of adhesions in the former than in the latter case.

The "gurgling noise" which the patient said he heard at the time the tumor was reduced might have proceeded from the intestine which was in the upper part of the sac, as a small portion of the intestine could be felt near the ring after the reduction, which could be readily returned into the abdomen, and which, no doubt, went up at the time he reduced the tumor.

It must be admitted that in ordinary cases, in which the hernial sac becomes thickened by inflammation, the

interior of the sac remains unchanged, differing, therefore, in this respect, from two of the cases just related. But, on the other hand, it is well known that some of the serous membranes, when inflamed, are not only thickened, but covered by a false membrane. This is the result of acute inflammation, such as took place in these cases, wholly unlike that which usually occurs in old hernias, and which is altogether of a chronic character.

The following operations were performed during the year:

Amputation of thigh	3	Removal of cancer of breast	3
" leg	3	" " tongue	1
" toes	3	" " face	1
" fore-arm	1	" hemorrhoids, internal	3
" fingers	1	" hydatid of breast	1
Cataract	2	" nævus, by ligature	1
Fissure of the rectum	1	" tumors, various	4
Fistula in ano	6	" " chronic mammary	1
" urinary	1	" fungus hæmatodes on abdomen	1
Hare-lip, double	1	" do. of breast	1
Hernia, inguinal	1	" testis	1
" femoral	1	" tonsils	1
Hydrocele, by incision	1	Trephining	1
" palliative operation	1		
Ligature of femoral artery	1	Total	53
Paracentesis abdominis	1		
Polypus of the nose	2		
Prolapsus ani	3		

All the patients, with two exceptions, on whom operations were performed, either recovered entirely, or so far as to be able to leave the hospital. The two individuals who died had received severe injury; a leg in each case was literally crushed, and when reäction came on the suf-

ferings of the patients in the injured part were extreme. The limbs would have been useless if they could have been saved; but this was not possible, nor was it probable that life could have been preserved if they were not removed. One of them was amputated above and the other below the knee.

The first of these had suffered from copious hemorrhage before his admission, which did not take place till about twelve hours after the accident. A slight reäction, however, had come on, and the circumstances of the case would not justify any longer delay. He rallied somewhat after the operation, and his sufferings were much diminished; but he soon began to sink, and died in about eight hours after the amputation.

The second patient lived several days, but his injury was not confined to the limb. His principal pain was referred to the abdomen, and the contents of this cavity were found, on examination after death, to have been highly inflamed. Though the amputation did not save life, I have no reason to think that it tended in the least to hasten the fatal termination. This should rather be attributed to the extent and severity of the injury.

It is not, perhaps, perfectly well settled, even at the present day, at what time amputation should be performed after accidents, when this operation is necessary; in other words, whether it should be done immediately, or whether we should wait till reäction comes on. At any rate, it is certain that a uniform practice does not prevail; some surgeons operate without delay, while others prefer to postpone it till the system has in some measure recovered from the shock of the injury.

There are, no doubt, cases in which the operation may

be done at once, the constitution not having suffered from the accident. But when the constitutional symptoms are severe, the pulse feeble, the skin cold, and the respiration perhaps laborious, I cannot doubt that the operation should be deferred till these symptoms have passed off. They arise from the shock which the nervous system has received; the local injury at that time is of secondary importance; it adds nothing to the sufferings of the patient, and an operation done when nature is struggling to restore the vital energy would be likely to cut off all chance of recovery. As soon as reäction takes place, the injured part becomes painful, and should then be removed.

There is also some difference of opinion as to the means that should be used for the purpose of bringing on reäction; some administering alcohol and other powerful stimulants freely, while others disapprove of their use altogether. It is, I believe, safest and best to depend on the application of heat, both externally and internally applied; by means of hot spirituous fomentations over the heart and epigastrium, and mild warm drinks introduced into the stomach. Some cases may possibly require small doses of the aqua ammoniæ, camphor, or wine diluted with water; but these should be given sparingly, as the great danger is from inflammation, that is so apt to come on after reäction has taken place.

Amputation. — Of the seven large limbs that were removed, six were done by the circular operation. This fact is noticed, from the circumstance that Mr. Liston has recently seen fit to denounce this operation in unqualified terms, declaring it to be "vile and inadmissible" in all cases where there are two bones in the limb. It is not, perhaps, surprising that an individual should have a

decided preference to that particular mode of operating which he has adopted; but it is remarkable that he should give a sweeping condemnation of a method which has the sanction of some of the greatest names in modern surgery. The flap operation is better adapted, no doubt, to some cases, than the circular; but there are very many others in which I believe that the latter will be found to be the best. In fact, I must confess that where circumstances will admit of the performance of either, I should operate by the circular incision. It has, to my mind, advantages over the other method, that more than counterbalance the greater length of time which is required for its performance. A better stump, it seems to me, is made by it, and the parts heal with quite as much readiness. A patient, from whom I removed the leg above the knee by the circular operation, in June, 1837, walked out in sixteen days after the amputation, the wound being entirely healed. An artificial limb was fitted to the stump in a few weeks after, and upon this he has walked with great comfort ever since.

Two of the amputations were performed in consequence of that peculiar affection of the knee-joint, so well described by Sir Benjamin Brodie, in which a remarkable change of structure takes place, nearly the whole of the interior of the articulation being converted into a gelatinous mass. The patients were both young men, a little more than twenty years of age, of scrofulous habit. The disease had in each existed several years, increasing gradually, but at no time attended with severe pain. The constitution at length becoming affected, an operation was advised. One of them, whose limb was removed more than a year ago, has since enjoyed uninterrupted health. He recovered

rapidly, and is the individual to whom I referred as having walked out so soon after the amputation.

The second patient convalesced more slowly; the system seemed to suffer much more from the shock of the operation; but in three or four weeks a favorable change took place, and he was discharged from the hospital "well," in forty-four days after the removal of his limb. His health continued good for some months, when the other knee began to be slightly affected, which he at first attributed to fatigue and over-exercise. Whether this trouble has assumed the same character as the original disease, and what his present situation is, I am unable to say, as he resides at a distance from the city, and I have not seen him since he left the hospital.

I have noticed these two cases, because it is not long since this peculiar affection of the knee-joint was first described, and because it is not yet well understood. My own experience in relation to it would lead me to believe that it is not so malignant in its character as it has usually been supposed to be; and that if amputation be performed before severe constitutional symptoms appear, the life of the patient will oftentimes be preserved.

Cataract. — Cases of disease of the eye are not numerous at the hospital, and no doubt will become less so as the means of that excellent institution, the Massachusetts Charitable Eye Infirmary, are more enlarged. We had but one patient with cataract during the year. He had amaurosis in one eye, attended with complete loss of vision; and a cataract in the other, which came on in consequence of an injury. This eye was also slightly amaurotic, and the sensibility of the iris was somewhat impaired. His sight was only sufficient to enable him to

distinguish the light, and opaque bodies when they passed between him and the light.

I operated twice on this patient, dividing the cataract and capsule, and leaving them to be dissolved. The first operation gave him some degree of vision; but finding, after waiting three months, that portions of the capsule and the cataract still remained, I operated again, and the solution went on more rapidly. Neither operation was followed by much inflammation. When he left the hospital, his sight was so much improved that he could distinguish objects and walk about without assistance. There was reason to believe that a greater improvement would take place, as absorption was still going on; and I have since learnt that this is the case.

Fissure of the Rectum. — There is, perhaps, no surgical operation that affords so much relief as that for fissure of the rectum, and there is hardly any disease that is more painful. It consists in a superficial ulceration of the rectum, sometimes extensive, but more often narrow, and rarely more than an inch in length. It is found more frequently on the sides and posterior part of the gut than on the anterior. It extends down to the sphincter, and can usually be brought into view, if the patient strains down. When this cannot be done, it can be felt by introducing the finger, though this is attended with great pain.

The greatest suffering is experienced at the time of defecation, and it is then often so severe that the patients are obliged to lie down for some time after. The pain is attributed by Dupuytren to a spasmodic contraction of the sphincter; this seems probable from the relief that the division of the sphincter gives in these cases before the ulcer heals, and from the fact that the same train of

symptoms is sometimes met with when no ulceration can be detected. There is reason to think, too, that there is nothing peculiar in the character of the ulcer, as it usually heals so readily after the operation; and this circumstance favors the opinion that it is often the result of mechanical violence, produced sometimes by hardened fæces, and at others by strong efforts made in parturition. It is very certain that it is more frequent in females than in males, and more common in those females who have borne children than in those who have not.

This complaint is aggravated by cathartics, and though anodyne enemata afford some relief, I have not found anything but the operation sufficient for the cure.* This consists in dividing the sphincter, either by cutting from within outwards, or from without inwards, carrying the incision, if practicable, through the centre of the ulcer. The method from without inwards I should think was to be preferred, as you can, in this way, by passing the finger into the rectum and cutting upon it, limit more precisely the incision than when you cut from within outwards. The dressing and treatment are the same as after the operation for fistula in ano.

The patient on whom I operated at the hospital was a healthy man of thirty-seven years of age. The difficulty had existed about four months, and was always greatest when the bowels were constipated. The trouble was steadily increasing; the pain was extreme after every dejection, and his sufferings were so great as to unfit him

*When the ulcer is on the sphincter or exterior to it, constituting what may be called fissure of the anus, local applications, particularly Dupuytren's belladonna ointment, with rest, may cure it.

for his ordinary duties. In all other respects his health was good.

On examination, I found just within the margin of the anus, towards the sacrum, a narrow ulcer, an inch or more in length, quite tender and painful to the touch. The bowels having been emptied by an enema, the operation was performed in the following way: The fore-finger of the left hand having been introduced into the rectum, a spear-pointed scalpel was thrust in outside of the sphincter, till it reached the point of the finger, thus including the sphincter between the edge of the scalpel and the finger. Both were then simultaneously withdrawn, the scalpel cutting its way out through the fissure. Lint was introduced between the lips of the wound, and a compress and a T bandage completed the dressing. For two or three days he had slight spasms about the anus, which were relieved by anodyne fomentations. But after this period he had no trouble; his dejections gave him no pain, though the ulcer was not healed, and he was discharged from the hospital "well," in fourteen days after the operation, in all respects able to resume his ordinary avocations.

Hare-Lip. — For the last two or three years, in performing the operation for hare-lip, I have not used the common hare-lip pins. They are almost always troublesome from their size, and occasionally produce ulceration, and in this way retard, if they do not altogether prevent, the success of the operation. Instead of them I have used, when operating on very young infants, small insect pins, and, for larger children, long, fine steel needles. A head of sealing-wax is easily attached to these, and the sharp end, after it is carried through the lips, can be easily

cut off by bone-pliers. They interfere less with the process of adhesion than the old method, and in a number of cases in which I have used them I have been much pleased with the result.

Hernia, Inguinal and Femoral. — There was, strictly speaking, no operation at the hospital, during the year, for inguinal hernia; the case which was entered as such by the house-surgeon has already been spoken of, in the remarks on inflammation of the hernial sac. In almost all the important particulars the operation there noticed resembled that for strangulated inguinal hernia; but it will be recollected, no doubt, that the sac was found to be much thickened, empty and gangrenous; that it was removed, and the patient recovered.

The operation for strangulated femoral hernia was performed on an unmarried female thirty-five years of age. She first discovered the hernia three years ago; and in a year after it became strangulated, and was reduced by the taxis. From that time she had worn a truss, but this had not always prevented the hernia from descending.

About half-past eight o'clock, on the morning of the operation, while coughing violently, the hernia came down and became strangulated. She had medical aid at eleven o'clock, and I first saw her at one P. M. As the taxis had been ineffectually tried, I advised, before further attempts, venesection and the tobacco glyster. These having been used, I saw her again at three o'clock, and made another attempt at reduction. This not succeeding, she was removed to the hospital, and the operation was performed at four o'clock.

This was done in the way recommended by Sir A. Cooper. Two incisions were made, one across the tumor,

and the other at right angles to it, in the form of the letter T inverted, ⊥. The sac contained about two inches of small intestine, no omentum. The stricture was so firm that though strangulation had existed but seven hours and a half, the intestine was almost black, but not gangrenous. As soon as the stricture was divided and the bowel returned, she was much relieved. The operation gave her but little pain, but her sufferings had been intense during the whole time the strangulation existed. The bowels were freely evacuated by two ounces of the solution of salts, which were given a few hours after the operation; and the patient ultimately did well, though her convalescence was tedious.

This case would not have been noticed, had it not been for a peculiar circumstance connected with it. She was menstruating at the time of the operation; this discharge was then suddenly suppressed, and did not reäppear for some months. Though everything connected with the hernia did well, the wound healed kindly, and the bowels were either open spontaneously or easily moved by gentle laxatives, she was feeble for a long time, and troubled with a variety of complaints that could not readily be explained, though they were probably in some way connected with the sudden suppression of the catamenia.

There was a morbid condition of the mucous membrane of the whole alimentary canal, affecting particularly the mouth, and pharynx, and rectum, attended with a copious secretion of viscid mucus. She had severe pain by paroxysms in the bladder, vagina, uterus and about the anus; and though these were relieved by leeches and other means, it was apparent that her sufferings were very great. No sooner would one set of symptoms give way, than

another, equally distressing, would appear; and this state of things continued, though in a less severe form than at first, for nearly three months, — till, in fact, the menstrual evacuation made its appearance. From that time a perceptible, though gradual, improvement in her health took place.

It is certainly not usual for a sudden suppression of the catamenia to produce such grave symptoms, and it can only be explained by supposing either that she was in a morbid state at the time of the strangulation, or that this, together with the operation, might have rendered her unable to resist causes of disease which under ordinary circumstances would have had but little influence.

Hydrocele. — Of the three operations for the radical cure of hydrocele which are still in use, namely, injection, seton and incision, neither of them, I think, is adapted to all cases. In cases of old hydrocele, where the tunica vaginalis is so thickened and opaque that there is no translucency in the tumor, no one would probably use the injection. And even where it seems to be proper, it is often very uncertain in its effects, sometimes not exciting sufficient inflammation to cure the disease, and at others exciting so much as to cause no small degree of anxiety. It is unfortunately true that the pain felt at the time of the operation is no indication of the degree of inflammation which will ensue. I have known a portion of the scrotum to slough where no fluid escaped into the cellular membrane, and where the patient complained of no pain at the time of the operation. Everything was done in the most skilful manner; and I feel that I have a right to speak confidently about it, as I was not the operator.

Again, even in the hands of the most careful, some of

the injection will occasionally escape into the cellular membrane; and then a train of troublesome, if not dangerous symptoms, ensues. I am aware that this accident can usually be guarded against; but it will not always be, except by those who frequently practise the operation.

But if this accident does not occur, and the inflammation be not excessive, we often meet with another difficulty; and that is, the operation fails because there is not inflammation enough.

This, then, must be regarded as an uncertain operation; and I should advise its performance only on healthy adults, in cases where there was no doubt of the nature of the disease.

The *seton* would seem to be, *à priori*, the best mode of operating. It gives but little pain; it evacuates the fluid; it can be made large or small, retained for a longer or shorter period, as the case may require, so as to bring on the precise degree of inflammation that may be necessary. But I tried it twice, the last year, and failed. The case was a fair one; the patient a healthy boy of nine years old. I had punctured the tumor several times before. I introduced a small cord, consisting of four threads; he complained but little at the time; the water oozed out, till it was all discharged, and the testicle was so much swollen, at the end of four days, as to fill entirely the tunica vaginalis. The cord was then removed, as he complained of the soreness; the swelling subsided, but in three weeks effusion took place again.

After waiting more than a month, I repeated the operation, using a cord double the size of the other, and retaining it there twice as long. It produced similar effects to the other, and at the expiration of two months

after its removal the fluid was again effused. This shows that the common opinion, that the disease will return in a month after the operation, if at all, is not correct.

From these experiments I shall not be inclined to try the seton again, as I cannot do it under more favorable circumstances.

The operation by *incision* is usually regarded as a very severe one. I have not found it so, though I have done it very frequently. It, to be sure, requires the patient to be confined to his bed usually three weeks; it is attended with a considerable degree of soreness, and some pain; but, on the other hand, I believe it to be perfectly safe, and always successful. It is unnecessary to describe the mode of doing it, as it must be familiar to every one who is at all acquainted with surgical practice.

This operation is certainly to be preferred to the others in all cases where there is any doubt as to the nature of the disease, — for the incision settles that question, — and in those where the other operation has been tried and has failed.

Within a few years a new method for the cure of hydrocele has been introduced; and, if we might trust the published accounts, it has been attended with great success. I allude to the mode recommended by Mr. Lewis and Mr. Travers, of Great Britain. It consists in puncturing the tumor in one or more places with a small needle. A drop of fluid usually escapes at each puncture; and when the operation succeeds, the part from half an inch to an inch in diameter around the punctures becomes œdematous, the whole of the fluid in forty-eight hours is absorbed, and effusion does not again take place. This is the account given of it by its advocates, but it does not accord with

my experience. I have tried it in seven cases, and repeated it several times in some of them. I have followed as exactly as I could the directions laid down for its performance; I have used various kinds of needles; and I have not succeeded in a single case. Were it not that others with whom I had conversed had been equally unsuccessful, and that I had not met with an individual who had succeeded, I should have attributed it to my own want of skill.

In one of my patients the œdema formed around the puncture and the fluid disappeared in six-and-thirty hours, but was effused again in three weeks. This was the only case in which there was a prospect of a cure.

I shall not abandon it without further trials; for if it would answer as a substitute for the operation now in use, it would be a great improvement in surgical practice.

Ligature of the Femoral Artery. — This operation was performed in consequence of secondary hemorrhage after amputation below the knee. The patient was very feeble, having suffered from the affection of his limb eighteen years; this latterly had assumed a fungoid appearance, and had occasionally bled. It was found, at the time of the operation, that the posterior tibial artery was softened and diseased to such an extent as to render it difficult to secure it. This was at length accomplished, and the ligature remained on twelve days. It then came off spontaneously, and in twenty-four hours after an arterial hemorrhage took place. This was arrested by the tourniquet; a second occurred on the following day, the compression having been removed from the artery, and a slight one again in the night. The whole amount of blood lost was inconsiderable, but he was already so much re-

duced that the loss of any was an injury. It was therefore determined to tie the femoral artery, and this was done thirty-six hours after the first hemorrhage. He lost no blood, and he suffered but little pain in the operation. The wound and stump both healed kindly; and in a few weeks he was discharged, perfectly well, from the hospital.

It would probably be thought best, in any similar case, to tie the femoral artery, instead of searching for the bleeding vessel in the stump. Be that as it may, it was clearly the only course that could have been safely adopted in this instance. The patient could not, probably, have borne the suffering and loss of blood to which the other method would have subjected him; and if the artery could have been found and tied, it is not likely that it would have answered the purpose, as the vessel at that part was in a diseased state.

Prolapsus Ani. — When this complaint is in an aggravated form, it is well known that an operation is often performed for its relief. This consists in removing a part of the prolapsed portion, and when cicatrization takes place the contraction is such that the difficulty is in a great measure obviated. This operation was formerly done either with the knife or scissors; and I should have continued to use one or the other of these instruments, if I had been guided by my own experience alone. In no case has the use of them in my practice been followed by alarming hemorrhage, and only in one instance by a serious one.

But with others the result has sometimes been different. There are accounts of severe and even fatal hemorrhage after this operation with the knife; and a prudent surgeon, therefore, would hardly feel justified in exposing his

patient to so much hazard, if any other mode could be devised.

I am satisfied, from several trials, that the operation by the ligature is perfectly safe, equally efficacious, and hardly, if at all, more painful than the old method. The operation can be readily done in the following way. An enema of warm water should be first administered, and when this comes away the prolapsed portion can usually be thrown exterior to the sphincter. It can then be seized with a double hook, which should be held by an assistant. A needle, armed with a double ligature, should then be passed under the base of the prolapsed portion, the needle cut out, and one string tied firmly in one direction, and the other in the opposite. The part should then be carefully returned within the sphincter, and the ligatures allowed to hang out at the anus. If the pain be severe, an anodyne enema, or an opiate by the mouth, or both, should be administered. The patient should keep in a horizontal position, and live on a mild liquid diet for a few days, and take a gentle laxative on the second day after the operation. The ligatures usually separate in from five to ten days; I have rarely known them to come away sooner than this, and in some cases I have seen them retained much longer.

This operation is the same as the one recommended by the late Dr. Bushe, though I had practised it some time before the publication of his work. It will be found, also, a very safe and effectual mode of removing hemorrhoidal tumors, there being the same objection to the use of the knife in this case as in that of prolapsus. When the tumors are exterior to the sphincter, they may be freely cut off; the hemorrhage is never troublesome.

It is no unusual thing to find, after the operation for prolapsus and internal hemorrhoids, that the patient is troubled with stricture of the rectum. This is, of course, produced by the cicatrization, and is in most cases readily overcome by the use of a rectum bougie. If the patient should continue to use this occasionally for a length of time after the operation for either complaint, there will be much less danger of a return of the difficulty.

Another important means as a preventive is the daily use of an enema of cold water. This should be thrown up in the morning, just before the usual time for a dejection, and it will in most instances produce the desired discharge from the bowels without pain. From a gill to half a pint of water is sufficient.

Nævi can also be removed by ligature, used in the same way as in the two other cases. When the nævus is very large and firm, I have sometimes, in addition to tying it in this way, passed a long slender needle under it, introducing it in the sound skin at some distance from the tumor, and bringing it out in a similar way on the opposite side. I have then passed another needle at right angles to this, and around the two I have carried a strong thread several times, drawing it tightly as possible, and then tying it. I have never known this to fail.

This operation, even on young children, produces much less irritation than could have been supposed. I have tried it upon them at all ages, and I have never witnessed any alarming or severe symptoms. The pain, whatever it may be at the moment, soon passes off, and the child generally becomes quiet in a few hours.

Removal of Cancer of the Tongue. — The operations for the removal of cancer of the tongue that have come

under my observation have rarely been successful. The disease usually soon reäppears in the neighboring parts, apparently more malignant in its character, and certainly more rapid in its progress, than before the operation. I believe that I can truly say that, with perhaps one exception, the disease has in every instance returned. In all the cases the diseased part was entirely removed, and in some of them the actual cautery was applied to the remains of the tongue, in part for the purpose of arresting the hemorrhage, and partly to eradicate completely the disease.

Sir Everard Home thought that much was gained by using the ligature instead of the knife. In the only instance in which I tried this, it was wholly unsuccessful. The case was a fair one; the disease was limited; the whole of it was removed, and the patient in other respects healthy. Yet the wound had hardly healed before the disease reäppeared, and went on with great rapidity till it destroyed the patient.

It seems somewhat singular that cancer of the tongue should be so unmanageable, when the operation for cancer of the lip succeeds more often than that for the same disease in any other part of the body. It is true that some have supposed that the eroding ulcer, with everted and hardened edges, that is so often met with on the lip, has not the malignancy of true cancer. But this opinion does not seem to be well founded; for it is certain that if this ulcer be left to itself, or improperly managed, it will terminate in death.

The operation for cancer of the tongue to which I referred above as probably successful, was performed at the hospital in the month of January last. The patient

was a healthy man of good habits, thirty-eight years of age. The disease had existed five months. It appeared, as it usually does, in the form of a small, hard tubercle. It came on the tip of the tongue; it is more often met with on the side. It increased gradually, and gave him no pain till about two months before the operation. At the time of his admission it was quite painful and very troublesome from its size and situation, being somewhat larger than a nutmeg. It had perceptibly increased during the week before his admission.

As the use of tobacco is supposed by many to have an influence in the production of cancer of the tongue, I made the inquiry as to this patient's habit in this respect, and learned that he had never chewed nor smoked tobacco, and had used snuff very sparingly.

The operation was performed in the following manner, the day after he entered the hospital. The tongue being protruded, it was seized with a long-bladed polypus forceps transversely behind the tumor, and firmly compressed. The tumor was then taken between the thumb and forefinger, a sharp-pointed scalpel was passed behind the tumor through the healthy part of the tongue, and about one third of the organ was cut off. A ligature was applied to each of the lingual arteries. There was scarcely any blood lost at the time, owing to the compression made by the forceps, and no hemorrhage took place afterwards. The wound healed entirely in three weeks, and in a month the patient was discharged well. The disease, I presume, has not returned, for if it had I have no doubt that I should have heard from him, as he lives only a few miles from the city, and I requested him, when he

left the hospital to inform me if he had any further trouble.

Trephining. — An account of this case has already been published. The patient, a clergyman, had suffered twelve years from epilepsy, arising from a diseased state of the cranium. The carious portion of bone was removed, with complete relief. Six months have elapsed since the operation, and I have reason to believe that during the whole of the period he has had entire exemption from his epileptic paroxysms.

There are several other cases upon which I should have been glad to have offered some remarks, had I not already exceeded the limits which I proposed to myself. I therefore close with the expression of a hope that those who have the charge of similar institutions, in our country especially, would from time to time give reports of all the cases that come under their care. In this way our hospitals will be rendered still more useful to the public.

Boston, *October* 1, 1838.

REPORT

OF THE SURGICAL CASES AND OPERATIONS THAT OCCURRED IN THE MASSACHUSETTS GENERAL HOSPITAL, FROM NOV. 1, 1840, TO MARCH 1, 1841.

PATIENTS.

Remaining in hospital, Nov. 1, 1840	19	Discharged well	26
		" much relieved	26
		" relieved	7
		" not relieved	4
		" transferred	2
		" not treated	2
		" dead	3
			70
Admitted between Nov. 1, 1840, and March 1, 1841	69	Remaining in hospital March 1, 1841	18
Total	88	Total	88

DISEASES.

Anchylosis of the toe	1	Caries of elbow-joint	2
Abscess in the ear	1	Club-foot, varus, both feet	3
" over hip-joint	1	" " one foot	3
Burn	2	" pes equinus	1
Bursa of patella enlarged	1	Contraction of ham-string tendons	1
Carcinoma labii	1	Disease of hip	1
" nymphæ	1		

Disease of hip, with disloca. on dorsum ilii 1
" of foot 1
" of eye (iritis) 1
Dislocation of the femur . . 1
" shoulder, with fracture . . 1
Fracture of tibia 1
" " with paralysis of lower extremity . . 1
" femur 2
" " with laceration of scalp 1
" of tibia and fibula . 2
" " of both legs (compound) 1
" of fibula (compound) 1
" of patella 1
Fungoid disease of breast . . 1
Hydrocele, both sides . . . 1
" one side 2
Injury of hip-joint (by fall) . 1
" bones of foot . . . 1
" mid. finger, r. hand 1
" right knee 1
" head 1
" " (by fall from church) . . . 1
" great toe 1
" eye 1
Loss of toes of right foot . . 1
Necrosis of femur 1
" clavicle 1
Paronychia 1
Rigidity of muscles 1
Scirrhus of breast 1
Scrof. excres. on nose and lip 1
" ulceration of hand, with contraction of fingers 1
" enlargement of testicle 1
Sore toe (from injury) . . . 1
Spine, outward curvature of 1
" outward curvature of, with paral. of lower extremity 1
" tenderness of 1
" disease of 1
Sprain of back 1
" hand 3
Stricture of œsophagus . . . 1
" rectum 1
Tumor (hydatid) on inside of knee 1
" (steatomatous) on arm 1
" " right lumbar region 1
" (scirrhus) right breast 1
" (encysted) on neck . 1
" " above clavicle 1
Ulcer (simple) on leg . . . 4
" " stump . . 1
" (irritable) leg . . . 1
" (varicose) " . . . 3
" (sloughing) " . . . 1
Wounds, on scalp 1
" " and face . 1
" head, face and hands . . . 1
" throat 1
" arm (gun-shot) 1
Wry neck 1

Total 88

Erysipelas. — It will be perceived, by the foregoing table, that during the period embraced in it no case of erysipelas occurred in the hospital. This was the more worthy of notice, as in some former years this disease had been very prevalent there at this season of the year, and as there were several accidents in the house during the winter of 1840–41, such as severe lacerations of the scalp, in which it is so apt to come on.

In the preceding report, I stated that prior to the autumn of 1837 there had probably not been a year, in the twelve preceding ones, in which there had not been one or more fatal cases of erysipelas in the hospital; that at that time a change had been made in the mode of ventilating the wards, and from the time of that change up to the period of the publication of the report the disease had in no instance been fatal, but had assumed a less malignant character than formerly. It gives me great pleasure to add, that since that time there has not been a single death from erysipelas in the hospital, nor has the disease been more frequent or severe there than what it might be expected to be under similar circumstances in private practice.*

Though this fact throws no additional light on the *cause* of erysipelas, it must be conceded that it shows strongly the advantage of ventilation, by means of which the wards are supplied with pure air, in place of that which has become foul and noxious by exhalations from the patients, or from any other cause.

* The above was written more than a year since, and I am happy to have it in my power to say that there has been no fatal or severe case of erysipelas in the hospital from that time to the present, — April, 1842.

It may not be amiss to add, that the exemption from erysipelas which the hospital has enjoyed for the last four years cannot be attributed to the fact that the disease has been less prevalent, or in a milder form, in this vicinity, during that period, than formerly; for, by referring to the bills of mortality of the city, it will be seen that there were more deaths in Boston from erysipelas during these four years than in any other equal space of time of which there is any record. In fact, it appears that from the year 1811 to the year 1836, inclusive, a period of twenty-six years, there were but forty-six deaths from erysipelas; while in the four years from 1837 to 1840, inclusive, there were no less than forty deaths from this disease, and not one of these occurred in the hospital.

In noticing, in my former report, the treatment of erysipelas, I spoke of bleeding by leeches as both safe and useful, and I have since had no occasion to alter this opinion. The leeches should be applied on the sound skin in the immediate neighborhood of the disease; and when thus applied they often seem to mitigate its violence, without in a single instance, to my knowledge, causing any serious inconvenience.

I advert to this subject now, because Mr. Liston, in his Elements of Surgery, says "bleeding by leeches is not admissible, for the leech-bites prove a source of irritation, and are liable to suppurate; erysipelas has been often produced by leeching." This, to be sure, is high authority; at the same time I must be allowed to say, that, having used them freely in this disease for more than fifteen years without such effects, I shall continue the practice until something occurs to convince me that I am in an error. Notwithstanding the strong terms of commendation in

which he speaks of free incisions, it cannot be denied that, though in some cases they may be resorted to without danger and with great benefit, they are not adapted to all, and are occasionally unsafe. It is well known that the hemorrhage from them in some cases has been excessive, and in others fatal; and there is no one, probably, who would employ them in erysipelas of the head and face, where leeches are often used to the utmost advantage. It is not denied that inflammation often follows the application of leeches, but it is by no means certain that it is of an erysipelatous character. It resembles that which frequently arises in consequence of a blister, and like it passes off spontaneously in a few days.

Deaths. — There were but three deaths in the surgical department of the hospital, from Nov. 1, 1840, to March 1, 1841. Two of these were in consequence of severe burns: one of the patients died in a few hours after her admission, and within six-and-thirty hours from the accident; and the other lingered several weeks, and at length sunk from that continued irritation which so often arises from extensive suppurating surfaces. The other fatal case was that of a young female, who entered the hospital with scrofulous abscesses about the hips, nates and loins, and at length died with tuberculous disease of the lungs and mesentery.

Burns. — There is some difference of opinion among surgeons as to what should be first applied to the injured surface in cases of burns. This difference arises probably in part from the fact that the same application would not be proper in every instance; at the same time it must be acknowledged that different and almost opposite views have been entertained on this point by intelligent practi-

tioners. When the injury has been sufficiently severe to disorganize the skin, either with or without destroying any of the subjacent parts, the local application that is first used can be of but little consequence, as the vitality and consequently the sensibility of the part is destroyed; our principal object is then to support the system, which usually, under such circumstances, receives a severe shock, especially if the burn be extensive. In doing this, however, we should rely chiefly on mild means, as there is great danger of excessive reäction. Our topical applications in such cases can only be useful when the dead and disorganized parts have been separated from the living. But in less severe cases, where the vitality of the skin is not destroyed, the pain is intense, and much may be done to lessen the sufferings by proper local means. In slight burns, cold, in some of its forms, is perfectly safe, and the most comfortable application to the patient. When the injury is on the extremities, this may be applied in the form of iced water, by means of cloths dipped in it and frequently changed, or ice itself. In using the latter, however, care should be taken not to continue it too long at a time, lest the skin should be frozen, and painful and troublesome sloughing be the consequence. But when the burn is over the thorax or abdomen, neither of these applications would, perhaps, be perfectly safe; and if the skin be unbroken, cloths wet in diluted alcohol and applied to it would be much better. This latter remedy is nearly as comfortable to the patient, and has a greater power than the others of preventing the vesications from being as extensive as they otherwise would be. But in large burns, especially if the skin be broken, equal parts of olive-oil and lime-water will be found among the most soothing

means that can be used. When these articles are not at hand, soap-suds is a very good substitute; it requires, however, to be removed frequently, and the frothy part only should be applied.

Great relief is often afforded by discharging the contents of the vesicles, especially when they are large. But this should be done by making punctures in the sound skin at a little distance from them; it is important to leave the cuticle whole, as it forms the best protection for the inflamed and tender parts beneath.

When there is an extensive suppurating surface from burns, it is desirable to avoid frequent dressings, which usually give the patient extreme pain. It has been proposed to sprinkle the parts, in such cases, with scorched flour, and to repeat this as often as may be necessary to absorb all the fluids which are effused. In this way a crust is formed over the tender and denuded parts, which completely protects them from the air, and thus essentially lessens the sufferings of the patient. It is said by some that this crust may be allowed to remain till the parts beneath have entirely healed. In the few cases in which I have employed these means, I have been pleased with the result.

Some notion may be formed of the pain which is sometimes caused by dressing a burnt surface, by the following fact. Several years ago I saw an individual who was so severely burned that it became necessary to amputate one of the arms; the patient afterwards told me that the pain of the operation was not equal to that of a single dressing.

In some cases of obstinate ulcers following burns, I have found an application of creosote very useful; diminishing their irritability, and rendering them more inclined to heal.

Eight drops of creosote mixed with an ounce of mucilage of gum-Arabic, or with an ounce of stramonium or marsh mallows ointment, are the forms in which I have usually employed it.

It must be confessed, however, that these ulcers will be often found very unmanageable under any course; the action of caloric seems to have produced such an effect on the part, that it with difficulty takes on the restorative process.

Bursa over the Patella, Enlargement of. — There was one case of this kind in the hospital when I entered on my duties. The patient, however, was nearly well. The tumor was punctured by Dr. Warren soon after the patient entered, and when the sac began to fill up, which it did in a few days, it was laid open by a free incision; this brought on the requisite degree of inflammation; the wound healed kindly, and the whole difficulty was removed.

This enlargement of the bursa over the patella is by no means unfrequent. I have seen more cases of it in females than in males. It sometimes comes on spontaneously; at others it is the effect of an injury, not showing itself, however, till some days after the injury has been received, and is then discovered at first usually by accident; and again it is thought to arise very often in consequence of pressure. Hence it is frequently called in England the housemaid's knee.

When it is the seat of active inflammation, as it sometimes is, red, hot and painful, it should be treated by leeches and cold applications; and these are frequently sufficient to remove it. But ordinarily it is not inflamed. It is a simple, colorless swelling, without pain, and is inconvenient only from its size and situation; though the

patient often imagines that the limb of that side is not as strong as the other. It is certainly desirable to remove it, because it will continue to increase in size; and occasionally I have known it to take on a low degree of inflammation, which terminated in ulceration, leaving an irritable sore, that was very difficult to heal.

A very simple, and in most cases I have found it an effectual mode of treating these enlarged bursæ, is to puncture them so as to drain off all the contents, and then apply a blister, keeping it open for ten or twelve days, by means of savin cerate, or some other irritating application. But when the swelling has existed for a long time, so that the cyst has become much thickened, and its contents changed in character and consistence, this method will not always succeed. In such cases the tumor should be punctured, and if it fills again, as it usually does, it should be laid open by a free incision. It may be necessary to insert a piece of lint between the lips of the wound to bring on the proper degree of inflammation; should this, however, be excessive, a poultice should be applied. I have never seen a case where it was requisite to remove the sac, though it is said that occasionally a cure cannot be effected without it.

This is a difficulty that cannot be safely tampered with; it is best, I believe, in all cases, to puncture it in the first instance, though this alone is rarely sufficient to effect a cure. But if more powerful means are adopted at once, a degree of inflammation will sometimes come on, extending perhaps up the whole limb, with such severe constitutional symptoms as to render it troublesome, if not alarming. Nothing serious is to be apprehended from a simple puncture.

Some years since I introduced a small seton, consisting of two or three threads only, through an enlarged bursa over the patella; and though a cure was effected by it, the inflammation was so great that I have never been tempted to repeat the practice.

Contraction of the Ham-string Tendons. — A healthy girl, thirteen years of age, was admitted into the hospital in September, 1840, in consequence of a congenital contraction of these tendons. It was stated that at her birth her limbs were drawn up in contact with her back; but, by the persevering use of various mechanical contrivances, they were so much brought down that at the age of seven years she could walk on her knees, her heels being in contact with the nates. Some further improvement was made by the use of different apparatus, so that at the time of her admission she could bring the toes of one foot to the ground, though not those of the other, and with the aid of a pair of crutches she could get about on a level surface, but was obliged to go up stairs on her knees; and it was apparent that this was her easier and more usual mode of walking, for the knees were now covered with two thick, fleshy cushions. Both legs were much bent at the knee, and any attempt to extend them gave her great pain. The principal resistance seemed to be from the firm contraction of the ham-string tendons. On the 14th of October the outer ham-string tendon of one leg was divided in the usual subcutaneous method by Dr. Warren; this gave but little pain at the time, and no inconvenience ensuing, all the ham-string tendons of the other leg were divided on the 20th, and on the 28th the two internal ham-strings of the leg first operated on were divided. The apparatus for extension was not applied in any instance

till the wound in the integument had healed, and the patient suffered but little from the use of it. The limbs slowly but gradually came down, so that by the 18th of November the best limb was nearly straight, and she could bring the sole of the foot to the floor, bearing the greater part of the weight of the body on it without causing much pain. She was discharged on the 18th of January, a little more than three months after the first operation, "much relieved." Her sufferings had been slight during her treatment, and her general health was unimpaired. At the time she went out, the sole of one foot was fairly brought down, and she touched the floor with the toes of the other when she walked, so that with the aid of crutches she was able to get about on her feet with comparative ease. There can be but little doubt that, with proper attention on her part, a much greater degree of improvement will take place.

It should also be stated that this was by no means a favorable case. There was some mal-formation about the knees, and the insertion of the tendons was much broader than is usually met with. Yet, notwithstanding, she gained more in three months, by the operations, than she had in the preceding thirteen years. I say by the operations, because the apparatus that was applied was of the simplest kind, and because far more complicated and powerful machinery had been used before her admission to the hospital, with comparatively slight benefit.

There have been two other patients on whom this operation has been performed in the hospital, with a very good degree of success.

One of these was a little girl, eleven years of age. She entered in May, 1840. Five years before her admission,

she received a blow on her right knee, which was followed by severe inflammation; she was under treatment for a year, and then partially recovered, the knee being bent, the patella fixed, and the ham-string tendons tense. At the time of her admission, she could not touch the toes of the affected limb to the floor while erect.

On the 30th of May, I divided the tendons of the biceps femoris, the semi-membranosus and semi-tendinosus. So much inflammation followed, that extension was not applied till the 15th of June. This was continued, together with friction, the warm spout bath and passive motion daily, with gradual improvement, till July 4th, when, after free exercise, considerable inflammation occurred in the whole joint. This yielded to warm fomentations, etc., in five days, and the extension was then reäpplied. On the 22d, she could place her foot fairly down on the floor while standing in an erect posture, and bear most of her weight upon it. She was then discharged, at the request of her friends, who were desirous that she should return to her home, which was some distance from the city. At the time she left the hospital she could walk with tolerable ease; and though the patella was still fixed, the motion of the joint was somewhat improved.

The improvement in this case was rapid and very great, and when it is recollected for how short time the extension was applied, it must be attributed principally to the division of the tendons.

Disease of the Hip. — There is certainly no one method of treatment that is adapted to all cases of this formidable disease. If the exact seat of the morbid affection was known in each instance, there would be less difficulty in deciding on the proper curative course. But few

surgeons of the present day will probably agree with Mr. Ford in the opinion that in most cases the disease begins in the articular cartilages; though it cannot be doubted that these may, in some instances, be the first that are attacked by the morbid affection, it will, I think, be also admitted that it occasionally begins in the synovial membrane and the bones themselves. It would be difficult to explain the variety of symptoms that appear in different cases on any other supposition.

In children under puberty, I have thought that the disease began most often in the synovial membrane or the bones, while at a later period of life the articular cartilages were more frequently the first attacked.

There is one circumstance which has attracted less attention than might have been expected when we consider its importance, and that is the occasional displacement of the head of the thigh-bone from its articulating surface, without the formation of an abscess. I have seen several cases of this kind; in most of them there were severe local and constitutional symptoms before the head of the bone was pushed out of the socket; when this took place these gradually subsided, and the patients ultimately recovered, with limbs more or less shortened. In these cases there was no secretion of pus that was apparent, and no ulceration of the surface; the dislocation seemed to have been effected by some morbid deposit made in the joint. The shortening is generally from two to three inches, and if such patients are allowed to bear any weight on the limb as soon as the pain and tenderness pass off, it will be still greater. Not only absolute rest is important at such times, but extension should be made as soon as it can be borne, and kept up steadily till a new socket is

formed, or the joint becomes anchylosed. The time required to accomplish this is different in different cases, but many months will be necessary under the most favorable circumstances. Under this course I have seen a limb that was three inches shorter than the other brought down, so that there was no apparent difference in the length, with a hardly perceptible change in the appearance, and but a very slight degree of lameness in walking. This was done, too, without subjecting the patient to any suffering.

A case of this kind was admitted into the hospital early in February, 1841. The patient was a child of eight years of age, of a feeble habit of body. Five months before his admission he had had typhoid fever, by which he had been very much reduced, and had not, when he entered the hospital, recovered his flesh and strength. Five weeks before his entrance it was discovered that the left limb was shorter than the other, that the nates on that side were broader, and that the foot turned inwards.

At the time he came to the hospital, the affected limb was three inches shorter than the other, and the head of the thigh-bone could be distinctly felt on the dorsum of the ilium. One of the most remarkable circumstances about this case was, that there was no local pain, either before or subsequent to the dislocation of the bone.

Extension in various forms was applied and steadily kept up till the first of June following, when he was discharged "much relieved." He not only did not suffer during his treatment, but, on the contrary, gained in health and strength, and was much more comfortable when the extension was kept up than when it was suspended. At the time of his discharge his limb was only one inch and

a quarter shorter than the other, he could walk with some degree of freedom and ease, and there was much less lameness than could reasonably have been expected.

In the *treatment* of hip disease, it seems to be conceded, at the present day, that entire rest is of the utmost importance till the whole morbid process has ceased. In the acute cases that are sometimes met with, accompanied with pain and tenderness, the patient has no disposition to move the limb, but it is essential, if we intend to prevent a great degree of lameness and deformity, that the head of the bone should be kept quiet in its socket, without the slightest motion, after the active symptoms have passed off; and it is equally important, too, in those cases in which a morbid degeneration goes on in the joint without causing suffering, or giving any signs of inflammation. Without rest no other means can avail, and when this is strictly enforced hardly any other local ones will be required. In young subjects especially, counter-irritation in all its forms, by blisters, setons, issues and actual cautery, may in most cases be advantageously dispensed with. The occasional use of leeches, where there is much pain, will be found useful; two or three at a time, applied at intervals of three or four days, are usually sufficient. But it is not prudent to continue the use of them for a great length of time, as they are not required after the pain subsides, nor after there is evidence that the suppurative process has commenced.

In the hip disease of patients beyond the age of puberty, however, some form of counter-irritation is occasionally useful; and issues are, perhaps, on the whole, preferable, as they seem to exert a more decided control over the morbid action than any of the other irritating applications,

and to produce a less injurious effect on the system of the patient.

A hollow splint, extending from the nates to the foot, has appeared to me to be the best mode of confining the limb. It can be made comfortable to the patient by means of cotton wadding, and is easily kept in place by a roller. It has the advantage over the stiff bandage recommended by Mr. Liston, that the limb can be examined from time to time without moving it, and consequently without giving pain. It is important in many cases that the limb should be often examined, especially if an abscess be forming.

The extended position of the limb is not only the most comfortable to the patient, but is oftentimes the only means of preventing the bending of the knee, which occurs in so many cases in hip disease, and which frequently proves so obstinate and unmanageable.

The apprehension that is so often expressed by friends, that the confinement of the limb will prove injurious to the health of the patient, is altogether groundless; on the contrary, the relief that is usually obtained by the extended position is so great, that the general health is almost uniformly improved by it. This course should be continued till the disease has passed off; and in those cases in which an abscess has formed and the head of the bone is dislocated, the continuance of the splint is of the utmost importance, for it prevents the great degree of shortening that would otherwise take place. Attention to diet and the state of the bowels seem to be the only other means that are required.

This report was printed thirteen years ago. Since that time many cases of hip disease have come under my care,

and nothing has occurred to change the opinion then expressed of the nature and proper treatment of this formidable malady.

I should not, therefore, have thought it worth while to have adverted to the subject again, had it not been for the publication of a very interesting article on "Coxalgia" in the sixth volume of the Transactions of the American Medical Association, by my friend Prof. Alden March, of Albany, N. Y. Coming from such a source, it is entitled to special notice.

On one point, and that one of considerable importance, Prof. March is at variance with the great majority of, if not with all the surgeons who have written on hip disease; and presents an array of surgical authorities from which he differs, enough, one would think, to settle almost any controverted subject in surgery. He maintains, in opposition to them, "that spontaneous dislocation of the hip (as purely the result of morbid action, unaided by superadded violence) seldom or never takes place." This opinion, he says, is "based upon actual observation and personal examination of about forty pathological museums in this country and in Europe," in which he saw "about two hundred specimens of what I [he] took to be hip disease." In the museum at St. Bartholomew's Hospital, however, he says that there was one specimen that "appeared to be more like a spontaneous luxation from hip disease than any that I [he] had seen, or afterwards saw, in all my [his] researches."

Admitting — what no one who knows Prof. March would be inclined for a moment to doubt — the entire accuracy of the statement, it does not seem to me by any means to be conclusive evidence of the correctness of the

opinion he maintains. The whole of it is of a negative character, and must fall to the ground if a single positive fact can be found opposed to it.

It is not in anatomical museums that I should expect to find specimens of the spontaneous dislocation of the femur. These collections are made up, for the most part, of preparations obtained from the bodies of hospital patients, and are preserved for the purpose of illustrating the disease of which the individual died. If a patient should fall a victim to hip disease, there can hardly be a doubt that, in most cases, all the parts connected with the joint would be in a state of disorganization; the ligaments, in great measure, destroyed; the cartilages ulcerated; the bones carious; the head and neck of the femur, perhaps, gone, carried away by the destructive process of ulcerative absorption, which is met with in the advanced stages of this disease; and the acetabulum enlarged, in all probability, in the manner described by Prof. March.

In all the cases that I have regarded as spontaneous dislocation of the femur, the patients have recovered, and there of course has been no opportunity of making a thorough anatomical examination of the condition of the parts. But in some of these cases, especially those in which there was no abscess, the signs of dislocation of the femur have been as well marked and unequivocal as I have ever seen where the displacement of the bone from its socket was the result of violence.

I have examined, within a few days, the limb of a gentleman twenty-four years of age, whom I attended fourteen years ago for an affection of the hip. He was at that time under the care of two of our most eminent physicians, and was just recovering from a severe attack of scarlatina.

As this was passing off, he was seized with violent pain in the hip, which terminated in a shortening and contraction of the limb, without the formation of matter.

At this time I saw him. He then had no pain; his leg was bent on the thigh almost to a right angle; and it appeared, from repeated measurements, that the limb was two inches and a half shorter than the other. By careful and persevering use of extension and counter-extension, and such other means as the case seemed to require, the contraction was entirely overcome, and the shortening reduced nearly an inch.

From that time to the present he has enjoyed uninterrupted health, with the exception of a slight febrile affection, that lasted only a few days. He walks with perfect ease, without the assistance of a cane; the head of the bone moves with great freedom, and can be distinctly felt on the dorsum of the ilium; the foot is turned inwards, and he has, in fact, all the signs of a dislocation of the hip upwards and backwards.

It would require more specimens than would fill forty, or forty thousand pathological museums to convince me that this was not a "spontaneous dislocation of the femur, the result of morbid action, unaided by superadded violence."

I have seen other cases like this, so well marked that a doubt never crossed my mind that I had made an error in my diagnosis; and I have something more to learn before I shall be convinced that I have.

But there is still stronger evidence than this in support of the opinion which Prof. March controverts. Whoever has read the admirable work of Sir Benj. C. Brodie on Diseases of the Joints, — and I presume that there is no surgeon, or student of surgery, in our country,

who has not, — can hardly fail to recollect a case which he gives, that bears directly upon this point. He examined the body of a patient who died at St. George's Hospital of this disease. "There were no remains of the round ligament."

"The cartilages had been destroyed by ulceration, except in a few spots."

"The bones, on their exposed surfaces, were carious; but they retained their natural form and size. The acetabulum was almost completely filled with pus and coagulated lymph; the latter adhering to the carious bone, and having become highly vascular. *The head of the femur was lodged on the dorsum of the ilium.* The capsular ligament and synovial membrane were much dilated; and at the superior part their attachment to the bone was thrust upwards, so that, although the head of the bone was no longer in the acetabulum, it was still within the cavity of the joint."

This case is noticed by Prof. March. He asks how "the head of the femur was still in the cavity of the joint," if it were "lodged on the dorsum of the ilium." Perhaps the phraseology is objectionable; but the undisputed facts of the case are enough to prove that the head of the bone can be pushed from the socket by disease without violence, and the capsular ligament remain whole.

March, 1855.

Dislocation of the Femur. — A healthy laborer, forty-five years of age, was admitted into the hospital at ten o'clock on the morning of the 31st December, 1840, in consequence of an injury of the right thigh, which he received two hours before, by the fall of a bank of earth.

At the time of his admission he was in great pain in the injured limb, with a pale countenance and feeble pulse. When standing up, he stooped forward; nates of the right side rounded, knee flexed, and the limb something more than an inch shorter than the other. There was great difficulty in abducting or rotating the limb, and severe pain and faintness were induced by the attempt. At twelve o'clock he was carried into the operating room and placed on the table, having previously taken one grain of tartarized antimony in solution. About eight ounces of blood were taken from the arm, and another grain of antimony given, but neither fainting nor nausea were induced. Counter-extension being made by a strap, well padded, passed between the thighs and held by three assistants, extension was made obliquely over the left leg, and the knee gradually abducted; the head of the thigh-bone came out of the ischiatic notch with an audible start, and seemed to be above and posterior to the acetabulum, from which position it could not be drawn by manual force.

The pulleys were then applied, and while the limb was gradually extended in the same direction as before, the head of the femur was seen and distinctly heard to go into the socket. The thigh could now be moved easily, though with pain to the patient, in any direction. A roller was passed around his pelvis, and he was carried to his bed. The pain left him almost immediately after the reduction of the bone; the soreness soon subsided, he walked across the room with a slight limping in four days, and in eight days he walked without any lameness, and was discharged "well."

This is a case of that dislocation of the hip which Sir Astley Cooper says is "the most difficult to detect and

reduce: to detect, because the length of the limb differs but little, and its position is not so much changed, as regards the knee and foot, as in the dislocation upwards; to reduce, because the head of the bone is placed deep behind the acetabulum, and it therefore requires to be lifted over its edge, as well as to be drawn towards its socket."

The reduction in this instance, however, was easily accomplished. This was owing partly, I think, to the direction in which the force was applied; and more, no doubt, because the attempt was made so soon after the accident, before the muscles had become firmly contracted.

The immense advantage of the compound pulleys, in all dislocations in which any considerable degree of extending force is required, can only be doubted by those who have not witnessed their application. They give much less suffering to the patient than is caused by manual extension; and they enable the surgeon to apply the force with ease, to continue it without relaxation, and to extend it gradually as far as may be necessary. Manual force cannot be applied so steadily; it is often made by jerks, and, as the assistants become weary, as they soon do, the muscles contract with great force, so that renewed and violent efforts are necessary to carry the head of the bone into its socket.

Fractures. — There were ten cases of fracture in the hospital during the period embraced in this report. Three of these were fractures of the thigh-bone, six of the bones below the knee, and one of the patella. The course pursued there, in the treatment of fractures of the shaft of the thigh-bone below the middle, has been to apply the modified apparatus of Desault; in other words, to make use of extension and counter-extension. This has in most

cases succeeded admirably well. The patients have suffered but little while under treatment, and have usually recovered with scarcely any perceptible lameness or deformity.

The advantages of the extended position of the limb, in a majority of cases of fracture of the thigh, are now admitted by the best surgeons of Great Britain; though this method was opposed, not many years since, by some of the most distinguished professional writers of that country. Experience has taught them that the objections made to it were not well founded, and that the ill consequences that sometimes arose from its adoption were too often the result of the carelessness and neglect of the attendant.

The starch bandage, or immovable apparatus, as it is called, is no doubt a valuable improvement in the treatment of fractures. In many cases where the bones of the lower extremity are broken, it does away with the necessity of confining the patient to his bed, by affording a steady, uniform and firm support to the limb, and thus preventing, in a great measure, the danger of displacing the fractured ends of the bone. He can by this means move about with the aid of canes or crutches, and bear some degree of weight on the injured leg, even before the provisional callus is formed. It will also be often found useful in fractures of the arm, enabling the patient to walk freely about his ordinary avocations, not requiring his confinement to the house for a single day.

In numerous cases it has been applied at the hospital with great advantage; nor am I aware that any bad effects have resulted from it there in a single instance. But it must be admitted that its injudicious application may be productive of the most disastrous consequences. By the

undue pressure which is sometimes made by it, inflammation, ulceration and gangrene, have followed, that have cost the patient his limb, if not his life.

I should not regard it safe to apply a starch bandage immediately after the occurrence of a fracture, if the limb were swollen at the time, or if there was reason to believe, from the degree of injury, that swelling was likely to come on. The swelling in such cases may arise from the effusion that takes place, or from the inflammation that is the consequence of the violence that has been done to the parts. In either case, mechanical pressure cannot prevent it; and it is well known that the combined action of pressure and inflammation will cause a part to ulcerate, and, if it be continued, sloughing will follow. It not unfrequently happens that a bone is broken without the occurrence of any swelling, the force which caused the accident having been applied at some distance from the fracture. In such cases a starch bandage can be early applied with safety; it is only necessary to wait a few hours, and if swelling has not then begun, longer delay will not be required.

It is not my purpose in these remarks to point out the various circumstances in which a starch bandage may be useful; my sole object is to caution those who are not familiar with it against its indiscriminate application.

Another recent improvement, in the treatment of fractures, is the introduction of the cold-water dressings. These are especially valuable in compound fractures, but they are also highly useful in all those cases of simple fractures in which there is any considerable degree of contusion or injury of the soft parts. In former times, the great object, in compound fractures, was to promote the sloughing, and

assist nature to separate the dead from the living parts. But surgeons at the present day adopt means to prevent the sloughing, and, where this cannot be accomplished, to limit it as far as possible. The cold-water dressings and local bleeding by leeches are among the most powerful agents in effecting this. Instead, therefore, of applying hot fomentations and poultices in a case of compound fractures, cloths dipped in cold water, frequently renewed, are all the dressings that are now deemed requisite in the early stages. They have the advantage of allaying the inflammation far more than the old method, and they are, at the same time, much more comfortable to the patient. In several cases I have been satisfied that gangrene was prevented by the adoption of this course.

There was one case of fracture of the patella. The patient was sixty-seven years of age, in tolerable health, though feeble. In coming down stairs he made a false step, and the fracture was the consequence of the violent contraction of the muscles. It was transverse, as it usually is when produced by muscular action. He was brought to the hospital sixteen hours after the accident; the knee was much swollen, and very painful. His body and limb were put in such a position as to relax the muscles, and leeches and cold applications were applied to the joint. No apparatus was used till six days after the accident; at that time, the swelling and pain having in a great measure subsided, a very simple one was employed. The limb was first covered with a roller from the foot to the hip, and a hollow splint was then applied on the under side, extending from the nates to the heel. To this were attached two rollers, each two and a half yards long, six inches apart, one above and the other below, and

these carried above and below the joint were sufficient, with the aid of compresses, to keep the fragments of the patella in apposition. Union took place in five weeks; passive motion was then gradually given to the joint, so that in two weeks more he walked with ease and could bend his knee, and he was discharged "well." The bone was united here, as is usual in such cases, by ligament; but this was so short that there was no lameness or inconvenience. It is undoubtedly true that a ligamentary union in fractures of the patella is better than that by bone, provided the ligament is short; as it is stronger, and less liable to interfere with the motions of the joint. To effect union in these cases, a simple apparatus, with a proper position of the body and limb, seems to be all that is required; at any rate, it is more likely to be accomplished in this way than in any other. A starch bandage I should not regard as safe and proper in fractures of the patella; there is so much swelling, for some days, that ulceration, if not sloughing, will probably follow its application, if it was made early; and either of these, in such a situation, would be of a very serious character.

Hydrocele. — The operation by incision is frequently performed at the hospital for the radical cure of this disease. This is principally owing to the fact that many of the cases that come there are of long standing, upon which operations have been unsuccessfully performed before. It is no doubt true that, if the method by injection always succeeded as well as it sometimes does, it would be preferable to all others. But it is not adapted to all cases; it not unfrequently fails, and sometimes the fluid used for the injection escapes into the cellular membrane of the scrotum, producing very troublesome and serious effects; and this

has been said to happen when there was no want of care or skill on the part of the operator. The operation by incision is somewhat more severe than that by injection, and requires the confinement of the patient for at least three or four weeks; — on the other hand, it is unattended with danger, and it is certain to effect a cure. The pain produced by it is not so much greater as that from the injection as is generally supposed; in some instances, patients who have undergone both operations have assured me it was less.

Two or three years since I operated on a young man, and made use of tincture of iodine for an injection, following the directions as to quantity, etc., laid down by the best writers on the subject. All the fluid passed into the tunica vaginalis; not a drop of it escaped into the cellular membrane. The pain was intense, not only as long as it remained there, but for several hours after. A great degree of swelling of the testicle followed, so as to confine the patient to his bed for several days, and to his room for some more. I consoled myself with the belief that, though the severity of the symptoms was great, a radical cure was certain. But it was not so; in a few weeks the effusion again took place, and before long the scrotum was as full as before the operation. A few months after, I operated by incision, and a radical cure was the consequence. The patient assured me that he suffered much less from the second operation than from the first.

The same statement was made to me in February, 1842, by a patient on whom I operated at that time by incision. Some years before, the operation by injection had been performed by a surgeon in a neighboring city. In this case, the fluid used was port wine; it not only failed, but

caused a great degree of suffering. This patient spoke of the second operation as trifling in the amount of suffering when compared with the first.

Neither of these operations is adapted to all cases of hydrocele. In those which have been before operated on without success, or in which the tunica vaginalis is much thickened, or there is reason to believe that the fluid is contained in cysts, there can, I think, be hardly a doubt that the operation by incision should be preferred. But in recent cases on which no operation has been performed, except, perhaps, that of puncturing, where the sac is but slightly, if at all, thickened, and where the disease is not complicated with anything else, it would not be right to resort to it without having first tried the effects of injection.

Of the different fluids used for this purpose, as alcohol of various degrees of strength, solution of the sulphate of zinc, tincture of iodine, and port wine, I prefer the latter. Three or four ounces of this undiluted, as recommended by Mr. Liston, I have found to answer very well.

Varicose Ulcers. — These ulcers, when situated on the leg, the usual seat of them, readily heal, if the limb be put in a proper position, and attention be given to the diet and the state of the bowels. But they are very apt to return when the patient resumes his ordinary pursuits and mode of life, unless something is done to remove the varicose state of the vein on which they are dependent. This can be effected radically only by obliterating its canal; and various means have been devised for this purpose. More than two thousand years ago the actual cautery was employed, and occasionally with success. But so severe and

hazardous a remedy was not likely to get into general use; and it has long since been laid aside.

Sir Everard Home advised the operation of tying the vein, and stated that he had frequently done it with perfect safety and success. But other practitioners were not equally fortunate; severe and alarming inflammation came on in many cases, and death was the consequence of it in several. The ligature of the vein, therefore, soon fell into disuse; and other means were resorted to, to effect the same object. Among these was the division of the vein, either with or without a division of the integuments above it. More recently, the passing a needle under the vein and applying the twisted suture; and the application of the lapis infernalis, as recommended by Mr. Mayo. These two latter methods seem to have the preference at the present day, though upon what ground I am at a loss to conjecture; for their advocates admit that they require great caution in their use, and that alarming and fatal consequences sometimes follow.

The principal danger to be apprehended from all these operations is inflammation of the vein; and it does not seem reasonable to suppose that a simple division of the vessel would be as likely to produce it, as tying it by means of a needle and a twisted suture, or the application of caustic. In all surgical operations of importance, veins are freely divided; and frequently, as in amputation of the thigh, those of a very large size; and how rare it is that any trouble arises from this cause. Nor have I ever known any ill effects to follow when it has been done for the cure of varicose veins; and yet this is an operation which I have frequently seen performed, and have frequently performed myself. The trouble which has been

said to arise from this cause was probably owing to the fact that the operation was done at an improper time, when the vein was in an inflamed and morbid state. As a general rule, it is best to defer it till the ulcer has entirely healed, and all the symptoms of inflammation have passed off.

The method proposed by Sir Benjamin Brodie, of dividing the vessel without dividing the integuments above it, would, perhaps, be the best, if we could be certain that the whole circumference of the vein were in this way divided. But in those cases in which this operation becomes necessary there has been so much previous inflammation of the vessel, that it often becomes closely connected with the surrounding parts, so that when we attempt to pass the knife under it we may merely transfix it, and make a partial instead of a complete division of the vessel. This would necessarily prevent the success of the operation, and could not be known unless the integuments above were divided. I cannot believe that their division enhances the danger in any considerable degree, especially as I have never seen any bad effects follow it.

In either method a compress should be placed upon the part where the division is made, a roller applied from the foot to the middle of the thigh, and the limb kept in a state of entire rest, in a horizontal position, till the wound has healed.

Within the last two or three years, the operations for varicose veins, by the needle and twisted suture, and by caustic, have been several times performed at the hospital. The symptoms that followed were much less severe than I had anticipated; some of the patients hardly suffered at all, and in one case only was there any very serious in-

flammation. The vein was not, however, in every instance obliterated. How these operations would compare, in this respect, with that of division, I am unable to say; for I have not seen a sufficient number of cases to enable me to make a comparison that would be of any value. I should infer, *a priori*, that dividing the vein would more probably cause its obliteration than any of the other means; and, with my present knowledge, I should regard it as more safe.

The following operations were performed; these were done by my colleagues, Drs. Warren and Townsend,* and myself, it being the practice at the hospital for each of the surgeons to perform a part of the operations throughout the year:

Amputation of toes	2
" " finger	1
Division of tendo-Achillis (club-foot)	9
" " sterno-cleido-mastoid muscle (wry-neck)	1
Hydrocele by incision	3
Operation for varicose vein, by needles and twisted sutures	1
Removal of scirrhous breast	1
" " cancer of the lip	1
" " encysted tumor from the neck	1
" " malignant tumor from the neck	1
" " steatomatous tumor from arm	1
" " hydatid tumor from thigh	1
" " a part of the clavicle, necrosed	1
	24

The patients on whom these operations were performed all did well, and recovered from their effects so as to be

* A third surgeon was appointed to the hospital in February, 1839.

able to leave the hospital; though it can hardly be doubted that, in some of the cases, the disease for which the operation was performed would return.

The number of operations was quite as large as the average for the same period of time; but they were not in general of so important a character as those which have been frequently performed there in former years.

Boston, *April* 18, 1842.

REPORT

OF THE PERMANENT CURE OF REDUCIBLE HERNIA. MADE AT RICHMOND, VA., IN MAY, 1852.

The Committee of the American Medical Association, on the Permanent Cure of Reducible Hernia, beg leave respectfully to report:

That they addressed a number of questions to their professional brethren throughout the country, in the hope that they might in this way gain such information on the subject of their commission as they would not be likely to obtain in any other. They regret, however, to be compelled to state that they have received but seven answers; and that, though some of these are interesting and valuable, they still do not throw so much light upon the point to be investigated as they had hoped to derive from this source.

The first of them, from Royal A. Merriam, M.D., of Topsfield, Mass., is occupied by the details of an operation for femoral hernia in which a portion of the omentum was removed. The patient recovered, and lived twenty years without any further protrusion. It is not stated whether a truss was afterwards worn or not.

It seems to have been a common case of operation for strangulated femoral hernia, in which the omentum alone protruded. This operation, it is well known, sometimes effects, though very rarely, a permanent cure. It is also well known that the hernia much more frequently returns, unless other means are adopted to prevent it.

The second answer is from George W. Hinman, M.D., of Derby. It gives the history of a case of reducible inguinal hernia, in which the sac was laid open, and the inside of it "brushed over with the tincture of iodine," the contents of the sac having been, of course, previously returned into the abdomen. The patient did well, and there had been no return of the hernia at the time the letter was written, — a year only after the operation; a period not sufficiently long to enable any one to say that the cure would be permanent. It is not stated, either, whether the patient continued to wear a truss.

The writer of the third answer, George O. Pond, M.D., of Griggsville, is confident that he has effected a cure by means of pressure, in a number of cases of inguinal hernia. Stagner's truss is the instrument by which the pressure has been applied; and of twenty cases he thinks that seven eighths have been permanently cured. That pressure is one of the most important modes of treating hernia, with a view to a radical cure, there is no doubt; and upon this point the committee will take occasion to speak hereafter. Though there is nothing new in this communication, it is, nevertheless, valuable, as it affords additional evidence of the power of one of the means employed to remove this infirmity.

The writer of the fourth letter, George Heaton, M.D., of Boston, has devoted himself pretty extensively to the

treatment of reducible hernia, and had given notice to that effect, from time to time, for some years, in medical and other publications. It came to the knowledge of your committee that two or three individuals regarded themselves as cured by his treatment; and, as he was a member of the profession of regular standing, it was supposed that he would cheerfully state his peculiar method, if any such he had, of managing such cases. The committee, therefore, sent him not only a copy of the questions which they had addressed to the profession at large, but they also wrote him a private note, couched in the most respectful terms.

To this he made a courteous reply, but at the same time declined giving the information sought for. Not content with this, he caused the note addressed to him, and his answer, to be printed in several newspapers; which has, in our opinion, given him a notoriety, wherever the transaction is known, of a very unenviable character. It is certainly an unusual course for a member of our profession to conceal from his brethren any method of treatment which he may regard as more valuable than those in common use; and it is clearly one which cannot be too strongly reprobated by all honorable and high-minded men.

The fifth communication, from John Watson, M.D., of New York, was an account of an operation for the radical cure of an inguinal hernia by injection. The writer adopted the subcutaneous method, as recommended by Dr. Pancoast.

The result was favorable, but a sufficient length of time had not elapsed to enable any one to say that the beneficial effects will be permanent. The operation was done about ten weeks before the letter was written.

A part only of the sixth answer, from Professor Alden March, of Albany, was strictly in reply to the questions proposed by the committee. Much the larger portion was occupied by a history of eleven cases of strangulated hernia, for the relief of which an operation was performed; and in eight of these the writer believes that a radical cure of the hernia was the consequence.

The remaining portion contains an account of four cases of reducible hernia, in each of which the writer performed the subcutaneous operation by injection, but in none of them was a radical cure produced.

The seventh and last communication, from Professor Paul F. Eve, of Augusta, Ga., gives an interesting history of two operations, on a boy of ten years of age, for reducible inguinal hernia, supposed to be congenital. The first operation was that of Bonnet, by means of pins, which was unsuccessful, and, at the end of a month, "a portion of the scrotum was invaginated." After adhesion took place, one of Chase's trusses was applied. The patient continued well for eight months after the last operation, and the operator thinks that he has reason to believe that the cure will be permanent.

This, from the age of the patient, would be very likely to be the result of any method which should prevent, for a year or more, the descent of the hernia.

While the committee would express their grateful acknowledgments to the individuals who have made the communications which have just been referred to, they, at the same time, do not feel that all the information has in this way been obtained which the association have a right to expect. They have, therefore, looked to other sources, in addition, to aid them in the preparation of their report;

and they will now state, as briefly as they can, what has been done in relation to the radical cure of reducible hernia, and the opinions they have formed on the subject.

It is hardly necessary to go into a detailed history of the various methods that have been employed, for the last eighteen hundred years, for the permanent cure of reducible hernia. A very interesting and condensed account of them may be found in a dissertation, by Henry Bryant, M.D., of Boston, on "The Radical Cure of Inguinal Hernia," published during the present year, and for which the Boylston Prize was awarded to the author in the year 1847.

All the operations that have been practised for this purpose, till within the last fifty years, have been of a severe character; some of them dangerous, and, in many instances, death has been the consequence. *Cauterization*, *ligature*, *sutures*, *excision* of a *part* or the *whole* of the *sac*, and *castration*, were the principal operative methods in use for eighteen hundred years. The object of all of them was to obliterate or contract the neck of the sac, and thus prevent the protrusion of any of the abdominal contents.

Cauterization. — The caustic was applied to the skin just over the external ring in inguinal hernia, and immediately below Poupart's ligament in femoral. Sometimes the actual and at others the potential cautery was used. It was not unusual to make several applications of the caustic, so as to destroy the skin, sac and periosteum, in inguinal hernia, and thus produce an exfoliation of the bone. When the eschar separated, the part was dressed in the same way as a common ulcer. This was the method adopted by the ancients in the performance of this barbarous operation. Monro, and some other practitioners of

modern times, modified it by making an incision in the first instance, and exposing the neck of the sac, and then applying the caustic. They thought that they thus increased the chance of success, and, at the same time, lessened the danger.

But even when modified in this way the most disastrous results often followed it. The spermatic cord was not unfrequently destroyed; the intestine was sometimes perforated; and in many cases death ensued, either from violent and extensive sloughing of the scrotum, attended with severe constitutional irritation, or from peritoneal inflammation. And, in addition to all this, in several instances in which the patient survived this severe treatment the hernia reäppeared.

It is hardly necessary to add that no one at the present day could probably be found to justify, much less perform, such an operation. It is not, perhaps, surprising that the ancients, in their anxiety to relieve an infirmity which was so common, and over which, from their ignorance of anatomy, they had so little control, should resort to almost any method that held out a tolerable prospect of success; but it is wonderful that, after the repeated failures which followed it, as well as its often fatal results, it should have continued in use till modern times.

Ligature. — Ligatures were applied in different ways. One of the earliest methods was to pass a string around the integuments over the neck of the sac, its contents having been previously returned into the abdomen, and tying it so tightly as to cause all the parts below to slough. In inguinal hernia in the male, this, of course, destroyed the testicle.

Another mode was to pass a needle with a ligature

through the skin and around the neck of the sac, and then tie the ends of the ligature over a piece of wood placed on the integuments. The pressure could in this way be increased till sloughing was produced; and it was pretended by some who practised this operation that, if proper care was used, the sac only might be included in the ligature, and thus the testicle be saved. This, however, did not prove to be true; it was found that, notwithstanding the utmost precaution, the spermatic cord was so much compressed that the functions of the testicle were lost, even if the organ itself were not destroyed.

In order to obviate this difficulty, the operation by the "punctum aureum," as it was called, a ligature of golden wire, was suggested and practised. An incision was made in the integuments, the sac laid bare, and a needle, armed with a wire of gold, was carried under the neck of the sac near the external ring. The ligature was tightened from time to time, and it was thought that the neck of the sac might in this way be sufficiently closed to prevent the return of the hernia, without destroying the spermatic cord. But such was not the fact.

The same operation was performed with a common ligature, and sometimes with one of lead. But in all these methods so much pressure was made on the spermatic vessels as to produce an atrophy, if not an entire destruction of the testicle; and this circumstance, probably, more than anything else, led to the operation by

Suture. — This method, because it did not destroy the virility of the patient, and would not consequently deprive him of the power of increasing the king's subjects, was called "the royal stitch."

There were two modes in which this operation was per-

formed. The first step in both was to return the contents of the hernial sac. This being done, in one method a needle armed with a ligature was passed through the neck of the sac, which was sewed up by the continued suture, as is done in wounds of the intestines. No incision was made, but the needle was carried through the integuments.

In the other method, the hernial sac was first laid bare, the continued suture was used in the same way, and then a part or the whole of the sac below the suture was removed. In both cases the thread was allowed to remain till it was thrown off by the process of ulceration.

This operation could only be used in inguinal hernia. It was by no means uniformly successful; it was difficult to perform, when the sac was to be dissected away; always severe and dangerous, and oftentimes followed by death. For these reasons, it is not practised at all at the present day, but is reprobated by all modern surgeons who have had occasion to speak of it.

Excision. — Excision of a part or the whole of the hernial sac was another of the operations that was in practice, till comparatively modern times, for the radical cure of the reducible inguinal hernia. When the first method was adopted, the contents of the sac being previously returned, a portion of the covering of the hernial tumor, including the integuments and hernial sac, was cut away just below the external ring. The parts were then brought together and allowed to heal; and it was thought that such a contraction would be produced in the mouth of the sac as would prevent any further protrusion. This, however, was rarely the case. The operation, too, was necessarily a severe one; fatal peritonitis frequently followed it, and in many cases death ensued from a wound

of the viscera, which adhered, as they often do, to the neck of the sac.

The removal of the whole or the greater part of the sac was a still more severe and dangerous method, and at the same time equally uncertain. Probably because fatal hemorrhage was by no means an unfrequent consequence of this operation, a modification of it was practised, but with very little if any more success. This consisted in making an incision from the neck to the bottom of the sac, and then removing a portion of it on each side, the whole length of the incision.

Another operation, which was practised to a great extent and for a long period, though not so dangerous but far more unwarrantable than that of excision, was *castration.*

This was done occasionally with the knowledge of the patient, but more frequently without. Till within a very recent period, most persons afflicted with hernia, especially inguinal, have been anxious to conceal the fact, from the erroneous opinion that it impaired, if it did not destroy, their virility. They were willing, therefore, to submit to almost any severe method of treatment that would relieve them of their infirmity. But it is hardly to be supposed that they would consent to the removal of one of the genital organs, because they apprehended a loss of its functions, any more than they would commit suicide to escape death.

It is well known that various operations were performed for the radical cure of the reducible hernia by ignorant persons, oftentimes unprincipled charlatans, who were not very scrupulous as to the means they adopted. Finding that their other methods failed very frequently, and in many instances caused death, they thought that castration

would be more likely to produce a cure, and at the same time be far less dangerous. They pretended only to make a free incision in the sac, and declared that when the wound was healed the neck of the sac would be so much contracted that a permanent cure would be the consequence. That most of these operators had no confidence in this statement, is apparent from the fact that, after making the incision, they proceeded to divide the spermatic cord and remove the testicle; and such was the ignorance of many of them, that in numerous cases the patient died from the loss of blood. To such an extent was this barbarous operation carried at one time, that, in some parts of Europe, penal laws of the severest character were enacted to prevent it, and its performance for the cure of hernia was in some countries made a capital offence.

It was done oftentimes by uneducated, itinerant operators, some of whom not unfrequently were females, not only for the cure, but for the prevention also, of hernia; and for this purpose thousands of children have been subjected to this mutilation.

The danger of the operation, and its frequent want of success, may perhaps be in some measure attributed to the unskilfulness of the operators; but it often failed of effecting a cure, and sometimes caused death, when practised by the most expert. Notwithstanding all this, and in defiance of the law, there were found individuals who continued to practise it for this purpose till within the last sixty years.

It is certainly remarkable that inguinal hernia should return so frequently as it is said to have done after castration; but we have the authority of Sabatier for saying that it was not more effectual in removing the difficulty

than the application of caustic, the golden ligature, and some of the other methods that have been already noticed.

This fact should teach us not to place too much reliance on any of those operations that are intended to produce a partial or complete closure of the neck of the sac; for, when the testicle was extirpated for the cure of hernia, the whole sac was sometimes removed by passing a ligature around it just below the external ring, which caused the parts below to slough, and yet the hernia occasionally again protruded.

The severity, danger, and frequent failure of these operations, at length caused all of them to be abandoned; and Mr. Lawrence said, with great justice, in his treatise on hernia, more than five-and-thirty years ago: "Since the enlarged state of the tendinous opening is not removed by the processes adopted for a radical cure, since a recurrence of the disorder is not prevented, we may assert, without hesitation, that these operations do not afford any greater chance of complete relief than the employment of a truss."

The committee will next inquire whether any of the numerous methods that have, from time to time, since that period, been suggested and put in practice, have been attended with a greater degree of success. They will not go into a minute detail of all of them, but will present such a general view as will, they trust, make apparent the ground on which their opinions rest.

It should be remarked that none of the modern operations for the radical cure of hernia are as severe as the worst of the older ones of which we have already spoken; though some of them, it must be admitted, are very objectionable on this account.

It should also be observed that the mere fact that so many have been suggested and tried, and that none of them have been received with a great degree of favor, or, if so, that they have not retained it for any considerable length of time, is strong presumptive evidence that there is either an inherent difficulty in the nature of the infirmity which is intended to be removed by them, or that the means of accomplishing it have not yet been discovered.

It is well known that most of these operations have been devised for the radical cure of inguinal hernia, as this is the most frequent form, and the one which is, on the whole, productive of the greatest inconvenience. The object has been to close either wholly or in part the neck of the sac, or plug up, without contracting, the tendinous openings through which the hernia escapes. It has been attempted to accomplish both these in various ways.

In some operations that have been performed for omental hernia, whether strangulated or merely irreducible, a portion of the omentum has sometimes been left in the inguinal canal, under the belief that the adhesions which it would form with the surrounding parts would prevent any future protrusion. Several surgeons have reported cases as successfully treated in this way; but it is not stated for how long a time the patients enjoyed this immunity, and it cannot therefore be known whether the cure was permanent.

One of the committee is able to state a case which came under his own observation, and which, in his opinion, has an important bearing on this point. A healthy young man underwent an operation for irreducible omental hernia. All the omentum beyond the external ring was cut off;

the inguinal canal was plugged up by the omentum, which was closely adherent to it; and it was remarked at the time that the patient would never probably be troubled with hernia again. Within two years of that period, he was obliged to submit to an operation for strangulated enterocele on the same side. The very circumstance that was supposed to be sufficient to relieve him permanently was probably the cause why the hernia could not be returned by taxis.

It has been attempted to close the external ring by forcing the testicle into it, and then bringing on such a degree of inflammation as would be likely to retain it there by the effusion of fibrin. Sometimes this has been done without making an incision in the integuments, and at others the testicle has previously been laid bare.

This operation is certainly not admissible. It is unsafe; it is not probable that the testicle could be kept either at the external ring or within the inguinal canal; if it could, it would, no doubt, be a source of great inconvenience and irritation; and, in addition to all this, it would not, in all probability, prevent the return of the hernia, but would, on the contrary, rather facilitate it.

It has been attempted also to close the external ring and inguinal canal by means of the hernial sac. This operation has been done by Petit and Garengeot. The sac is first exposed; a portion of it is then crowded into the inguinal canal, under the expectation that adhesions would be formed between them sufficiently strong to prevent any subsequent descent of the hernia. This method is, perhaps, less objectionable than the preceding one, on the score of danger to the patient, though by no means entirely free from it; but is not any more likely to effect a

cure. There is no reason to believe that it is performed by any one at the present day.

M. Gerdy has practised an operation which consists in crowding the integuments into the inguinal canal, and removing the cuticle from them by means of caustic alkali. This is what has been called by the French "invagination by the integuments." Some modifications of this method have been suggested by M. Leroy and M. Signorini, but, from what we have been able to learn, we do not deem it of sufficient importance to give any detailed account of it.

M. Velpeau states that he performed it once unsuccessfully; that it had been done by M. Gerdy upon thirty patients; and that, though many of them seemed for a time to have been cured, a sufficiently long period had not elapsed to enable any one to speak with confidence of the ultimate result. He also adds that he had seen three of the persons who had been thus operated on, and who thought for some time after the operation that they were cured, in all of whom the trouble had returned precisely as it was before.

The truth seems to be that the adhesions which may be formed between the integuments and the interior of the canal are not very firm, and that, though they may for a time prevent the descent of the hernia, yet, as they are gradually absorbed, no resistance is at length offered to it.

M. Velpeau observes that, though it is not actually a dangerous operation, there is some risk of wounding the epigastric artery, and there is some reason, too, to fear severe phlegmonous inflammation or fatal peritonitis.

M. Belma's operation attracted for a time some degree of attention, as it was less severe than that of M. Gerdy,

and would, it was at first thought, be in all probability more successful. His first method consisted in introducing a small pouch of goldbeater's-skin into the upper part of the hernial sac. This was followed by an effusion of fibrin, which he supposed would, together with the goldbeater's-skin, become organized, and, the two sides of the sac being firmly glued together, must necessarily prevent any subsequent protrusion of the abdominal contents.

He afterwards modified his operation, because he found that his success did not equal his expectations. This he attributed to a deficiency of inflammation; and, with a view of increasing this, he introduced into the neck of the sac, as near the external ring as possible, small rolls of gelatine covered with goldbeater's-skin. There is no reason to believe that the result of this proceeding was any more favorable than that of the other. The operation has fallen into disuse. M. Velpeau says that the hernia returned more frequently after it than after that of M. Gerdy.

Dr. Jameson, of Baltimore, has given a description of an autoplastic operation which he performed on a female for crural hernia. The committee have not seen the original account of the case, but have derived their knowledge of it from the statements that have been made in the works of others.

The sac was laid open, and the crural ring was filled up by a portion of the integuments, which were cut into a proper form and inverted. This was confined in its situation by sutures. Adhesion is said to have taken place, and the patient was regarded as cured.

Admitting that there was no danger in the operation, it is certainly not probable that any union would take place

between the integuments and the ring that would be permanent; on the contrary, it can hardly be doubted that the fibrin effused in the first instance would be gradually absorbed, and that a protrusion of some of the abdominal contents would ere long again take place.

It is believed that this operation has not been repeated; or, if it has, the result, so far as we know, has not been made public. This fact would perhaps justify the inference that the relief obtained by the patient on whom Dr. Jameson operated was not permanent; otherwise, it would be difficult to explain why a similar operation should not have been adopted in other instances.

M. Graefe has described a very barbarous mode he took to bring on inflammation in the inguinal canal, with a view to the radical cure of hernia. It has no advantage over the old and justly reprobated operation of the excision of the sac, while it is almost as severe, and far more dangerous. It consists in laying bare the neck of the sac at the external ring, cutting it off at that place, and then introducing a piece of lint, smeared with some stimulating ointment, into the inguinal canal, carrying it up to the internal ring, or even beyond. One end of a piece of string is to be tied around the lint, and the other end is brought out at the wound. When suppuration is well established, the lint becomes loose, and can be readily withdrawn. This is said to take place usually in three or four days, and the amount of inflammation that is induced would be sufficient, it was thought, to prevent any future descent of the hernia.

This operation has been performed, it is said, with success, in a few cases; a result certainly not to be looked for, and the expectation of which would not justify any

man, who had a proper regard for human life and his own reputation, to repeat it.

The introduction of a seton has been recommended as a likely means of closing the neck of the sac. It has been advised to keep it in till suppuration comes on, and then withdraw a part of the threads daily, till all of them are removed. It was supposed that in this way adhesion might be produced between the opposite sides of the sac.

It is not probable, from what we know of its effects in hydrocele, that this would succeed; and it is much more probable that it would bring on such a degree of inflammation in the peritoneum as would terminate in death. From what is known of the laws of inflammation, there is much more reason to suppose that the suppurative process, rather than the adhesive, would be induced by this long-continued irritation; so that, while the patient would be exposed to great hazard, he would have but a small chance of a cure.

M. Bonnet, an eminent surgeon of Lyons, has attempted to close the neck of the sac by exciting inflammation in another way. From two to four pins, with double the number of small pieces of cork, are all the instruments that are required for his operation. The contents of the hernial sac having been returned, a pin, which has been passed through one of the pieces of cork, is then pushed through the integuments and the neck of the sac, as near as possible to the external ring, care being taken not to wound the spermatic cord. The pin is then brought out on the opposite side, and the point is carried through another piece of cork. Another pin is then introduced in the same way. Two are usually all that are necessary; but occasionally one or more additional ones may be re-

quired. The point of the pin which projects from the cork is seized with a small pair of pliers, and bent over so as to bring the opposite sides of the sac into close contact. This is done to all the pins; and this process is repeated from day to day, till it is thought a sufficient degree of inflammation is produced to cause adhesion. When this has taken place, the pins should be removed; and this is usually in from six to twelve days.

M. Mayor, of Lausanne, has modified this operation by using needles instead of pins, carrying in this way ligatures through the neck of the sac, which are afterwards tied over pieces of sponge. These can be tightened as much and as often as may be thought necessary to produce the desired effect. The number of ligatures required for this purpose must depend on the size of the hernial sac.

These operations are not attended with much danger, and are by no means difficult to perform. At the same time, they offer but little prospect of a successful result. They are insufficient for the purpose for which they are intended. They do not obstruct in any degree the inguinal canal, and even when most successful they only partially close the neck of the sac.

For these reasons, probably, if not for others, they have fallen entirely into disuse, not being resorted to even by the inventors of them.

Acupuncture has been tried, to a very considerable extent, both in Europe and this country. Two or three rows of punctures were made through the integuments and the neck of the sac, just below the external ring, with a common needle of the ordinary size, or an acupuncture needle prepared for the purpose. There is no reason to believe that any permanent good effect has been produced

in this way, and it is not probable that any one tries this method at the present time with the expectation of producing by it a radical cure of hernia.

The same may no doubt be said of the *scarification of the inguinal canal*, as practised by M. Velpeau a few times, and the subcutaneous *scarification of the neck of the sac*, as performed by M. Guerin. Besides the utter inefficiency of these operations, there is, especially in the former, some danger of wounding the epigastric artery.

The operation by *injection* has been done in two ways. In one, the neck of the hernial sac is previously laid open, and the fluid then thrown in ; and, in the other, it is introduced by the subcutaneous method. The first is the operation as performed by M. Velpeau, and the other that of Dr. Pancoast, of Philadelphia.

M. Velpeau was evidently dissatisfied with all the operations that had been performed for the radical cure of reducible inguinal hernia ; but he was unwilling to believe that no remedy could be found for it. The success which so often followed the operation for hydrocele by injection led him to think that a similar course might produce the same results in the treatment of reducible hernia.

He accordingly performed the operation on the first favorable case that presented. An incision of an inch in length was made just below the external ring down to the neck of the sac ; this was opened with a bistoury, and a mixture of six drachms of tincture of iodine in three ounces of water was thrown in. An assistant compressed the inguinal canal, so as to prevent the fluid from coming in contact with the peritoneum above the ring. After the injection had been pushed around the various parts of the

sac, it was allowed to escape through the canula. No unpleasant symptoms followed; but the final result of the experiment has not, as far as we know, been made public.

M. Velpeau does not seem to have much confidence in the operation, and it is understood that he does not continue to perform it at the present day. He has probably learned that something more than the mere closure by the process of adhesion of the neck of the sac is necessary for the radical cure of hernia. The fibrin that is effused will in most cases be soon absorbed, so that the barrier which had been relied on to prevent the descent of the hernia will be entirely removed.

About the same time, Dr. Pancoast performed the operation, which is described in his work on "Operative Surgery." The hernial sac, its contents having been previously returned, was punctured with a small trocar passed through a canula. Having ascertained that the instrument was fairly in the sac, by the freedom with which it could be moved about, the point of it was then directed upwards so as to scarify the internal surface of the upper part of the sac. The trocar was then withdrawn, and half a drachm of the tincture of iodine, or an equal quantity of the tincture of cantharides, was thrown in slowly by means of a small syringe fitted to the canula. The canula was then withdrawn, and a compress was applied just above the external ring, and the pad of the truss, which had been put on before the operation, was brought down over the compress.

This operation was performed in thirteen cases, in one of which only were there any symptoms of serious inflammation, and these readily yielded to leeches and fomentations. On some of these patients a single operation was per-

formed, and on others, in whom the sac was large, several were required. All of them were evidently benefited at the time, but whether a radical cure was effected in any instance could not be ascertained, as nothing was known of the patients after a few months from the time of the operation. Whether Dr. Pancoast continues to practise it, we are unable to say.

This method has, in the opinion of the committee, all the advantages of that of M. Velpeau, while it avoids in a great degree the danger of peritoneal inflammation, to which patients are exposed by his mode. When the hernial sac is laid open, there is of course a direct communication between the abdominal cavity and the external wound. This alone would be likely to excite inflammation; and if, in addition, a part of the peritoneum is subjected to the action of an irritating fluid, there is reason to fear that the inflammatory process would not be limited to the sac, but that fatal peritonitis would be the consequence.

Admitting that these operations accomplished all that they were designed to do, it does not follow, by any means, that they would in every instance produce a radical cure. All that they could effect, if successful, would be to close the neck of the sac, without contracting the tendinous opening or ring. Sir Astley Cooper very truly says "that, although the original sac may be completely shut at its mouth by adhesion or perfect contraction, it is possible that another sac may be formed contiguous to the first." In fact, it is well known that sometimes the hernia has recurred after the whole of the original sac has been removed. Contracting or even closing the neck of the sac, is evidently, then, not enough; "something more," says Mr. Lawrence, "is required; we want a remedy that

should contract the tendinous opening; for while that remains preternaturally large, a new protrusion is a highly probable occurrence."

This has been attempted in two ways. The first is by scarification of the external ring in inguinal hernia, and the other is by means of sutures. The first of these is quite an old operation. Heister says that "some surgeons scarify the ring of the abdomen, or aperture through which the intestine prolapsed, together with the skin, in order to render the cicatrix more firm; by which means many have been cured of these ruptures, especially if they continue to wear a proper bandage for a considerable time afterwards. But I think that the operation may succeed better in infants than in adults."

It is perhaps enough to say, with regard to this method, that it has been occasionally tried, from time to time, for more than a hundred years, without a sufficient degree of success to gain the confidence of surgeons; and it is not to be overlooked that the danger of wounding the epigastric artery is no inconsiderable one; enough, at any rate, to deter all but the most expert from attempting to perform it.

The operation of closing the external ring by means of sutures is, we believe, quite a recent one. It is proposed by Thomas Wood, M.D., of Cincinnati, who states that he has performed it in three cases with success. His paper on the subject may be found in the last volume of the *Transactions* of this Association. It is certainly entitled to great consideration, not only from the importance of the subject, but from the candid manner in which he has treated it.

He says that his "experience is too limited to warrant

him in saying much in its favor; but he cannot refrain from expressing the opinion that it offers to the ruptured patient a better prospect of a 'radical cure' than any operation before proposed."

He thinks that all the preceding operations have failed because, from the nature of the texture concerned in them, the adhesions have not been sufficiently strong to prevent the descent of the hernia; and he founds his expectations of success from his method on the following considerations: "Tendons," he says, "when wounded, will unite again by a formation similar to their original structure."

"Tendon is a permanent, unyielding tissue, seldom ruptured by the strongest exertions of the body."

"If we can close the external ring by a tendinous growth, we may effect a 'radical cure of hernia.'"

We do not deem it necessary to go into the details of the operation; for these, we refer to the author's paper. But we would remark that it is by no means certain that tendons, when wounded, are united by a similar substance. Much light has been thrown on this point, within the last few years, by the numerous cases in which tenotomy has been performed; and the committee think that they are justified in saying that it has been ascertained that the divided edges of tendons are united by a substance less resisting, more elastic, and not so firm as the original texture of the tendon.

But, although this operation may not be found, on further trial, to be more successful than that of the scarification of the ring, yet, as it proposes to accomplish what has never been effected in any other way, namely, the contraction of the tendinous opening, it certainly, on this account, if no other, merits the careful consideration of the profession.

An operation similar to that of Dr. Pancoast, if not precisely the same, has been performed, to a considerable extent, in the neighborhood in which your committee reside. Many persons, it is said, have been cured by it; but we have not met with any one of them that has felt that the truss could be safely laid aside. In one instance which has come to our knowledge, an individual submitted to the operation, and thought himself cured. In a few months after, he gave up his truss, supposing that compression was no longer required; but in eighteen months from that time the hernia returned.

It is not pretended, however, that a cure may never be effected by this method, when all the circumstances of the case are favorable. It may happen, sometimes, when the hernia is small and recent, and when the patient is in good health and young, or has not passed the middle age of life; and it may, too, be of great advantage in some cases in which the hernia could not be kept up by the truss alone, as this operation would be likely to cause an abundant effusion of fibrin in and about the neck of the sac.

It is an unquestioned fact that reducible hernia is often cured in young subjects. It may be accomplished in them by various means; but it should not be thence inferred that the same course would uniformly produce like effects in adults.

It may be remarked that, in children, any method which can prevent the protrusion of the hernia for a year or more will, in all probability, produce a permanent cure. If the aperture through which the contents of the sac must pass can in any way be prevented from enlarging, while the viscera of the abdomen are increasing in size, it is obvious that a great length of time would not be re-

quired to render an escape of any of the abdominal organs difficult, if not altogether impracticable. We see familiar examples of this daily in umbilical hernia, which is brought on so often in infancy by whooping-cough and various other causes. *Compression*, it is well known, will in all such cases, if carefully practised, in a comparatively short period produce a radical cure; and it is a valuable agent in the management of reducible hernia at every period of life. It has been used from the time of Celsus to the present, and it has not unfrequently succeeded in producing the desired result. It is usually applied at the present day by means of trusses. Great improvement has of late years been made in their construction. It cannot be doubted that an instrument of this kind, when nicely adjusted, so as to cause no pain or inconvenience, and at the same time to compress the neck of the sac, may, if used for a considerable length of time, prevent in many cases the subsequent protrusion of the hernia.

It is well known that pressure upon a serous membrane, when carried to a certain extent, will cause an effusion of fibrin on its inner surface; and it was from a knowledge of this fact that, in former times, the method of treating aneurism by compression was adopted. This mode often succeeded in producing a radical cure, by closing the artery leading to the aneurismal sac. The practice has been revived with great confidence within the last few years, and the results hitherto have been equal to the expectations of its advocates.

In the treatment of hernia in this way, it is of the utmost importance that protrusion should not be allowed to take place at any time; "for if the hernia once descends during the wearing of the truss," as Sir Astley

Cooper well remarks, "the cure must be considered as recommencing from that moment." The truss, therefore, should be worn by night as well as by day.

It is important, also, that while the pressure is sufficient to prevent the descent of any of the abdominal contents, it should not be enough to cause any considerable degree of inflammation. This would not only require the truss to be laid aside altogether, but it would also stop entirely the effusion of fibrin. In inguinal hernia the pad should be so placed as to compress the inguinal canal; and at the same time great care should be taken to avoid pressing the spermatic cord against the pubis.

A radical cure will not be effected in this way, unless the compression is continued for a length of time. It cannot be reasonably looked for in an adult in less than two years from the time the truss is first worn; and it can hardly be expected at all in persons after the middle age of life, who are afflicted with a direct inguinal hernia of long standing. At the same time, more benefit is derived from compression in such cases than from anything else, and persons in this situation are not safe without it.

The committee beg leave to offer the following opinions as the result at which they have arrived after a careful examination of the subject committed to them.

I. That there is no surgical operation at present known which can be relied on, with confidence, to produce in all instances, or even in a large proportion of cases, a radical cure of reducible hernia.

II. That they regard the operation of injection by the subcutaneous method as the safest and best. This will

probably in some cases produce a permanent cure, and in many others will afford great relief.

III. That compression, when properly employed, is, in the present state of our knowledge, the most likely means of effecting a radical cure in the greatest number of cases.

A DISCOURSE

ON SOME OF THE DISEASES OF THE KNEE-JOINT; DELIVERED BEFORE THE MASSACHUSETTS MEDICAL SOCIETY, AT THEIR ANNUAL MEETING, MAY 31, 1837.

Mr. President and Gentlemen of the Society:

A practical subject seems to be the most suitable for this occasion. The design of the annual discourse is not so much to impart information as to elicit it; and this can be best effected by treating on some obscure point connected with our profession, and thus exciting further inquiry and observation.

There is not time for a full treatise on any subject; and, if there were, I do not feel that I could offer one that would be either new or instructive to those whom I have the honor to address. But it may be in my power to suggest some topics that may be thought worthy of further investigation; and I do not hope to do anything more than this.

Such, unfortunately, is the condition of the healing art, even at the present day, that there are many points, in all its departments, in which the pathology is obscure, the diagnosis difficult, and the method of treatment consequently uncertain. We look forward, it is true, with confidence, to a better state of things; already brighter pros-

pects are opening before us, and the philosophical mode of investigation that has recently been adopted in the science of medicine cannot fail, if judiciously pursued, to lead to the most auspicious results. But the dawn has only commenced, and it will yet be long before the darkness is altogether dissipated. This cannot be accomplished without the untiring and successive labors of many. The experience of no one man, however extensive it may be, is sufficient for the purpose. There is a duty, then, that devolves on all, from which no one should shrink.

Every one who hears me can, no doubt, call to mind many subjects, both in medicine and in surgery, that are still obscure; and among these I think that the diseases of the joints hold a prominent rank. I therefore propose to offer a few remarks on some of the morbid affections of the knee-joint. It will, of course, be in my power to make only a few suggestions on these diseases; but I trust they may lead others to a careful examination of them.

There are many reasons for examining this subject with great care. The joints are often diseased; sometimes as the result of injury, and at others the trouble comes on spontaneously. The frequency of these diseases may be, in part, owing to the exposed situation of some of the joints, rendering them liable to accidents and injuries of various kinds, and subjecting them to inconvenience from changes of temperature. But this cannot account for all of them. The extent and variety of their motions have, no doubt, some influence in the production of many of their morbid affections.

These affections, too, are usually obscure in their nature, and consequently difficult to manage. They are frequently insidious in their attack, and often obstinate in

their character; producing, sometimes, permanent lameness, and occasionally terminating in loss of limb or life.

From the great degree of obscurity that not unfrequently attends some of these cases, and from the unpleasant manner in which they occasionally terminate, regular practitioners are often led to abandon them altogether, and the patients are consigned to the hands of those who sometimes have more boldness than skill.

So great is this obscurity, that the same disease, as has been justly remarked, is known under a variety of names, indicating a difference of character; and several diseases of the articulations, differing essentially from each other in some respects, are often confounded under a common name. It is obvious that, under such circumstances, a judicious mode of treatment would not probably be adopted.

At first view it may seem singular that this class of diseases is not more readily understood, when we consider that the situation of most of the joints is such that we can examine them with great ease, and perceive at once any change in their form or size.

But it should be recollected, on the other hand, that the joints are complex in their structure, composed of parts which are dissimilar in character, and which are endowed with very different properties. These are the synovial membrane which lines the capsular ligaments, the articulating cartilages, and the bones. Each of these is, no doubt, oftentimes the seat of disease, while the other parts remain, for a time, wholly unaffected.

It would be an important step toward a better knowledge of the diseases of the joints, if we could decide, in every case, in which of these parts the disease began. This is by no means an easy task. Morbid affections of the joints do not cause death at an early period, and op-

portunities, therefore, are not afforded of making an examination of the parts at the beginning of the disease, unless the patient should be cut off by some other complaint. These cases have been so rare, or advantage has not been taken of all that have occurred, or perhaps from both these causes, it has happened that there is still much obscurity on the subject. We are not able to determine, in every instance, whether it be the synovial membrane, or the cartilage, or the bone, that is affected. It is, no doubt, true that all of them may be and very often are diseased; but it is highly probable that the disease begins in one part, and gradually extends to the others.

To Bichat, perhaps, more than to any other individual, belongs the credit of having first brought into practice the method of investigating disease according to the texture which is affected; though we perceive in the writings of Mr. John Hunter that the importance of this mode did not escape his penetrating mind. For its application to the diseases of the joints, we are indebted to Sir Benjamin C. Brodie;* and it may be regarded as the most import-

* This gentleman has done more to advance the knowledge of the diseases of the joints than any other individual. He first adopted the method of investigating separately the affections of the different parts of which the articulations are composed. By this means he has thrown great light on this obscure subject.

I have availed myself very freely of his suggestions. At the same time I deem it proper to say that I have advanced nothing of a practical nature that is not the result of my own experience; and I am happy to add that this has, in most instances, fully confirmed what he had before stated. The world is deeply indebted to him for his invaluable labors; and I hardly know a more useful, safe and judicious work, in the whole range of practical surgery, than his "Observations on the Diseases of the Joints."

ant step that has ever been taken on the subject. This plan I shall pursue in the remarks that I am about to offer; and shall speak of those diseases of the knee which I propose to notice, as they affect the synovial membrane, the articulating cartilages, and the bones.

1. Inflammation of the Synovial Membrane. — The synovial membrane, which forms the lining of the interior of the joints, has a close resemblance to the serous membranes. It differs from them, however, slightly in its functions; its office being to secrete the synovia, a fluid which is similar to serum, but which contains more albumen.

The synovial membrane is the frequent seat of acute inflammation. It arises sometimes from accidents, sometimes from exposure to cold, and occasionally it comes on without any assignable cause. It is most often met with in those joints that are least protected by the soft parts; and, consequently, it is supposed that changes of temperature have no small degree of influence in its production. It varies very much in intensity. In severe cases it is attended with great pain at its commencement, and the general system is much affected; the appetite being impaired or altogether lost, the secretions diminished, and the circulating system highly excited. It is most common in adults, and rarely occurs spontaneously in young children.

When the whole or the greater part of the synovial membrane is inflamed from the beginning of the attack, the pain is felt throughout the joint, and swelling comes on almost immediately. But when the inflammation is confined at the onset, as it often is, to one part of the membrane, the pain is also limited to that spot, but extends with the disease, which usually involves the whole

articulation. In this case the swelling is not discoverable at first.

There is something peculiar about the swelling. The whole joint is not swollen in the beginning; the enlargement is perceptible only in certain parts, as it arises, in the early stages, from an increased secretion of synovia, which distends the ligaments. It is, consequently, most apparent on the anterior and lower part of the thigh, under the extensor muscles, and on each side of the ligament of the patella. At this period, a fluctuation can usually be perceived; but, if the disease continues, the ligaments become so much thickened, by the deposition of fibrin, that it cannot be detected, and the form of the swelling is also changed.

If the inflammation be severe, the integuments are discolored at an early period; but it is no unusual thing to see this discoloration limited to a part of the joint, and not extending over the whole of it till the disease has continued for some days. In fact, I have seen some cases, and those not of a very mild character, in which there was only a slight redness on a circumscribed spot during the whole course of the affection. The color is somewhat peculiar, resembling the blush of red that is seen in the beginning of erysipelatous inflammation.

There are various modes in which acute inflammation of the synovial membrane may be said to terminate; or perhaps it would be more correct to say that there are various processes set up during its progress. These are, increased secretion of synovia; deposition of fibrin, producing a thickening of the ligaments, and occasionally loose flakes of fibrin are thrown out in the cavity of the joint; suppuration and ulceration of the synovial mem-

brane. These, of course, do not all take place in every instance; the disease is not unfrequently arrested at an early period, and the limb is restored to its former usefulness; the increased quantity of synovia, the only effect of the morbid action, being gradually absorbed. At other times, even when recovery takes place, a great degree of stiffness remains, owing to the thickening of the ligaments. And occasionally, even under the best treatment, pus is secreted in the cavity of the joint, and ulceration of the synovial membrane, in most cases, precedes, accompanies or follows, its formation. When this is the case, the articulating cartilages are also very apt to ulcerate; and, in a great majority of such cases, amputation is the only means we have of saving the life of the patient.

Perhaps there is no better example of the formidable symptoms which sometimes accompany acute synovial inflammation than what is occasionally seen as the consequence of a wound through the capsular ligament of the knee-joint. It is, no doubt, true that this accident often does well, the wound healing readily by the first intention. But it is also true that a simple incised wound of the knee, which penetrates the joint, will sometimes be followed by the most disastrous consequences. If life and limb are saved, permanent lameness may be the consequence, even though the patient is in good health at the time of the accident. In cases of this kind, suppuration takes place not only in and about the articulation, but abscesses form at some distance from it, both on the thigh and leg. The constitutional symptoms are severe; the pain is excruciating; there is an entire loss of appetite, with great prostration of strength; and hectic fever, with night-sweats, comes on at an early period. At such a time, an opera-

tion seems to offer the only chance for the life of the patient; and yet the condition of the soft parts is frequently such as to forbid its performance.

It should, however, be remarked, on the other hand, that, notwithstanding these unfavorable appearances, such cases sometimes ultimately do well. If the system has not been broken down by intemperance or previous disease, there is still hope that its powers may rally; and amputation, therefore, should be deferred as long as it can be done with prudence. If recovery takes place, the limb will be stiff for some time, if not permanently; and yet it occasionally happens that its powers of motion are, by degrees, almost entirely restored.

Acute inflammation of the synovial membrane sometimes comes on in consequence of rheumatism, gout, syphilis, or the excessive use of mercury. In either of these cases, it is not so severe, and the pain is less acute, than when it is strictly a local disease, arising spontaneously, coming on from injury. It also yields more readily when properly managed.

The *treatment* of acute synovial inflammation is principally local. Though entire rest of the limb is very important, it is hardly necessary to direct it, as motion gives so much pain that the patient has no disposition to move the part.

Topical bleeding and cold lotions are among the most powerful means of preventing suppuration; but if, notwithstanding their use, this takes place, warm poultices and fomentations must be substituted for them. In severe cases general blood-letting is sometimes necessary; and in every case purgatives are useful, and a mild, liquid diet, small in quantity, and slightly nutritious, is the best, as

well as the most agreeable. Counter-irritation should be used, if the swelling continues after the active inflammation is subdued.

Sometimes, in this affection, all the symptoms are mitigated, but the disease still remains, and assumes a chronic, or perhaps it would be more proper to call it a subacute form. This form is not unfrequently seen without having been preceded by severe inflammation, especially in persons of a scrofulous habit, or those who have a taint of syphilis in the system, or are affected by rheumatism, or have taken mercury freely. We often see it, also, in consequence of injuries of the knee, and particularly of those in which the ligaments have been twisted. The suffering at the time of the accident is, perhaps, slight, and the pain usually subsides altogether in a few hours, and rarely continues more than two or three days. Not long after this, the patient finds that the limb easily becomes tired, and that, when he has used much exercise, there is a slight degree of tenderness about the joint, though but little, if any, pain. This does not come on at any precise period after the injury; it sometimes occurs within one week of the accident, and at others not under six.

The inconvenience is, in most cases, so trifling, for some time, that professional advice is not usually sought at an early period. The swelling is rarely considerable at any time in the course of chronic inflammation of the synovial membrane, unless it be complicated with syphilis, gout, or rheumatism. Under such circumstances, the joint will sometimes be not only more swollen, but also more painful. Whether this be universally true or not, I am unable to say; but I have seen it in several instances, in which subacute inflammation of the knee was at first brought on

by an injury, and the difficulty kept up and aggravated by one of the diseases just named.

It would seem, then, if this view of the subject be correct, that where synovial inflammation is modified by syphilis, rheumatism or gout, it is less severe than the worst species of the acute form of the disease, and more so than that of the chronic. But it may also be added, that when thus modified it is less likely to terminate in suppuration, and the consequent destruction of the joint.

Much time is required for the successful treatment of this class of morbid affections. The skill of the surgeon is often baffled by the unwillingness of the patient to submit to the proper remedies; and among these rest holds a prominent rank. In fact, without it the other means can do but little.

The lameness is so slight, that the necessary confinement becomes irksome; and yet the least exercise of the limb, or the slightest motion of the joint, in the early stages, is sure to aggravate the difficulty. It is essential, then, to insist upon keeping the limb in a state of entire rest at this period.

If there should be any pain, or much tenderness, local bleeding, by leeches or cupping, should be used; the latter is to be preferred, as the blood can in this way be drawn quicker, and it also acts as a counter-irritant. It is usually necessary to resort to bleeding two or three times. This should be followed by the application of blisters; and it will be found that it is better to let them heal, and draw new ones, than to dress them with any irritating application. In this way they produce more effect on the disease, and less disturbance to the system.

At a later period, stimulating applications of various

kinds will be beneficial. Among the most important of these are a mixture of olive-oil and sulphuric acid, the tartar-emetic ointment, and the ammoniated liniment, with the tincture of cantharides. In those cases in which there is reason to think that the patient is affected with scrofula, some preparation of iodine combined with simple cerate may be advantageously employed; either iodine itself, or the hydriodate of soda or potash.

After the disease has been entirely subdued, a great degree of stiffness frequently remains, partly in consequence of want of exercise of the limb, and partly from a thickening of the ligaments. When this is the case, friction and passive motion of the joint should be cautiously tried; but they should be immediately discontinued, if they produce any pain. They may excite inflammation, and the formation of pus, and thus destroy the joint. I have seen cases of this kind in which amputation became necessary to save the life of the patient. It is true that, by bending the joint powerfully, and rubbing with great freedom, its motions may sometimes be sooner restored, and no bad consequences follow. But it is very certain that it is a course that is always attended with danger, and one which a skilful and judicious surgeon would never adopt. Moderate and long-continued friction should be employed, where any is proper; but it should never be used until the disease is subdued, and it may then aid in removing its effects.

The warm spout bath is also a valuable remedy in giving strength to the limb; it must, however, be used with the same precautions as friction, not to be employed till the inflammation is gone, and to be laid aside if it causes any pain.

2. Morbid Change of Structure of the Synovial Membrane. — The synovial membrane sometimes unde-

goes a change of structure of a peculiar character, which is not found to take place in any other part of the body. In fact, it is rarely if ever met with, except in the knee-joint. It consists of a deposition upon the membrane, and an alteration in its organization. This deposition is a pulpy, gelatinous mass, varying from the twelfth of an inch to an inch in thickness, in which may be seen white membranous lines. It is sometimes of a light-gray color, and at others of a reddish brown.

It is but recently that we have had any accurate description of this disease, and for our first knowledge of it we are indebted to Mr. Brodie. Before his time, it was confounded with affections that differed from it in many important particulars.

It attacks children about the age of puberty more than any other persons, and rarely affects those who have passed the middle age of life. Scrofulous patients are the most disposed to it. Injuries of the joint, and repeated attacks of inflammation, are thought to be among its exciting causes.

Its first symptoms are swelling and stiffness, without pain. It usually begins in one part of the membrane, and gradually extends to the others, till the whole becomes affected. It is for a long time attended with but little inconvenience, and there is no change of color in the integuments. The motions of the joint become by degrees more limited, and sometimes are altogether destroyed. The swelling increases, but its form is less regular than that which arises from synovial inflammation. It is also soft and elastic, and on a superficial examination it may be thought to contain fluid; but on a more careful one it will be discovered that there is no fluctuation.

The joint will sometimes remain stiff and swollen for many months, or even years, giving little or no pain to the patient; and in some few instances absorption of the effused matter takes place to a very considerable extent, and the limb is, in a great measure, restored to its original condition, a slight degree of stiffness and swelling only remaining. But this is a rare occurrence. It more often happens, after the disease has continued for some time, that inflammation takes place, attended with pain, though the pain is rarely of a very acute and distressing character. The general health, however, is soon affected; abscesses form in the joint, the articulating cartilages ulcerate, and the ends of the bone become carious. The removal of the limb offers the only chance of saving life; in fact, the operation is often necessary before the disease has gone so far.

This has been the case in all the instances that I have seen, and even amputation has not always been sufficient to save the patients. Though they may recover from the effects of the operation, they frequently die very soon after, from disease of some of the internal organs, — the lungs more often than any others.

It must be obvious, then, that this is a constitutional disease; and the mode of treatment should be influenced by this consideration. Great attention should be paid to the diet, which should be mild and nutritious, and to the state of the bowels. Exercise in the open air is important, if it can be taken without moving the limb. In fact, all those means are proper which are calculated to invigorate the system.

Our local remedies should be such as are likely to prevent the occurrence of inflammation; and if this comes

on, those should be employed which have a tendency to check it. It must, however, be regarded as a disease of a very formidable character; and though it may for a long time remain quiescent, yet when it takes on the inflammatory state, we have but little if any power of controlling it. It is true that there are some authors who do not regard the disease as so incurable as it is generally thought to be, and Mr. Scott has recommended pressure, with great confidence. This, however, has not succeeded in the hands of others; it has excited inflammation and pain, and thus hastened the progress of the complaint.

M. Lisfranc has, more recently, spoken highly of the advantage of moxa, and believes it to be capable of arresting, if not curing, the disease. Though it no doubt deserves to be tried, I should not feel very sanguine of a favorable issue.

Entire rest of the limb, with counter-irritation over the whole swollen surface, seems sometimes to check its progress. From its affinity to scrofula, iodine, in some of its forms, would be perhaps the best counter-irritant. Friction and motion of the joint can be of no advantage at any period of the complaint, and may hasten the result which it is our object to prevent.

3. Of Ulceration of the Cartilages. — The articular cartilages have but a small degree of vascularity. They are, consequently, little liable to disease; but, from the same cause, they are slow to recover when they once become affected.

It has even been doubted by some whether they are furnished with any vessels; and that peculiar condition in which they are sometimes found, and which is usually regarded as ulceration, has been thought to be a mere

mechanical abrasion; their supposed want of vascularity rendering it impossible for them to be the seat of inflammation.

But the mere fact that they are capable of growing, as we know they do, with the other parts of the body, renders it certain that they are supplied with blood-vessels. A higher degree of organization than they possess would unfit them for the office they are designed to perform; they would readily inflame and suppurate, if they had a greater degree of sensibility and vascularity.

Even as it is, they sometimes become diseased, and ulceration follows. When this process takes place in the soft parts, it is always attended with the secretion of pus; but this is rarely the case when it occurs in the articular cartilages.

The cartilages of the joints may ulcerate in consequence of a disease of the synovial membrane, or of an affection of the bones, or the cartilages themselves may be the primary seat of the disease. This latter affection, which must be regarded as the true ulceration of the articular cartilages, most often occurs in adults. Individuals who have been affected with rheumatism or scrofula are the most frequent subjects of it. It is attended with but little swelling at any time, unless it be complicated with synovial inflammation; and the joint is rarely, if ever, swollen at the commencement of the disease. The pain is deep-seated and gnawing, and much increased by pressing the articular cartilages against each other. It is felt before any swelling can be discovered. It is usually referred to one spot, and is more severe at night than at any other time. In the beginning of the disease, it is very slight, and always relieved by rest, and aggravated

by motion. It increases, however, in intensity, as the morbid affection advances, until it becomes very severe; and, in a few weeks from its commencement, a slight swelling may be discovered. This swelling takes place between the bones, and is supposed to be owing to the thickening of the cellular membrane, in consequence of the disease that is going on within the joint.

In some cases, the constitution suffers so much, though the limb is but slightly altered in appearance, that amputation is necessary. If the joint be opened, after the limb is removed, it will probably be found that the cartilage is ulcerated only to a small extent, without any other morbid appearance; or, at most, there will be, in addition, a small quantity of pus.

In other cases, an abscess is the consequence of this disease. This is followed by an ulceration of the ligaments, and also requires an operation. There is another class of cases, too, in which, after the morbid affection has continued some time, a restorative process is set up, and a partial recovery takes place. When the cartilage has been destroyed by ulceration, it is never restored, its powers of vitality are so feeble; but when the disease that has been going on in it has been arrested, the ends of the bone frequently unite either in partial or complete anchylosis; that is, either by ligament or bone. The joint, of course, is either partially or wholly stiff, and its motions, consequently, limited to a greater or less extent. But when the disease has not advanced so far, and recovery takes place, though the cartilages have been ulcerated, the limb is often restored almost to its original usefulness.

It is apparent, from what has been said, that this is a formidable disease, and remedies, unfortunately, have not

the control over it that could be wished. In its treatment, great attention should be paid to the general health, by regulating the bowels, and by strict attention to diet. As motion produces so much pain, the joint should be kept entirely at rest; and in order to insure this, the limb should be confined in a hollow splint, extending from the foot to the nates, or in some other mode that will entirely preclude all possibility of motion. So important is absolute rest, that some surgeons have relied upon it alone, in the management of the early stages of some of these cases, and have not unfrequently been completely successful.

Blood-letting, either general or local, is rarely required. But if there be reason to believe that the joint is inflamed from too much motion, or any other cause, topical bleeding will be useful. It seems to have no power, however, of arresting the ulcerative process, but only the inflammation, which is, as it were, accidentally superadded to it.

Our principal reliance must be in some form of counter-irritation. In mild cases, blisters, kept open by stimulating dressings, may be sufficient; but in more severe ones, resort must be had to issues, moxa, or the actual cautery. Which of these is to be preferred, and in what cases a preference is to be given to one over the others, it is, perhaps, not easy to decide. Issues, made by caustic potash, or other chemical agents, were, till recently, in most general use. Within a few years, however, moxa and the actual cautery have been again brought into practice; for both of these remedies were in high favor among the ancients for diseases of the joints.

The moxa and the actual cautery are probably the best counter-irritants, as they certainly are the most powerful.

The former I have used, but not the latter, principally from an apprehension that it might be difficult to limit its effects. My own experience has taught me, even when issues are to be made about the knee-joint, to be cautious in the selection of the spot upon which they are to be placed. I once saw an abscess produced within the joint, which rendered amputation necessary, by the application of caustic directly over the capsular ligament.

Whatever, therefore, be the agent that is employed, it is safest to apply it at some distance from the articulation; otherwise a degree of inflammation might be excited in the synovial membrane, that would essentially retard recovery, if it did not altogether prevent it.

It seems to be well established that the benefit derived from issues is not in proportion to the amount of suppuration which they produce, but is probably more owing to the powerful impression which they make on the part. Admitting the correctness of this opinion, there can hardly be a doubt that moxa and the actual cautery should be preferred to common issues, in cases of this kind, especially in adults; in children, the milder means may answer.

When the disease has been arrested, the stiffness may sometimes be lessened by gentle friction, passive motion, and the tepid spout bath. These should all be tried cautiously, otherwise they may excite an undue degree of inflammation.

4. Of the Disease of the Articulating Surfaces of the Bones of the Knee-joint. — The ends of the bones are sometimes the primary seat of disease. It begins in the cancellous structure, which becomes more vascular, and contains a less proportion of earthy matter than in health. Persons predisposed to scrofula are the most

frequent subjects of it, though they are by no means the only ones who are affected by it; and hence it is often called the scrofulous disease of the bones.

It most usually attacks children, and it is rarely met with after adult age. It often comes on in an insidious manner; a slight pain being occasionally felt in the joint, especially after exercise; and this state of things may continue for some length of time, before any swelling can be perceived. It is frequently attributed to injuries, though their influence in its production has probably been very much overrated. Changes of temperature, and exposure to cold and moisture, have a much greater agency.

When young children are the subjects of it, appearances of disease can usually be detected in other parts of the body; but when the patients have passed the age of puberty, the diseased joint is often the only affected part. After the joint begins to swell, it is not unusual to find some of the inguinal glands enlarged. The pain, however, continues trifling, and does not become severe till matter forms within the capsular ligament.

As the joint increases in size, — which it steadily does, though it is sometimes very slow in its progress, — exercise becomes painful, and the patient, with a view of favoring the limb as much as possible, keeps the knee bent, and brings the toes only to the ground in walking. In this way a permanent state of semi-flexion is produced; and it is a position which is found more comfortable than any other.

The swelling is distinguished by puffiness and elasticity; and though it attains an enormous size, the integuments covering it remain of their natural color. When the

tumor is very large, purple veins are seen passing over it, owing, no doubt, to the interruption of the venous circulation. The swelling, however, seems to be larger than it actually is, in consequence of the emaciation of the limb above and below it.

After the disease has continued for some length of time in the bone, it extends to all the neighboring parts; the cellular and synovial membranes become thickened and diseased, the cartilages ulcerate, and an abscess, perhaps, forms in the joint. When the pus is discharged, either by a natural or artificial opening, a new suppuration may take place, and hectic fever terminate the life of the patient, unless it be saved by an operation. But even this is not always effectual; the system may have received so severe a shock from the disease that it is unable to rally, and its powers sink under it.

But, on the other hand, it sometimes happens that after the pus has been discharged no new abscess forms; the wound slowly heals, and the morbid action seems to be altogether arrested. But, though the patient recovers in this case, the limb is rarely, if ever, restored to its former usefulness. The bones having been carious, and the cartilages ulcerated, the joint is stiff, in a greater or less degree. In some instances a solid osseous union takes place between the ends of the bones, forming a true anchylosis.

Sometimes the joint will continue enormously enlarged for many years, without the formation of an abscess. When this is the case, the general health is occasionally so much affected as to require the removal of the limb; at other times the system seems to participate but little in the local trouble. It is well ascertained that, though

the bones seem to be swollen from an early period of the disease, they are, in fact, not enlarged at any time during its progress. If a joint be examined after its removal, it will be found that all the parts are in a state of disease, and that the bone is softened to a very considerable extent. It seems, also, to be well settled that, though the bone is more vascular than in health in the early stages of this affection, it becomes less so in the latter ones; and hence, why the bone, at this period, is so prone to die and exfoliate.

The treatment of this distressing affection must vary somewhat in different cases, though it should not be active in any. The general health should receive our principal attention; and it is doubtful whether local means have the power of arresting or checking, to any extent, the complaint. The limb must be kept at rest, as motion is sure to aggravate the disease.

Local bleeding should only be used on the occurrence of active inflammation, and then the application of leeches may afford some relief. From the known affinity of this disease of the joint to scrofula, we should not be led to think that blood-letting could have any favorable influence over it; and experience has fully established the correctness of this opinion.

Counter-irritation, which was formerly so much employed in this complaint, is now almost wholly laid aside. It is not thought to have any power of preventing suppuration; though blisters are still sometimes used in the chronic form of the disease, merely with the view of retarding its increase in size.

Cold applications are among the best means to be used when the part is inflamed; if it becomes painful, fomenta-

tions should be employed; and mild poultices, when pus is secreted. The abscess should be allowed to open spontaneously; otherwise, an undue degree of inflammation will sometimes come on.

At this advanced period of the disease an operation is usually required; but, if recovery takes place, the limb will, in most cases, be stiff, and anchylosis cannot be accomplished, unless it be kept entirely at rest. Friction and passive motion cannot be safely used at any time.

I have thus noticed four important diseases of the knee-joint, which, though they differ from each other in their nature, symptoms and method of treatment, are often confounded under the common name of white-swelling. This term was first introduced into surgery by Wiseman, more than a hundred and fifty years ago, and was probably intended to indicate that disease of the bones that has just been noticed. It by degrees, however, embraced other diseases, until it included all those chronic swellings of the joints in which there was no discoloration of the skin, and which often terminated in the loss of the limb or the life of the patient. Though surgeons did not, till recently, know the exact difference in these morbid affections, they soon discovered that they were not precisely the same; and they therefore made a division of white-swellings, — a very loose and inaccurate one, to be sure, — into the rheumatic and the scrofulous.

It is not, however, so singular, as at first view it may seem to be, that diseases differing from each other as much as those do of which I have just spoken should be confounded under a common name. There is a close resemblance in their morbid appearances, when they have advanced to that stage that the removal of the limb is necessary to preserve the life of the patient. In each of

them we find, at this period, that the synovial membrane is thickened, and oftentimes changed in structure, the cartilages ulcerated, the bones carious, and not unfrequently a collection of pus in the cavity of the joint. But, though the mistake might easily be made, it is not the less important to avoid it, as the same treatment is not adapted to all of them. They can be discriminated by careful attention to the diagnostic marks of each; and, though I may not have described them clearly, they nevertheless have a real existence. It was my intention to trace only the prominent features of these diseases, in the hope of calling your attention to an obscure but important subject, and one which has too long been consigned to unmerited neglect. If I shall be fortunate enough to do this, my purpose will be answered.

Permit me, in conclusion, Mr. President, to congratulate you, and the Fellows of this Society, on the auspicious circumstances under which we have assembled. This institution has been incorporated almost sixty years; and, since its reörganization, in 1803, it has steadily advanced in prosperity and usefulness. Its members have increased from thirty — which was the whole number at its establishment — to almost six hundred; and we may indulge the hope that, before the return of another anniversary, it will find in its ranks every well-educated physician in this commonwealth.

It was founded for the purpose of raising the standard of medical education, of elevating the profession, and of guarding the public against the arts of the ignorant and designing. It has no sinister purposes to accomplish, and seeks no other aggrandizement than what it gains by increasing the acquirements and respectability of its members. It is capable of exerting a salutary influence on the

community and on the profession; and, if it fail to do this, it will be because we do not keep in view the objects for which it was established. It may, for a time, be misrepresented and misunderstood; but, if the members are true to themselves, and to the great objects for which it was founded, the benefits which it confers on the public will be felt and acknowledged by all. Let us cling, then, with affection, to our time-honored society, and, by acting up to its principles, we shall make it an instrument of good to our fellow-men, and a means of advancing the dignity and honor of our profession.

While there are many agreeable associations connected with this occasion, it cannot fail, also, to bring with it feelings of a melancholy character. Every year takes from us some of our number; and that which has just drawn to a close has called to their final account several esteemed and respected members of our society.

Some of them had passed long lives with an honorable reputation; and, after having devoted themselves faithfully to the interests of humanity, were gathered, in a ripe old age, "full of years and full of honors."

Others were in the vigor of manhood, rich in experience, active, faithful and intelligent, diligently exerting the powers of their minds, and diffusing their stores of knowledge, for the benefit of their fellow-men. In the midst of their usefulness, they were summoned, by an inscrutable providence, at a moment when their lives seemed to be of the most value to the world. And others, again, were called away when they were just entering on the great theatre of life, young and ardent, full of hope and promise; and thus were blasted, in a moment, the fond expectations of anxious friends. While we lament their loss, let us gratefully cherish their bright example and honorable name.

STATISTICS

OF THE AMPUTATIONS OF LARGE LIMBS THAT HAVE BEEN PERFORMED AT THE MASSACHUSETTS GENERAL HOSPITAL, FROM ITS ESTABLISHMENT TO JAN. 1, 1850.

Some years since, I published in the *American Journal of Medical Sciences*, at Philadelphia, a list of all the amputations of large limbs that had been performed at the Massachusetts General Hospital, from the time of its establishment to January 1st, 1840. I have now prepared another list of the same kind, embracing all similar operations that have been done there from that period to January 1st, 1850.

It seemed to me desirable that the first table should be reprinted in connection with that which I have just finished, so as to give at one view the result of all the amputations that have ever been performed at that institution. This will enable any one, who is curious in these matters, to make such an analysis of the tables as may be likely to throw light on the subject at large.

It is true that the number of operations is not sufficiently great to authorize any very general conclusions; at the same time, every addition of this sort is important, as contributing to the collection of facts from which valuable inferences may hereafter be deduced.

It is only within a few years that the statistics of amputations have attracted any considerable degree of attention; but what has already been done has wrought a great change in the opinions of surgeons as to the result of this operation. Mr. Benjamin Bell, who wrote nearly seventy years ago, thought that not more than one patient out of twenty died, on whom amputation was performed; and yet it has been ascertained that one out of four died in two thousand cases that occurred in civil practice in Great Britain, and one out of three in five thousand cases in various parts of Europe. Yet no one can suppose that the operation was better done, or the after treatment more judicious, in the time of Mr. Bell, than they are at present; for it is well known that surgery, in all its departments, has made greater progress within the last century than it had in all preceding time. The only explanation of this startling fact is, that there were formerly no records kept of the results of these operations; there were no data upon which such an opinion as that of Mr. Bell could rest, except what were derived from vague impressions. The memory is apt to be treacherous with regard to unfavorable cases; the successful ones are usually remembered, and too often published alone.

It is very desirable, therefore, to get as much information as possible on the subject; and, in order to do this, every one who has many operations of this kind, either in private or hospital practice, should publish them all, with their results. When a large amount of materials has been thus collected, a careful analysis of the whole will show, to some extent, no doubt, how far death, when it does take place after amputation, is attributable to the injury or disease for which the operation was performed, or to the

operation itself, or to some other circumstance. It will serve to guide surgeons in some measure in deciding upon the expediency of operating; under what circumstances it can be done with the best prospect of success, or when it should be deferred or avoided altogether. This course is now in successful progress, and it is to be hoped that it may be continued so long as the operation of amputation may be found necessary.

Statistics of the Amputations of Large Limbs that have been performed at the Massachusetts General Hospital, from its establishment to January 1, 1840 ; *with Remarks.**

The following table, it is believed, contains a list of all the amputations of large limbs that have been performed at the Massachusetts General Hospital since the establishment of that institution. Such particulars are added as were thought calculated to throw light on the subject. These, in a few instances, are not so full, perhaps, as could be wished.

This remark applies especially to some of the early cases, which occurred at a period when the records of the hospital were not kept with that precision that has since been adopted. The omissions, however, are not thought to be such as will impair, to any extent, the value of the table.

The statistics of amputation are very desirable. They may probably lead to practical results of some importance. From what has recently been published, it is evident that amputation is more often followed by the death of the

* From the *American Journal of Medical Sciences* for May, 1840.

patient than was formerly supposed. But to what extent this can be attributed to the operation itself, or to the disease or injury for which it was performed, cannot be precisely determined.

It has been stated that more than one half of all whose limbs are amputated at some of the hospitals of Paris die; and it appears, from a very valuable paper published by Dr. Norris, in the number of this journal for August, 1838, that of fifty-five patients, being the whole number on whom amputation was performed in the Pennsylvania hospital during a period of eight years, twenty-one died.

And yet these unfavorable results cannot fairly be attributed to the operation alone. There are a variety of causes that would exert a bad influence in the hospitals of Paris, that are not to be met with in those of our country. The former are more crowded, less comfortable, and badly ventilated in comparison with similar institutions here, and it is believed that the after treatment is not so faithful and assiduous as with us.

Dr. Norris has, no doubt, suggested the true cause of the large proportion of fatal cases in the Pennsylvania hospital, and that is that the operation was probably in many cases too long delayed, in the hope of saving the limb. No one can doubt, who knows anything of that institution, that nothing would be omitted which would be thought likely to add to the comfort and safety of the patient.

While it is, no doubt, true that amputation is sometimes too long delayed, it is equally certain that it is often performed when it might have been avoided. It is difficult in many cases to decide on the best course; but the operation should not be done without the clearest evidence of its necessity, for it is a hazardous and painful one, and

even when perfectly successful leaves the patient in a mutilated state.

It will be seen, by the subjoined table, that the results at the Massachusetts hospital were somewhat more favorable than those at the Paris and Pennsylvania hospitals, above referred to. In a large proportion of the following cases, the amputation was done by the circular incision; the flap operation was adopted occasionally, whenever there was reason to believe that a better stump could be made by it than by the other method. The dressings were always of a light and simple kind, consisting of two or three strips of adhesive-plaster and a small compress and roller; and yet there are some surgeons of the present day who would, perhaps, regard these as more cumbersome than was necessary.

If the bleeding was slight, the dressings were applied before the patient left the operating-room; but if there was anything more than oozing from the veins, it was deferred till a few hours after.

TABLE I. — *Amputations of Large Limbs at the Massachusetts General Hospital, to Jan.* 1, 1840.

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place of operation.	Result.	Time of discharge or death.
			1822.		**1822.**			
1	Francis Vanvactor.	60	Jan. 26.	Compound fracture of right leg.	Feb. 5.	Below knee.	Died.	Feb. 11, 1822.
			1823.		**1823.**			
2	Sarah Ann Newell.	42	Nov. 1.	Large ulcer inside of left knee.	Nov. 18.	Above keee.	Recovered.	June 21, 1824.
3	John F. Manco.	22	Dec. 19.	Frost-bite—both feet.	Dec. 20.	Below knee, both legs.	Recovered.	April 2, 1824.
			1824.		**1824.**			
4	William C. Stone.	16	March 27.	White-swelling 7 years, left knee, much bent.	March 30.	Above knee.	Recovered.	May 4, 1824.
5	Lawrence Ryan.	18	May 29.	Swelling 18 months, right knee.	June 17.	Above knee.	Died.	June 20, 1824.
6	William Littlefield.	30	Nov. 19.	Compound fracture of right leg—trismus.	Dec. 4.	Above knee.	Died.	Dec. 5, 1824.
			1825.		**1825.**			
7	Thomas Hooper.	21	May 22.	Abscess and fungus—right foot.	May 30.	Below knee.	Recovered.	July 30, 1825.
8	Moses Cheney.	57	Aug. 22.	Ulcerated tumor—right arm.	Aug. 27.	Above elbow.	Recovered.	Oct. 6, 1825.
9	Luther Haskell.	41	Nov. 25.	Tumor on tibia—kicked by a horse two years previous.	Dec. 17.	Below knee.	Recovered.	March 1, 1826.
			1826.		**1826.**			
10	Levi Stearns.	22	Sept. 4.	Knee swelled three years—unable to walk six months	Dec. 9.	Above knee.	Recovered.	Feb. 12, 1827.
			1827.		**1827.**			
11	John Currier.	18	March 27.	Ulcers on leg—knee bent.	May 9.	Above knee.	Recovered.	June 8, 1827.
12	Federal Burt.	34	April 7.	Fungus hæmatodes.	April 11.	Above elbow.	Recovered.	June 18, 1827.
13	Samuel G. Merrill.	8	April 8.	Swelled and stiff knee from injury, 3 months.	Dec. 8.	Above knee.	Recovered.	Dec. 14, 1827.
14	Margaret Twiss.	26	May 10.	Scrofulous disease of right elbow.	Mar.,1828.	Above elbow.	Recovered.	April 9, 1828.
15	Charles Richards.	30	Oct. 31.	Compound fracture of leg.	Nov. 10.	Below knee.	Recovered.	Jan. 15, 1828.
			1828.		**1828.**			
16	John Cleverly.	23	April 23.	Painful tumor of knee, ten years.	May 9.	Above knee.	Died.	May 18, 1828.
17	John Evans.	17	Nov. 18.	Compound fracture.	Nov. 19.	Above knee.	Recovered.	Dec. 26, 1828.
18	George Hatten.	24	Dec. 6.	Dislocation of patella—contraction of joint—exceedingly painful.	Dec. 20.	Above knee.	Recovered.	Jan. 28, 1829.
			1829.		**1829.**			
19	Abigail Day.	50	March 4.	Fungus hæmatodes.	March 5.	Above knee.	Recovered.	May 9, 1829.
20	James Dowsley.	27	May 15.	Compound fracture of leg.	June 3.	Below knee.	Died.	June 3, 1829.
21	Henry Mills.	23	May 29.	Comp., comm. and compl'd frac. leg and knee.	May 30.	Above knee.	Died.	July 4, 1829.
22	Fernando Worcester.	12	Nov. 18.	Severe injury of knee-joint.	Dec. 5.	Above knee.	Recovered.	March 15, 1830.

A Table of the Amputations of Large Limbs. — Continued.

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place of operation.	Result.	Time of discharge or death.
			1830.		**1830.**			
23	John Hatheway.	46	Jan. 27.	Ulcers on foot 20 years—on leg 10 months.	Feb. 11.	Below knee.	Recovered.	March 30, 1830.
24	Elias Hine.	49	Jan. 29.	Fracture of both bones of left leg.	Feb. 26.	Below knee.	Recovered.	May 8, 1830.
25	Richard Alley.	49	June 24.	Oblique fracture of both bones of right leg.	June, 1831.	Below knee.	Recovered.	Aug. 30, 1831.
26	Moses Chase.	23	June 24.	White-swelling of knee, three years.	Nov. 27.	Above knee.	Died.	Dec. 21, 1830.
27	Abraham D. Phillips.	43	Dec. 4.	Irritable ulcers from injury.	Dec. 18.	Below knee.	Recovered.	March 11, 1831.
			1831.		**1831.**			
28	Elijah N. Barker.	10	June 28.	Thigh crushed by an anchor.	June 29.	Above knee.	Recovered.	Nov. 1, 1831.
			1832.		**1832.**			
29	Robert Caswell.	13	Jan. 2.	White-swelling from infancy—injured 7 years after—limb useless.	Jan. 7.	Above knee.	Recovered.	Feb. 25, 1832.
30	Joseph Fernald.	26	March 21.	Knee strained six years before entrance—bones felt through fistula.	April 14.	Above knee.	Recovered.	July 13, 1832.
31	James Ryan.	27	April 25.	Integuments of leg crushed by wagon-wheel.	April 26.	Below knee.	Recovered.	July 17, 1832.
32	Benjamin Nourse.	57	June 8.	Ulcer around leg, 20 years.	Jan., 1833.	Below knee.	Recovered.	March 12, 1833.
33	Mary C. White.	27	July 9.	Abscess inside right knee, 23 years—constant discharge—bones carious.	November.	Above knee.	Recovered.	Jan. 14, 1833.
34	Charles West.	21	Aug. 23.	Injury of knee, subsequently great inflam.	Oct. 26.	Above knee.	Recovered.	Dec. 18, 1832.
35	Joseph Bragden.	37	Sept. 26.	Chronic disease and extensive caries of tibia.	Oct. 20.	Above knee.	Recovered.	Dec. 22, 1832.
			1833.		**1833.**			
36	Eliza Low.	21	Jan. 11.	Chronic inflammation of knee—health failing.	Feb. 2.	Above knee.	Recovered.	April 13, 1833.
37	Henry T. Spear.	19	March 2.	Deformed foot, ankle anchylosed and painful.	March 7.	Below knee.	Recovered.	April 10, 1833.
38	John Jordan.	26	May 8.	White-swelling.	May 16.	Above knee.	Recovered.	July 11, 1833.
39	Hannah M. Andrews.	23	Oct. 29.	Stiffness of right knee 4 y'rs—abscess 3 w'ks.	Dec. 28.	Above knee.	Recovered.	Feb. 19, 1834.
40	Hosea Sargent.	35	Dec. 25.	Fungus over ligamentum patellæ from blow two years before.	Jan., 1834.	Above knee.	Died.	Jan. 18, 1834.
			1834.		**1834.**			
41	Patrick Donnaha.	24	Jan. 29.	Foot crushed by railroad-car—same day.	Feb. 8.	Below knee.	Died.	Feb. 13, 1834.
42	Hannah Bray.	14	May 31.	Ab'ss on b'k right hand from blow 1 y'r before.	Nov. 8.	Below elbow.	Recovered.	Nov. 26, 1834.
43	Thomas Marshall.	25	June 20.	Right wrist lacer. by can., same day, face torn.	June 27.	Below elbow.	Died.	June 29, 1834.
44	Ephraim M. Spear.	37	Nov. 12.	Part of foot amputated three years before for frost-bite—stump not healed.	Nov. 15.	Below knee.	Recovered.	Dec. 17, 1834.

A Table of the Amputations of Large Limbs. — Continued.

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place of operation.	Result.	Time of discharge or death.
			1835.		**1835.**			
45	James Neal.	29	April 3.	Left hand shat. by burs. of gun, day of ent.	April 8.	Below elbow.	Recovered.	May 13, 1835.
46	Eliz. P. Chapman.	31	Dec. 4.	Knee injured by fall one year before.	Dec. 12.	Above knee.	Recovered.	May 22, 1836.
47	Robert Boyd.	38	Dec. 20.	Sloughy ulcers about right ankle.	Feb., 1836.	Below knee.	Recovered.	Mar. 31, 1836.
			1836.		**1836.**			
48	Daniel Fuller.	43	Feb. 6.	Indolent ulcer of right foot from frost-bite 14 years before.	Feb. 20.	Below knee.	Died.	Mar. 16, 1836.
49	Jerry Ryan.	31	June 2.	Comp. & com. frac. of both legs, same day.	June 2.	1 above, 1 below knee.	Died.	June 2, 1836.
50	James Achworth.	28	Sept. 13.	Scrofulous disease of knee.	Dec. 10.	Above knee.	Recovered.	Jan. 30, 1837.
51	Mary Tyrrell.	24	Dec. 16.	Right knee anchylosed—abscess—bones carious.	Dec. 17.	Above knee.	Recovered.	Jan. 13, 1837.
			1837.		**1837.**			
52	W. A. Waterhouse.	43	Jan. 8.	Frost-bite of both feet eleven days before.	Jan. 21.	Both legs, below knee.	Recovered.	Mar. 12, 1837.
53	Erastus Jennison.	27	April 25.	Scrofulous disease of knee, four years.	June 10.	Above knee.	Recovered.	July 15, 1837.
54	James Kennard.	22	Sept. 8.	Swelling of knee, five years.	Nov. 14.	Above knee.	Recovered.	Dec. 18, 1837.
55	Martin St. John.	39	Sept. 24.	Leg crushed by bank of earth, day before.	Sept. 24.	Above knee.	Died.	Sept. 24, 1837.
56	Eleanor Ryan.	25	Nov. 23.	Right side of head injured by truck, when 4 years old, followed by numbness of left foot, pain, and deformity.	Nov. 25.	Below knee.	Recovered.	Jan. 6, 1838.
			1838.		**1838.**			
57	John Connor.	30	March 5.	Ankle crushed by bank of earth.	March 5.	Below knee.	Died.	Mar. 14, 1838.
58	Jarvis Gabel.	23	April 12.	Hand lacerated by a steam-engine.	April 12.	Below elbow.	Recovered.	May 17, 1838.
59	John Newcomb.	38	April 17.	Fungous ulcer on right leg from boiling water, as counter-irritant.	April 21.	Below knee.	Recovered.	July 14, 1838.
60	William Conners.	45	Aug. 22.	Both legs broken and crush. by stone wall.	Aug. 28.	Above knee (right).	Died.	Sept. 6, 1838.
61	J. W. Fullick.	27	Nov. 5.	Compound and comminuted fracture of leg and knee.	Nov. 5.	Above knee.	Recovered.	Feb. 18, 1839.
			1839.		**1839.**			
62	George Clark.	26	Jan. 16.	Compound frac. of leg—great laceration.	Jan. 17.	Below knee.	Recovered.	Mar., 1839.
63	William Burbank.	17	March 22.	Wound of hand.	March 22.	Below elbow.	Recovered.	April 22, 1839.
64	Ruth A. Blaisdel.	18	April 3.	Scrofulous disease of elbow, three years.	June 7.	Above elbow.	Recovered.	June 27, 1839.
65	Robert Fletcher.	37	May 20.	Ulcer on leg 24 years, after injury.	May 25.	Above knee.	Recovered.	July 12, 1839.
66	Jacob Hersey.	72	Aug. 6.	Fungoid ulcer on back of right hand.	Aug. 16.	Below elbow.	Recovered.	Aug. 30, 1839.
67	John Manyan.	29	Nov. 6.	Chronic carious ulcer of ankle.	Nov. 17.	Below knee.	Recovered.	Jan. 10, 1840.

Secondary hemorrhage was not frequent, though it sometimes occurred; pressure was generally sufficient to arrest it, but occasionally it was found necessary to open the stump, and tie one or more vessels. In one case, where hemorrhage occurred twelve days after the operation, from a diseased state of the posterior tibial artery, the femoral artery was tied. No one who had secondary hemorrhage died; and, though it sometimes debilitated the patient, in no case was there any permanently injurious effect from it.

In all the cases it was attempted to heal the wound by the first intention, and in a few instances it was completely successful; but in by far the greater number it was only partially so.

It has not been the usual practice, at the Massachusetts hospital, to administer an opiate before an operation, though in a few instances it has been done. In one case, where amputation was performed on a patient with delirium tremens, twelve grains of opium were given shortly before the operation; he became drowsy soon after, and recovered.

It was not thought necessary to indicate the exact part of the limb at which each operation was done, but it was supposed to be enough to say whether it was above or below the knee. It may be proper to add, that in all the cases below the knee it is to be understood that the amputation was performed above the ankle.

From this table, it appears that there were seventy operations, on sixty-seven patients; three patients having two limbs removed. In one of these three cases, one operation was above and the other below the knee; and in the

other two, both operations were below; the first patient died, and the other two did well.

Of the whole number operated on, fifteen died, and the remainder recovered, at least so far as to be able to leave the hospital; though it is probable that in some instances the disease may have returned.

There were thirty-four patients who had the thigh amputated, and one of these had the other leg taken off, at the same time, below the knee; of this number, nine died. Of twenty-three patients whose legs were amputated below the knee, two having both legs removed, five died; and of the ten who had an arm amputated, six below and four above the elbow, one died.

This goes to confirm the prevailing opinion among surgeons, that amputation of the lower extremities is more often followed by fatal consequences than that of the upper, and that death takes place more frequently after amputation of the thigh than after that of the leg. More than a quarter of those whose thighs were amputated died, while there was but little more than one death in five among those whose legs were removed below the knee, and only one of the ten whose arms were amputated. This patient, too, died of delirium tremens. The operation, to be sure, did not arrest the disease, but apparently contributed nothing to the fatal result.

This table tends also to support the opinion, that patients who undergo amputation for chronic diseases are much more likely to recover than those in whom it is performed in consequence of recent accident. Of the first class there were forty-five patients afflicted with various diseases, and of this number all recovered but five; and of the remaining twenty-two, whose limbs were removed on

account of recent injuries, no less than ten died; being nearly half of the latter, and only one in nine of the former.

This fact certainly gives support to the opinion that a state of high health is not favorable to surgical operations; and it also tends to show that death after amputation is not by any means attributable in all cases to the operation alone; for, if it were, the proportion of deaths should be as large among one class of patients as among the other. There can be no doubt, I think, that the result is influenced very much not only by the age and constitution of the patient, and the disease or injury for which the operation is performed, but also by the period at which it is done. I have before said that I thought that amputation was "often performed when it might have been avoided." But this remark applies principally to cases of recent injury. In those of chronic diseases of the limbs, the error is more apt to be of the opposite character; the operation is either not performed, or, if done at all, frequently not till it is too late. It cannot be denied, I think, that there is a disposition at the present day to defer amputation too long in cases of diseased limbs, there is an unwillingness to admit that the morbid affection is beyond the reach of remedies, and the operation is too often postponed till other parts become affected, or the system is worn down by continued irritation. At length the limb is removed; but the patient, already exhausted by disease and long suffering, is hurried to his end by the very means that might have saved him, if they had been earlier employed.

If amputation is frequently too long delayed in chronic diseases of the limbs, it is, I fear, very often resorted to

in recent injuries earlier than it should be. Many limbs that have been removed might probably have been saved; but where this cannot be done, it is rare that much inconvenience would follow from a little delay.

In most cases of accident sufficiently severe to justify amputation, the whole system has suffered a great shock; and an operation at this time, before reäction is fairly established, is very likely to cut off what little chance the patient might otherwise have of recovery. While the extremities are cold and the action of the heart is feeble, the local injury is hardly, if at all, perceived, and adds nothing to the patient's sufferings. An operation cannot be required then; and yet how often it is done at that period, — the better judgment of the surgical attendant sometimes being overruled by the importunate interference of the bystanders.

If the injury be not so serious as to cause almost immediate death, reäction usually comes on, with proper management, in a few hours; and then, if an operation be necessary, it can be done with a much greater prospect of success.

With regard to the ages of the patients operated on, it appears that there were —

			Under	20	y'rs of age,	13.	Of this No. 1	died.
Over	20	and not exceeding		30	"	31.	" 8	"
"	30	"		40	"	9.	" 3	"
"	40	"		50	"	10.	" 2	"
"	50	"		60	"	3.	" 1	"
			Over	70	"	1.	" 0	"

Whole No., 67. No. deaths, 15.

Boston, *March* 24, 1840.

Table II.

This table, it will be perceived, is prepared in a manner very similar to the preceding one. It differs from it only in noting the kind of operation, whether it were flap or circular, and also in stating every instance in which a patient inhaled any of the anæsthetic agents.

It appears from it, that from January, 1840, to January, 1850, there were seventy-six amputations of large limbs, performed on seventy-four patients, two patients having two limbs removed at the same time. One of them had one leg taken off above the knee, and the other below; and the other patient had one arm amputated above the elbow, and the other below. The first patient died, and the other recovered.

There were seventeen deaths; one of these was from tetanus, and another from phthisis. All the amputations of the lower extremity were above the ankle, and all those of the upper were above the wrist.

TABLE II. — *Amputations of Large Limbs performed at the Mass. Gen. Hospital, from Jan. 1, 1849, to Jan. 1, 1850.*

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place and kind of operation.	Result.	Time of discharge or death.	Remarks.
			1839.		**1840.**				
1	John Nowland.	23	Nov. 26.	Compound and comminuted fracture of the thigh.	July 25.	Above knee—flap.	Died.	July 25, 1840.	
			1840.		**1841.**				
2	Stillman Hubbard.	32	Dec. 24.	Caries of elbow.	Mar. 13.	Above elbow—circular.	Recov'd.	April 3, 1841.	
			1841.						
3	Bridget Duffie.	50	Aug. 14.	Compound fracture of leg.	Aug. 14.	Below knee—circular.	Recov'd.	Oct. 9, 1841.	
			1842.		**1842.**				
4	Samuel Brown.	56	Mar. 14.	Osteo-sarcoma of hand.	Mar. 19.	Below elbow—circular.	Recov'd.	April 2, 1842.	
5	John F. Homer.	34	Mar. 16.	Chronic ulcer of leg.	Mar. 19.	Above knee—circular.	Recov'd.	May 5, 1842.	
6	Jedediah Little.	73	Oct. 18.	Chronic ulcer of leg.	Nov. 5.	Below knee—flap.	Recov'd.	Dec. 26, 1842.	
7	Olwyn T. Jones.	19	Nov. 16.	Disease of knee.	Nov. 19.	Above knee—circular.	Recov'd.	Dec. 29, 1842.	
			1843.		**1843.**				
8	Henry Walker.	14	May 4.	Tubercular disease of hand.	May 10.	Below elbow—circular.	Recov'd.	July 5, 1843.	
9	Elizabeth Pickett.	17	June 10.	Disease of knee.	Oct. 14.	Above knee—flap.	Died.	Nov. 12, 1843.	
10	Edward Flagg.	45	Nov. 17.	Caries in stump.	Nov. 18.	Below knee—circular.	Recov'd.	Dec. 16, 1843.	
			1844.		**1844.**				
11	Granv. D. Bragdon.	30	Nov. 7.	Disease of knee.	Dec. 14.	Above knee—flap.	Recov'd.	Feb. 18, 1845.	
			1845.		**1845.**				
12	Thomas Smith.	53	Mar. 6.	Compound and comminuted fracture of the leg.	Mar. 6.	Above knee—circular.	Recov'd.	July 1, 1845.	
13	Daniel Tarbox.	60	Mar. 10.	Ulcer of leg—20 years.	Mar. 15.	Below knee—circular.	Recov'd.	April 22, 1845.	
14	Lewis C. Blaisdell.	31	Apr. 15.	Compound and comminuted fracture of the wrist.	Apr. 15.	Below elbow—circular.	Died.	April 19, 1845.	
15	Michael Welch.	24	May 19.	Scrofulous disease of knee.	June 17.	Above knee—circular.	Recov'd.	Aug. 25, 1845.	
16	John Field.	40	July 17.	Compound fracture of leg.	Oct. 4.	Below knee—circular.	Recov'd.	Oct. 29, 1845.	
17	Michael Devine.	21	July 25.	Comp. and com. frac. of leg.	Aug. 9.	Below knee—circular.	Recov'd.	Sept. 9, 1845.	
18	Hector Holmes.	21	Aug. 5.	Gangrene fm. inju. to thigh.	Aug. 16.	Above knee—flap.	Recov'd.	Oct. 3, 1845.	
19	Thomas Doland.	25	Aug. 7.	Comp. and com. frac. thigh.	Aug. 16.	Above knee—circular.	Recov'd.	Oct. 18, 1845.	
20	John E. Barnes.	19	Oct. 17.	Ulcer, with contracted knee.	Nov. 8.	Above knee—flap.	Recov'd.	Dec. 2, 1845.	
21	Eben C. Johnson.	12	Dec. 26.	Disease of knee.	Dec. 27.	Above knee—flap.	Died.	Dec. 28, 1845.	

A Table of the Amputations of Large Limbs. — Continued.

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place and kind of operation.	Result.	Time of discharge or death.	Remarks.
			1845.		**1846.**				
22	John Hooper.	10	Sep. 18.	Disease of knee.	May 23.	Above knee—flap.	Recov'd.	July 2, 1846.	
23	Alice Mohan.	18	Mar. 7.	Disease of knee.	Nov. 7.	Above knee—flap.	Recov'd.	Dec. 22, 1846.	Inhaled sul. eth.
24	Theophilus Petier.	35	**1846.** Nov. 16.	Compound and comminuted fracture of the leg.	Nov. 16. **1847.**	Below knee—flap.	Recov'd.	April 3, 1847.	Inhaled sul. eth.
25	Ann Kerr.	18	July 8.	Periostitis of foot.	Apr. 3.	Below knee—flap.	Recov'd.	May 13, 1847.	Inhaled sul. eth.
26	Catharine Crowley.	56	Aug. 3.	Necrosis of tibia.	Jan. 9.	Below knee—flap.	Recov'd.	April 20, 1847.	Inhaled sul. eth.
27	Fanny Abbot.	42	Dec. 23. **1847.**	Disease of ankle.	Jan. 2.	Below knee—circular.	Recov'd.	Feb. 23, 1847.	Inhaled sul. eth.
28	James Mitchell.	27	Feb. 20.	Comp. and com. frac. of leg.	Feb. 20.	Below knee—circular.	Recov'd.	July 31, 1847.	Inhaled sul. eth.
29	Dennis Pickett.	30	Apr. 6.	Compound fracture of knee.	Apr. 7.	Above knee—circular.	Died.	April 9, 1847.	Inhaled sul. eth.
30	Patrick Conny.	39	Mar. 24.	Comp. and com. frac. of leg.	Mar. 24.	Below knee—circular.	Died.	March 30, 1847.	Inhaled sul. eth.
31	Patrick Kidney.	22	May 25.	Lacerated wound of arm.	June 8.	Above elbow—circular.	Recov'd.	Sept. 2, 1847.	Inhaled sul. eth.
32	Abner Johnson.	60	May 31.	Necrosis of tibia.	June 5.	Above knee—circular.	Died.	July 4, 1847.	Inhaled sul. eth.
33	Francis Manuel.	19	June 14.	Disease of fibula.	Oct. 2.	Below knee—flap.	Recov'd.	May 20, 1848.	Inhaled sul. eth.
34	Jacob D. Edwards.	45	June 24.	Compound fracture of arm.	June 24.	Above elbow—circular.	Died.	June 24, 1847.	Inhaled sul. eth.
35	Benj. Hammond.	39	July 12.	Disease of knee.	July 14.	Above knee—flap.	Recov'd.	Aug. 9, 1847.	Inhaled sul. eth.
36	S. H. Jones.	25	Aug. 27.	Fungus hæmatodes—leg.	Sept. 4.	Above knee—flap.	Recov'd.	Oct. 28, 1847.	Inhaled sul. eth.
37	Michael Sullivan.	34	Sept. 1.	Disease of knee.	Nov. 6.	Above knee—flap.	Died.	Nov. 12, 1847.	Inhaled sul. eth.
38	Patrick Dorherty.	40	Sept. 2.	Compound fracture of foot.	Sept. 2.	Below knee—circular.	Died.	Sept. 3, 1847.	Inhaled sul. eth.
39	Nathan Butler.	60	Sept. 15.	Malignant disease of elbow.	Sept. 18.	Above elbow—circular.	Recov'd.	Dec. 13, 1847.	Inhaled sul. eth.
40	John Madden.	25	Sept. 21.	Compound fracture of leg.	Sept. 27.	Below knee—flap.	Recov'd.	Jan. 14, 1848.	Inhaled sul. eth.
41	Peter Caton.	26	Sept. 27.	Wound of foot.	Sept. 27.	Below knee—circular.	Recov'd.	Dec. 21, 1847.	Inhaled sul. eth.
42	John Nightingale.	63	Sept. 29.	Malignant disease of arm.	Oct. 2. **1848.**	Above elbow—circular.	Recov'd.	Dec. 13, 1847.	Inhaled sul. eth.
43	Michael Clark.	23	Nov. 27. **1848.**	Gangrene from ligature of the femoral artery.	Jan. 10.	Above knee—flap.	Recov'd.	Aug. 5, 1848.	Inhaled chlorofor.
44	Michael McSoley.	22	Feb. 13.	Disease of knee.	Mar. 11.	Above knee—flap.	Recov'd.	May 31, 1848.	Inhaled sul. eth.
45	Benj. T. Perkins.	33	Apr. 7.	Compound fracture of knee.	Apr. 7.	Above knee—flap.	Died.	April 12, 1848.	Inhaled sul. eth.
46	Eliz. Phenan.	6	Mar. 13.	Compound fracture of leg.	Mar. 13.	Below knee—flap.	Recov'd.	July 31, 1848.	Inhaled sul. eth.
47	James Smith.	20	Mar. 31.	Comp. and com. frac. of leg.	Mar. 31.	Above knee—flap.	Recov'd.	May 8, 1848.	Inhaled chlo. eth.

A Table of the Amputations of Large Limbs. — Continued.

No.	Name.	Age.	Time of admission.	Disease or injury.	Time of operation.	Place and kind of operation.	Result.	Time of discharge or death.	Remarks.
48	Dennis Casey.	28	Apr. 28.	Injury to arms (powder).	Apr. 28.	Abov. & bel. elb.—flap.	Recov'd.	Aug. 4, 1848.	Inhaled chlo. eth.
49	Hannah Donovan.	03	Apr. 27.	Compound fracture of foot.	Apr. 27.	Below knee—flap.	Recov'd.	Aug. 10, 1848.	Inhaled chlo. eth.
50	James M. Jones.	23	June 7.	Disease of knee.	July 15.	Above knee—circular.	Recov'd.	Aug. 19, 1848.	Inhaled sul. eth.
51	John Canfield.	10	Nov. 8.	Compound fracture of foot.	Nov. 11.	Below knee—flap.	Died.	Nov. 18, 1848.	Inhaled sul. eth.
52	Dennis Hurley.	36	Nov. 17.	Rupture of femoral artery.	Nov. 18.	Above knee—circular.	Recov'd.	April 7, 1849.	Inhaled sul. eth.
53	Timothy Lynch.	24	Dec. 7.	Gangrene of foot—accident.	Dec. 9.	Below knee—flap.	Recov'd.	Mar. 2, 1849.	Inhaled sul. eth.
54	Lucy Thresher.	26	Dec. 15.	Malignant disease of hand.	Dec. 25.	Below elbow—circular.	Recov'd.	Jan. 18, 1849.	Inhaled sul. eth.
					1849.				
55	John Rogers.	23	Aug. 23.	Scrofulous disease of foot.	Jan. 18.	Below knee—circular.	Recov'd.	Feb. 14, 1849.	Inhaled sul. eth.
56	Zimri Heywood.	10	Dec. 11.	Disease of knee.	Mar. 31.	Above knee—flap.	Recov'd.	May 9, 1849.	Inhaled chlo. eth.
			1849.						
57	Thomas Doroty.	30	Feb. 11.	Comp. and com. frac. of leg.	Mar. 17.	Above knee—flap.	Recov'd.	May 10, 1849.	Inhaled chlo. eth.
58	Bridget Shea.	28	Apr. 2.	Scrofulous disease of foot.	May 2.	Below knee—flap.	Recov'd.	July 4, 1849.	Inhaled chlo. eth.
59	Ann J. Prince.	17	Apr. 3.	Ulcer of foot—16 years.	Apr. 7.	Below knee—flap.	Recov'd.	July 4, 1849.	Inhaled chlo. eth.
60	Morris Brown.	40	Apr. 2.	Comp. and com. frac. of leg.	Apr. 2.	Above knee—circular.	Died.	April 2, 1849.	Inhaled chlo. eth.
61	Lawrence Britain.	22	Apr. 7.	Compound fracture of arm.	Apr. 7.	Above elbow—flap.	Recov'd.	May 28, 1849.	Inhaled chlo. eth.
62	Andrew Hall.	27	May 8.	Comp. and com. frac. of leg.	May 9.	Below knee—flap.	Died.	May 22, 1849.	Inhaled chlo. eth.
63	Caleb Kendall.	42	May 9.	Necrosis of femur.	May 30.	Above knee—flap.	Recov'd.	Aug. 17, 1849.	Inhaled chlo. eth.
64	James Brady.	37	May 12	Compound fracture of hand.	May 12.	Below elbow—flap.	Recov'd.	July 22, 1849.	Inhaled chlo. eth.
65	James McKoy.	39	June 19.	Compound and comminuted fracture of thigh and leg.	June 20.	Abov. & bel. kn.—flap.	Died.	June 20, 1849.	Inhaled sul. eth.
66	Charles Dennett.	34	July 20.	Compound fracture of leg.	Aug. 22.	Below knee—circular.	Died.	Sept. 3, 1849.	Inhaled sul. eth.
67	Lawrence Mazenty.	25	Aug. 24.	Compound fracture of leg.	Sept. 11.	Below knee—flap.	Recov'd.	Feb. 2, 1850.	Inhaled sul. eth.
68	Thomas Dyke.	22	Sept. 4.	Malignant disease in fibula.	Sept. 5.	Above knee—circular.	Recov'd.	Nov. 3, 1849.	Inhaled sul. eth.
69	Wm. G. Hunting.	33	Sept. 7.	Disease of knee.	Sept. 8.	Above knee—circular.	Recov'd.	Nov. 30, 1849.	Inhaled sul. eth.
70	Sylv. O. Sullivan.	35	Oct. 6.	Comp. and com. frac. of leg.	Oct. 6.	Below knee—circular.	Recov'd.	Dec. 25, 1849.	Inhaled chlo. eth.
71	Sam. R. Emmons.	48	Oct. 17.	Necrosis of femur.	Oct. 20.	Above knee—circular.	Recov'd.	July 28, 1850.	Inhaled chlo. eth.
72	Daniel Hogan.	27	Oct. 23.	Malignant disease of thigh.	Oct. 24.	Above knee—circular.	Died.	Dec. 23, 1849.	Inhaled chlo. eth.
73	Theo. S. Cushing.	32	Nov. 27.	Ulcer, in cicatrix of burn.	Dec. 15.	Above knee—flap.	Recov'd.	Feb. 7, 1850.	Inhaled sul. eth.
74	David Long.	21	Dec. 15.	Compound fracture of thigh.	Dec. 15.	Above knee—circular.	Recov'd.	Feb. 1, 1850.	Inhaled sul. eth.

There were	35	amputations	of the thigh, and	10	deaths.
"	28	"	below the knee, and	5	"
"	7	"	above the elbow, and	1	"
"	6	"	below the elbow, and	1	"
	76	amputations.		17	deaths.

Ten of the amputations of the thigh were performed in consequence of injury, and twenty-five in consequence of disease, and five of each of these two classes of patients died; that is to say, one half of the former, and one fifth of the latter.

On the five patients who died after amputation below the knee the operation was performed, in every instance, in consequence of injury; and in the two fatal cases of amputation of the arm the operation was done on patients who had severe compound fractures.

Forty of the patients had amputation performed in consequence of disease, and only five died, — being one in eight; and the remaining thirty-four had been injured, and twelve died, — being more than one third.

It is apparent, therefore, that the fatal result is not altogether attributable to the operation, but is in no small degree dependent upon the injury which the patient has received, or the peculiar state of system induced by it.

There is one circumstance, that has probably been observed by every one who has had frequent occasion to amputate for railroad accidents, and that is the great tendency of the parts in the neighborhood of the injury to slough after the operation. These accidents, when sufficiently severe to require amputation, are usually caused by a wheel of a locomotive engine or railway car passing over the limb. This, in most instances, produces a compound and comminuted fracture of the worst kind.

If the operation be performed in the immediate neighborhood of the injury, however sound the parts may appear to be at the time, they will, in most cases, slough to a greater or less extent, and leave the bone protruding beyond the soft parts, so as to require the removal of a portion of it, at a subsequent period. This is, on every account, a very unpleasant result; and we cannot feel confident that it may not happen, unless the operation be dóne at a greater distance from the injury than it is usual to do it in ordinary cases of accident. The vitality of the parts seems to be destroyed to a greater extent than is common in similar accidents that are caused by a less degree of violence. Or perhaps it would be more proper to say that their condition resembles that which is spoken of by military surgeons under the name of local asphyxia, as sometimes occurring from gunshot wounds. It is a state of suspended animation, differing from death only in the fact that the power of resisting decomposition is for a time retained; but the debilitating effect of an operation is very sure to destroy this.

It appears that in one half of the operations the circular amputation was adopted, and in the other half the flap. Nine of the former died, and eight of the latter.

Forty-eight of the patients inhaled some anæsthetic agent; twelve of this number died. It is well known that it was at this hospital that these agents were first successfully employed in general operative surgery; and so entirely satisfactory have been the results, that no operation of any importance is now performed there, without the patient being previously rendered insensible to suffering by these means. It may not be amiss to add, that no fatal effects have followed their administration, nor has

any serious ill consequence in a single instance ensued from it.

It appears, then, from these tables, that the whole number of amputations of large limbs that have ever been performed at the hospital is one hundred and forty-six, on one hundred and forty-one patients. Of this number, thirty-two died.

Eighty-five had their limbs removed in consequence of disease, of whom ten died; fifty-six in consequence of injury, of whom twenty-two died; being one in eight and a half of the former, and more than one in three of the latter.

69	patients had the thigh amputated	— 19 died.
50	had the leg removed below the knee	— 10 "
11	had amputation above the elbow	— 1 "
11	" below "	— 2 "
141		32

The ages of the patients were as follows:

Under	20 years of age,	26,	of whom	4 died.
Between	20 and 30	56,	"	11 "
"	30 and 40	28,	"	10 "
"	40 and 50	18,	"	5 "
"	50 and 60	7,	"	1 "
"	60 and 70	4,	"	1 "
	Over 70	2,	"	0 "
		141		32

Boston, *September*, 1850.

CASE OF AMPUTATION

OF A PART OF THE FOOT; WITH REMARKS.

FROM THE NEW ENGLAND MEDICAL JOURNAL, VOL. V., 1816.

THERE is no particular description, I believe, in any system of surgery, of the method to be pursued in amputating a portion of the foot. This is the more remarkable, as the bones of the tarsus and metatarsus are often so much diseased, from frost and other causes, as to require removal. To do this without amputating the whole foot, is extremely important to the patient. In the "Practical Observations in Surgery," by Mr. Hey, of Leeds, there is an account of two cases in which he performed this operation, in a manner so novel and ingenious, that surgeons in Great Britain and this country have given him the credit of inventing it, and the operation is now known by his name. The merit, however, of his invention, consists only in the manner in which he covered the stump, as the method of amputating at the articulations of the foot is described by M. Brasdor, in the fifteenth volume of the Memoirs of the French Academy of Surgery. Prior to the publication of this memoir, it was almost the inva-

riable custom of surgeons to amputate above the ankle for diseases of the tarsus and metatarsus. But, since that period, operations at the articulations of the foot have become frequent, though rarely at any other part, as surgeons seem to be apprehensive that if they are performed by sawing through the bones, the violence done to them will be so great that exfoliation will generally ensue. Richerand, Dupuytren and Roux, have each given directions by which the articulations may be found; and it appears, by the analysis of the labors of the class of Physical Sciences of the Institute of France for the year 1815, that still further rules have been laid down by M. Lisfranc St. Martin, in a memoir read to that body during the year. This desire to point out the precise situation of the articulations proves that it was considered important that operations should be performed at those places.

The following case is related merely to show that exfoliation does not necessarily take place when the bones are sawed through; and, if the same result should generally be found to follow, it is evident that in many cases of diseased foot, — such as where a small portion only of the tarsal or metatarsal bones is affected, — this operation can be used with more advantage to the patient, and more ease to the operator, than even that of Hey.

Case. — Benjamin Kellum, aged about thirty, had for five years labored under a disease of the bones of the foot, originally occasioned by frost. During that period, various attempts to cure it had been made by different surgeons without effect; and amputation had been frequently recommended, but the patient was unwilling to submit to it. A short time, however, previous to the operation, the pain was so great, and his health had become

so much impaired, that he was desirous of having the diseased parts removed. When I examined the foot, I found that on the upper surface there were two small openings, through which there was a considerable discharge of bloody pus; and, by passing a probe into either of them, it came into contact with the cuneiform bones, which were denuded and diseased at their union with the metatarsal bones. It was evident, from the state of the parts, that it was impossible to perform the operation recommended by Hey, of disarticulating the foot at the junction of the tarsal and metatarsal bones, and sawing off the projecting portion of the cuneiform bone of the great toe. The operation was therefore performed in the following manner: An incision was first made across the foot as near the diseased parts as possible. The knife was then passed between the bones and muscles on the under part of the foot, and brought out at the opposite side; it was then carried down to the first joint of the toes, so as *completely* to *separate* the integuments and muscles from the bones. The integuments at the first incision were then dissected up about half an inch, and the bones sawed through at that place. The under flap not being yet divided, the anterior part of the foot was raised up so as to be able to determine how much flap it was necessary to save. This being ascertained by bringing the muscles and integuments in contact with the stump, the diseased part of the foot was removed; the anterior tibial artery — being the only one that required a ligature — was tied, and the flap was secured in its place by two stitches. The stump was dressed in the ordinary manner. For the first ten days every appearance was favorable; healthy pus was secreted, considerable adhesions had taken place, and at the end of that time the

ligature from the artery and both the stitches had come away. A day or two after this, the patient complained of pain on the inner ankle; the part was red, and considerably swelled. Applications of lead-water were made to it; but, in about three days from its first appearance, it was found necessary to open the swelling, when it discharged a large quantity of pus. For five weeks from this time, matter continued to form on the outer and inner ankle, and four openings were made to evacuate it, one of them nearly six inches above the place where the operation was performed. The discharge became so great that the patient's health, which was feeble before the amputation, declined rapidly, and the edges of the wound showed no disposition to unite. Powder of bark and wine in large quantities was given, and the patient was put upon a generous diet. In a short time his health was improved, the discharge diminished, and the edges of the wound were considerably united, so that in nine weeks from the operation the stump was healed, excepting in three places about the size of a small pea, from which there was a pretty copious discharge, for two months longer, of pus and serum. This, however, abated, and in a short time yielded so far to friction, compresses, and the application of cold water, that, at the expiration of five months, there was only a small opening, from which a few drops of serum were discharged every day. About this time the patient began to bear more weight on that leg; and, by the assistance of a half-boot which supported his ankle, he was soon enabled to stand and walk with firmness, ease, and security. At first he was obliged to use a crutch, and he now makes use of a cane, though he can walk tolerably well without one. The last opening closed a few weeks after he began

to walk, so that the cicatrix is now firm in every part. His health is much better than it has been for five years.

Though the bones proved, upon examination after the operation, to be very much diseased, there was no exfoliation. It is probable that, if amputation had been performed some years before, the stump might have healed in a few weeks; but, as the secretion of pus had continued so long, it was difficult to overcome the morbid action of the vessels.

In the preceding article is described a case of diseased foot, with an account of the amputation of a part of it by sawing through the bones; and it was stated that the cure was probably retarded by the disease having been suffered to continue so long, and there was but little doubt that if the same operation was performed where the disease was recent the parts would speedily heal. Since that was published, an opportunity has offered of performing the operation in precisely the same way, excepting that the metatarsal bones were sawed through instead of the cuneiform. The patient was nearly sixty years of age, and addicted to an irregular and intemperate mode of life. The disease, however, which originated from frost, was recent, — of only a few weeks' standing. For the first three days succeeding the operation, the appearance of the stump was unfavorable, and the discharge consisted of an offensive, bloody ichor; there was, also, some sloughing of the integuments. A liberal use of wine and bark in substance produced a healthy discharge, and in seven weeks the stump was healed so that the patient could walk on it with great ease. At that time a very small opening was

made in it, which lasted two or three weeks, and was occasioned by the patient's striking it in walking incautiously. There were no unpleasant symptoms, and no appearance of exfoliation during the cure; and that foot is now nearly, if not quite, as useful as the other. As this operation can be performed so much more expeditiously than that of disarticulation, and in many cases where the disease will not admit of removal at the joints, and as it can be done with so much more ease to the patient, as well as to the surgeon, there seems to be no reason why it should not in most cases be substituted for it.

June 29, 1817.

REMARKS

ON THE DIVISION OF TENDONS.

READ BEFORE THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT, NOV. 23, 1840.

The division of tendons for the relief of lameness and deformity is now attracting no small degree of attention. While it is regarded by many as one of the greatest improvements of modern surgery, there are others, perhaps, who contend that all which is accomplished by it can be attained as easily, with less suffering and danger, and in as short a period of time, by suitable apparatus. I am not, however, I confess, prepared to subscribe to the latter opinion, though I would not deny that more can be effected by machinery, in many cases of deformity, than is generally supposed.

It is well known to those who have given the subject much attention, that there was hardly any improvement in the mechanical means employed in the treatment of club-foot for more than two thousand years, from the time of Hippocrates to our own. Nor am I aware that anything valuable in this way has recently been invented. We certainly know that deformities of a most painful and annoying character are now removed by a slight operation, and without a long and tedious confinement; and we know, also, that, until the practice of this operation, numberless

individuals, and some of them of the highest rank and most ample means, have carried similar deformities to their graves. Many such persons have expended large sums of money, and cheerfully endured the sufferings almost necessarily attendant on the long-continued application of complicated apparatus, in the hope of relief; but few of them have derived much benefit from these means, and most of them have remained cripples through life. No one will believe that Sir Walter Scott or Lord Byron would have submitted to their infirmity as they did if there had been in their time any known method of cure; and it can now hardly be doubted that they might have been cured by a slight operation, followed by a few weeks of confinement. They certainly had access to the best science and skill of Europe; and they surely would not have been slow to have availed themselves thereof, if these could have done anything in their case.

It will be difficult, I am sure, to persuade those who have divided tendons for various kinds of deformity to abandon the operation, unless some method equally prompt and efficacious can be found as a substitute. If there be any such at the present moment, I am ignorant of it; and I am also ignorant of any important objections that can be made to the operation of tenotomy. It is admitted that a reünited tendon becomes nearly, if not quite, as strong, pliable, and in all respects as useful, as one that has not been divided. The operation as now performed is easily done, and causes but little pain. It is safe; it has in no instance that I am aware of been productive of bad consequences; the hemorrhage is slight, and in no case of which I have heard have there been any tetanic symptoms after it. It is applicable to some kinds of deformity, as

that of strabismus, to which no apparatus can be applied; and in most others I believe that it will make the mechanical means far more efficacious, if it be done before their application. The benefit resulting from it has not, perhaps, been equal in all cases to what was anticipated; but it has, I am confident, very often done more good than any but the most sanguine would have expected.

Some persons seem to be surprised that the operation for club-foot was not done at an earlier period; but I confess that I am rather astonished that it was attempted as soon as it was, when I consider the objections that were supposed to exist to it. In the first place, it was thought till recently that most cases of this deformity were the result of a malformation of the bony structure of the foot, and that the contraction of the tendons was the consequence of this malformation. Now, if this had been the efficient cause of the difficulty, it must be apparent that the mere division of one or more tendons would not be very likely to remove it. It is singular, to be sure, that this opinion should have prevailed among intelligent surgeons, and it probably owed its origin to the fact that, when dissections were made of club-feet, they were either the club-feet of adults, or those of individuals who had for some time walked on them, and not the club-feet of newborn infants. If the latter had been examined, it would have been found that there was in most cases but a slight change in the bony structure of the part, with a trifling displacement of the bones, and that the form of the bones differed but little from that of those of the normal foot.

There is another circumstance, too, that one would have thought sufficient to prevent the adoption of this erroneous opinion, and that is that club-foot is by no means always

congenital; tnat it frequently follows disease which is attended with contraction of the tendons, and that it increases in degree from the mildest to the severest form.

Notwithstanding all this, it is certain that the opinion to which I have alluded was universally adopted, and was not called in question till the time of Scarpa. He attributed the difficulty to the right cause, muscular action; and denied that there was any considerable deformity of the individual bones, except what arose from the preternatural mode in which the patient had been compelled to walk. He demonstrated in the clearest manner, as has been stated by Duval, that in most cases of club-foot the bones are not luxated, but merely drawn from their natural relations to each other. This he did in a memoir which he published in 1803. But few, if any, adopted his views, and the opinions of surgeons remained, till very recently, unchanged upon this point. The present operation, therefore, would of course have been regarded by them as unphilosophical, and not calculated to effect the object for which it was intended.

But, admitting that a correct notion had been entertained of the nature of the deformity, there is another objection to the operation that probably exerted a considerable influence. I allude to the difficulty with which tendons were supposed to unite after having been divided. It was formerly thought that this could not be accomplished unless the divided ends were kept in close contact; and various contrivances were made to effect this in those cases in which there had been an accidental division of the tendo-Achillis. So that, if a correct view had been taken of the nature of the trouble, surgeons would have been slow to adopt the proper means of relief. It is now

ascertained, however, that tendons, like other parts, readily unite, provided the separation of the divided parts is not much greater than ordinarily takes place. This is usually accomplished in the tendo-Achillis in from three to six weeks, the difference of time depending somewhat on the age and constitution of the patient. It has been satisfactorily proved, by experiments on inferior animals, that union will take place if the separation of the divided ends of the tendon does not much exceed two inches.

There is another reason, probably, that had its effect in preventing the operation of tenotomy, and that is the fear of producing tetanus by it. This formidable malady, so often following wounds of tendons, would naturally make surgeons cautious how they divided them ; and though they must have seen numerous cases in which such division took place from accident without any bad effect ensuing, they would not be eager to do it voluntarily. They did not seem to be aware that, while a wound of a tendon is always an alarming injury, its complete division is rarely followed by bad consequences.

It will then, perhaps, be admitted, that it is not surprising that the operation of tenotomy was not attempted at an earlier period ; and that, consequently, the highest degree of credit should be awarded to the distinguished surgeon who has in our time satisfactorily shown, by his own practice, that it is both safe and useful. The few cases in which the operation was done before the time of Stromeyer, either from the manner in which it was done, or the severe suffering consequent on it, or the length of time requisite for a cure, or from some other cause not hitherto explained, had no effect in introducing it into general use.

The first case of which there is any record, of a division of the tendo-Achillis for the cure of club-foot, occurred in the latter part of the last century, at Frankfort, and the operation was performed by a surgeon of the name of Lorenz. He divided the integuments over the tendon, as well as the tendon itself, and the case is reported to have been ultimately successful. That the cure was not speedy is probable from the fact that the operation was not again attempted till the year 1811, about thirty years after, when Michaelis recommended a modification of it, consisting in a partial division of the tendon; and this he is said to have practised with much success. About the same time, Sartorius, of Nassau, published an account of an operation of this kind, but of a very severe character, in which he exposed the tendon freely before he divided it, and then violently bent the foot on the leg and ruptured whatever tended to prevent the flexion. The recovery was not only tedious, but the joint became anchylosed. I am ignorant of the details of the operation in all these cases. I have never seen the original accounts; but Delpech states that they are very imperfectly given, and that the precise mode of operating is not described in any of them. He was satisfied that in all of them the skin was very freely divided over the tendon, and to this he attributes in a great measure the want of success; the access of air to the divided ends of the tendon, he supposed, excited an undue degree of inflammation. When he operated, therefore, which he did in the year 1816, on a boy of nine years of age, he determined, if possible, to guard against this. This case he has given at length in the first volume of his clinical surgery, and describes minutely the mode in which the operation was performed.

He did not divide the integuments directly over the tendon, but introduced a bistoury between them and the tendon, and carried it completely through, so as to divide the skin on both sides to the extent of an inch, together with the cellular texture over the tendon; and he then with another knife, with a more curved edge, divided the tendon itself. But, whether from the too great exposure of the tendon or some other cause, the ends of it ulcerated; portions sloughed off, and abscesses formed in various parts of the limb. He never repeated the operation. It is said, however, that the patient ultimately recovered; but it is apparent from the account that his cure was tedious, and that his sufferings were great. In fact, Delpech says, in concluding his notice of the case, which he published seven years after the operation, "The patient now enjoys perfect health; and with the aid of a suitable apparatus, which it is my intention he should wear for many years to come, he excites, by his rapid and confident mode of walking, the astonishment and admiration of all who knew him before the operation." If the result in this case was to be considered favorable, it is not surprising that the operation was not repeated; for as much, probably, might have been gained in the same length of time by proper apparatus and manipulations, without suffering or hazard to the patient. The deformity was that of pes equinus, and I am confident that I have seen a patient, on whom I have performed Stromeyer's operation for this difficulty, in a far better condition, without having suffered at all, at the end of seven weeks, than Delpech's patient was at the end of seven years.

Such a result was not likely to bring the operation into use, and in fact it does not appear that it was again attempted

till it was performed by Stromeyer, of Hanover, in 1831. His method, however, was somewhat different, and has been crowned with the most signal success. He makes the external wound as small as possible, and does not, if it can be avoided, carry the incision through the opposite side of the integuments. The great secret of the success seems to be in making the operation in a great measure what it has been called, a subcutaneous one; the failure in the former cases having arisen, apparently, from the free incision of the integuments, and the consequent exposure of the tendon.

The tendo-Achillis, as is well known, is by no means the only one that is the subject of operation. Those of the ham, the fingers, the fore-arm, the neck and the eye, have been divided with the happiest effects. In fact, it has now become common to divide other parts, when necessary, for the removal of lameness and deformity; and for this purpose the fascia, muscles and ligaments, of many parts, have been subjected to a like operation, not only without producing any unpleasant consequences, but frequently with the best results.

It is feared by many that this operation may be carried too far, or, in other words, that it may be resorted to in cases in which it can do no good, but may do mischief. But an argument drawn from its abuse should have but little weight; a similar one might be urged against a variety of others that are daily performed by surgeons. Tenotomy is always safe and often useful in the hands of a skilful man, and it should be attempted by none other.

My own experience with the operation has not been sufficiently extensive to make it of much value. But such as it is, it is altogether in its favor. During the

year past I have operated in thirteen cases; eight of these were of that kind of deformity known by the name of varus, four that of pes equinus, and one with a contraction of the knee-joint consequent on synovial inflammation. Ten were entirely relieved in a short time; the period varying from six weeks to five months; the difference arising from the different ages of the patients and the degree of deformity; and of this number, all of them, I have no doubt, are nearly if not quite well at this moment. The remaining cases were operated on only a few days since; but from the age of the patients, they being quite young, and the slight degree of deformity, there can be no question that the feet will be brought to their proper position in a few weeks.

One of my patients was a young man in his twentieth year, who came to the Massachusetts General Hospital in consequence of a congenital varus of a very aggravated kind. "The left foot was completely inverted, so that the toes pointed to the hollow of the right foot. The sole was fairly turned upward at the toes, and gradually assumed a lateral position towards the heel. The patient walked upon a cushion of thickened integuments, formed over what should have been the superior surface of the outer tarsal and metatarsal bones." The tendo-Achillis and the tendon of the tibialis anticus were divided on the 22d of February, 1840, but no extension was made till March 3d, on account of an old ulcer on the outer ankle; the extension was removed the next day, and not renewed till the 13th, and was continued till May 8th. The position of the foot at that time was greatly improved, and the only obstacle to a cure seemed to be the rigid state of the tendo-Achillis, which was again divided and extension applied

on the 14th. By the first of July he was able to walk on the sole of his foot with a common boot, treading with great ease and firmness, and was discharged "well" on the 31st.

The operation in my practice has in no instance appeared to have been painful, and has always been performed with ease. There has not, in a single case, been an alarming symptom, and only once did the patient seem to suffer after it. This was my first case, and before I had ever seen a tendon divided. I directed the extension to be made, as advised by the French operators, soon after the operation; and the patient suffered severely for the first twenty-four hours, and passed a sleepless night. Since that time I have not extended the limb till the external wound has completely healed; in this way the suffering is avoided, nor is there apparently any loss of time, for the foot has in these cases come down quite as soon as in the one where the extension was earlier applied. In the case in which I divided the hamstring tendons, no attempt was made to extend the limb till sixteen days after the division, on account of inflammation in the sheath of the biceps; and yet the patient was able to bring the sole of the foot to the floor in six weeks after the operation.

In conclusion, I should say, from what has come under my own observation,

1. That the operation of tenotomy, when it is proper to be done at all, may be performed with safety upon patients of almost any age, though it is likely to afford greater and more speedy relief in proportion to the youth of the patient.

2. That it is an operation that can easily be performed by any well-educated surgeon.

3. That it is important in doing it to make the external incision as small as possible, as in this way inflammation is less likely to occur.

4. That extension should not be applied till the external wound has entirely healed.

And, lastly, That the patient, if the deformity has been in any degree considerable, should be required to wear for a year, at least, a boot with suitable springs, that will keep the foot in the proper position, and at the same time counteract the tendency of the muscles to contract.

CASE OF LIGATURE

OF THE CAROTID ARTERY, FOLLOWED BY SECONDARY HEMORRHAGE, AND RECOVERY.

An Irish laborer, thirty years of age, was brought to the Massachusetts General Hospital on Monday, January 27th, 1847, in consequence of injuries received the afternoon before, while blasting rocks in a neighboring town.

The right thumb had been removed by a surgeon who saw him soon after the accident, and the left was amputated near its middle. All the fingers were lacerated to a greater or less extent, and there was a severe compound fracture of the ring-finger of the left hand.

The most important injury, however, was about the head and face. The left eye was destroyed, and the right was so filled with gunpowder and other foreign substances, that it was not easy at first to determine what was its precise condition. There was also on the left side a severe contused and lacerated wound, extending from the ear to within an inch of the symphysis of the jaw. The mastoid muscle was torn off just below its origin. The facial artery was divided, but did not bleed, and there was no hemorrhage of consequence from any vessel. The jaw was broken in several places, the fractures extending from

the angle almost to the symphysis. There were no less than five fractures; the coronoid process was broken off, and the bone denuded in several places. One of the fractures was in a longitudinal direction of great extent, communicating with the dental canal. The fragments of bone, though loose, could not be removed without cutting away some of the soft parts, and they were therefore left.

For the first few days he was comfortable, suffering but little, except from the socket of the left eye, in which a copious suppuration was going on. On the 1st of February he was attacked with delirium tremens, which continued for a week, and then passed off, leaving him as well as before it came on. During this time the wound was so offensive as to render it necessary to keep the patient in a room by himself; and he was carefully watched, as there was reason to think, from the depth and situation of the wound, as well as its character, that hemorrhage would occur when the sloughs separated.

On the 10th of February the wound was perfectly clean, with a healthy granulating surface, six inches long, four wide, and two deep. The fetor being entirely gone, the patient was removed back to the ward, and directions given to the attendants to make compression if bleeding should occur. This took place on the morning of the 12th, but was controlled at once by pressure, so that a small quantity only of blood was lost. At my visit at eleven o'clock, there was no bleeding; but it recurred at one o'clock P. M., when I was sent for. On my arrival, in an hour after, I found two of my colleagues, Drs. Townsend and S. Parkman, already with the patient. The hemorrhage had been immediately checked by pressure

made with a small piece of sponge on the spot from which the blood issued. I proceeded at once to tie the carotid artery. The vessel was not come at so readily as it would have been under ordinary circumstances. The mastoid muscle, being cut off near its origin, had contracted into a round, firm body; and the cellular membrane in the neighborhood was infiltrated with bloody serum, so that the relative position and the appearance of the parts were somewhat altered.

The artery, however, was secured without much difficulty, and firmly tied with a strong ligature. The wound was dressed in the usual simple manner. All pressure was taken off from the part where the blood had issued, and there was no pulsation in any vessel given off by the common carotid of that side. The patient was but little disturbed by the operation, and said that he felt more comfortable than he had felt at any time since the accident; owing, probably, in part, to the fact that he was relieved of the apprehension of hemorrhage.

His pulse, immediately after the operation, was one hundred and twelve; it fell the next day to eighty-four, though he complained of headache. Everything seemed going on well till the morning of the 15th, when he said that he had suffered very much in the night from pain in the head; the skin was hot, and the pulse one hundred and twelve, though it became less frequent in the course of the day. Towards evening hemorrhage took place from the spot where the original bleeding occurred; a small quantity only was lost, and it was controlled by pressure. He bled again on the 20th, and also on the 23d. At each time the amount lost was trifling, as an attendant was at hand who made effectual pressure at once on the part. I

was not sent for, and did not see him at either of these times. I felt confident, however, that he would bleed again, and therefore gave directions to be called whenever it should occur.

On Friday, the 26th of February, the ligature came off from the artery; the wound from the operation was nearly healed, and there was no pulsation in any vessel on that side of the head. In the evening of the same day the bleeding recurred; pressure was made at once with a piece of sponge, and when I arrived I found an assistant still pressing firmly on the part.

There was no doubt that the blood was arterial; and it was equally certain, from the statements of those who were with the patient, that it came from a large vessel. It flowed principally from the same spot at which it issued at the first bleeding, and its direction showed conclusively that it was furnished by vessels within the cranium. The proper course, I thought, was to remove that part of the jaw that prevented a ready access to the bleeding vessel, then secure it by ligature if possible, and if this could not be done, apply the actual cautery. Having made the necessary arrangements to accomplish this, the pressure and sponge were removed; but, to my surprise, no bleeding followed. I then proceeded to remove the coronoid process, that had been broken off from the body of the bone at the time of the accident, but was still held in its place by the soft parts, and all that portion of the jaw that covered the bleeding vessel. The finger could then be passed upwards and backwards something more than an inch towards the base of the skull. At this point a strong pulsation was felt, and also a piece of bone that had evidently been detached from the jaw at the time of the injury, and

driven into its present position. On removing this spiculum of bone, which was an inch long and two lines wide, a jet of blood, equal to that from a divided radial artery, gushed out. I arrested it by applying my finger to the bleeding vessel. I was now satisfied that it could not be taken up at this place. It would be impossible to carry any instrument by which the artery could be got hold of to such a depth through so narrow an opening; and even if this could be done, I did not see how a ligature could be passed around it. The actual cautery, therefore, appeared to be the only thing to be resorted to at that time; and if the bleeding should recur, the jaw might be disarticulated, and attempts could then be made to tie the vessel with a greater prospect of success. An iron, with a ball of half an inch diameter at its end, was heated to a red heat, and I applied it directly to the bleeding artery. The hemorrhage ceased at once. The pulsation, however, could still be felt by pressing on the eschar; and when this was slightly moved by a probe, a little bleeding followed. I therefore applied the heated iron a second time, and the bleeding and pulsation were immediately arrested. A cloth dipped in cold water was applied to the wound, and a piece of oiled silk laid over this. He suffered less from the actual cautery than I had anticipated; he slept a considerable part of the night, and was quite comfortable the next day. He never bled again; his convalescence was rapid; the wound healed well; no slough came off from the part on which the iron was applied; he regained almost entirely the motion of his jaw, and was discharged, well, on the 22d of April.

There are two or three points in this case that are perhaps worth alluding to.

The first bleeding did not occur till two days after the sloughs had been thrown off from the wound, as far as it could be seen; showing that the artery did not slough at so early a period as the other soft parts. This is a fact of some practical importance, as it teaches that the danger of hemorrhage is not over, in cases of contused wounds, when the principal part of the sloughs separates, and that the patient should be carefully watched for some days after.

The recurrence of the bleeding after the ligature of the carotid was probably owing to the spiculum of bone that had been driven into the vessel, and thus prevented it from closing, as it would have been likely to have done under ordinary circumstances.

The actual cautery was entirely successful. The pain produced by its application was not excessive nor long-continued; and even admitting that it had been so, this now ceases to be an objection to its use, as we have it in our power to render patients insensible by the inhalation of the ether. It was speedily done, and no parts were mutilated or injured by it in the slightest degree. It is somewhat doubtful whether a ligature could have been applied under any circumstances to this vessel, so as to stop the bleeding; it certainly could not have been done without removing a large part of the lower jaw of that side; subjecting the patient to a severe and tedious operation, which, under the most favorable circumstances, would have left him in a much worse condition than he now is.

Boston, *July* 1, 1847.

REMARKS

ON WOUNDS RECEIVED IN DISSECTION.

READ BEFORE THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT, JULY 24, 1843.

Injuries received in dissection, it is well known, are often followed by severe and sometimes by fatal consequences. The subject is an important one on every account, especially as professional men are not agreed as to the cause of the trouble, or the best mode of treating it. It should be recollected, too, that all who practise the profession of the healing art are exposed to these injuries, as no certain mode has yet been found of guarding against them. In the hope of drawing your attention to the subject, rather than in the belief that I can throw any new light upon it, I shall offer a few remarks as the result of my own observation, and, I may add, personal experience.

The effects arising from such injuries have been attributed by some exclusively to the irritable state of the patient's system; in other words, they have regarded these cases as cases of morbid irritation; while others have supposed that they were entirely the consequence of the absorption of some deleterious matter. Neither of these opinions, I think, can be adopted to the full extent. It seems to me that some of these cases, and perhaps a large

proportion of them, are to be attributed to irritation alone; others, again, are the result of the absorption of some noxious fluid; while there is a third class, that arise from the combined influence of both these causes.

That irritation is capable of producing effects as alarming as any that are witnessed from injuries caused by dissection is well known to those whose attention has been called to this subject. Tetanus is, perhaps, as good an example as can be adduced. Here is a disease, almost uniformly fatal, arising, for the most part, from a trivial wound, inflicted oftentimes by a clean instrument, and where there can be no pretence for supposing that anything poisonous has been introduced into the system. The alarming effects which arise in such cases must be attributed in great measure to the morbid irritability of the patient. This state may be congenital, but it is most often acquired, and is induced usually by excess in the mode of living, and especially by the immoderate use of alcoholic drinks. Hence tetanus is rarely met with in females or children, but its subjects, as far as my observation extends, have been, in a great majority of cases, persons of intemperate habits of life.

There are various other instances of severe effects following slight injuries that might be adduced. Some of the most formidable cases of paronychia that have ever come under my notice have arisen from slight wounds of the hand, caused by needles or pins. Deep-seated suppuration under the fascia, or in the theca of the flexor tendons, going the whole extent of the fore-arm, and terminating occasionally in sloughing, which impairs for life the usefulness of the limb, is not an unfrequent consequence of trifling accidents of this nature. No one, I

think, will pretend to attribute these ill consequences to anything but the state of the patient's system. It is not possible that any poison has been introduced into it, and similar and more severe wounds are received daily by numberless individuals without suffering or inconvenience.

Besides these general considerations, there are some circumstances that may be named that render it probable that many of the cases of injury arising from dissection are wholly independent of absorption, and are rather attributable to the state of the patient's system at the time of the injury. Among these may be mentioned the fact that students engaged in dissection are rarely troubled in this way in the beginning of the season, though they are much more likely then to wound themselves, from awkwardness and inexperience, than at a later period. But when the health becomes impaired from fatigue, exposure to bad air, want of proper exercise, or any other cause, a very slight wound is often followed by alarming symptoms.

It should also be noticed that severe cases sometimes occur when there is nothing in the nature of the disease, or the part of the body that is examined, or the character of the wound itself, that is in any way likely to produce trouble. One of the members of this society, several years ago, suffered excessively from a slight scratch made by the cranium of a child that had died of hydrocephalus. Extensive and deep-seated suppuration under the fascia of the hand followed the accident, and the constitutional symptoms for a time were of an alarming character. There was certainly nothing in the history of this case to justify the opinion that any morbid matter had been absorbed. I have known two or three other cases as striking as this, and in all of them the patients' systems were in

that feeble and irritable state that seems well calculated to invite disease.

It may be observed, too, that the readiness with which the symptoms sometimes yield to appropriate remedies renders it probable that in such cases, at least, irritation rather than absorption is the cause of the trouble. A blister encircling the fore-arm often affords considerable relief, even though it is not applied till the veins and absorbents are red and inflamed along the whole extent of the limb to the axilla. Now, this effect would not be likely to be produced by such a remedy if any noxious matter had been conveyed into the circulation.

Though I have attempted to show that some of the cases of the injury of which I have been speaking are probably the result of the irritable state of the patient's system, I do not pretend but that others may be attributed to the absorption of some noxious matter. Of this I think there can be no doubt. There are two facts that render it almost certain: one of these is, that persons in most perfect health are occasionally affected in this way; and the other is the well-known one that these accidents are most often met with in examining the bodies of those that have died of some particular disease, as peritonitis, and especially puerperal peritonitis. It cannot, I think, be doubted that this affection is more severe and alarming, and more likely to terminate in death, when it is the result of these two causes; that is, when absorption takes place at the time the patient is in an irritable state, or, in other words, when his system is predisposed to disease.

During the last year, more persons than usual were affected in this way in our vicinity, and there were three or four fatal cases. To what this may be attributed it is

not easy to say. Erysipelas prevailed to a greater extent and in a more severe form than usual; and there was probably a greater number of fatal cases of puerperal peritonitis than in ordinary years. These two circumstances may perhaps aid us in attempting to account for the increased number of these accidents. The system was predisposed to erysipelatous inflammation, and it came on from slight causes; and there was also, no doubt, a greater number of post-mortem examinations of the bodies of those who died of peritonitis than usually occurs in the same length of time.

There is great diversity, as far as I have seen, in the symptoms of this affection. Sometimes, and not unfrequently, they are wholly local, confined to the arm, hand, or even the finger, that was injured. At other times, the whole system is affected, either with or without much local trouble. It is obvious, therefore, that the same mode of treatment is not adapted to all cases; and this may in some measure account for the fact which I noticed in the beginning of this paper, and that is that physicians were not perfectly agreed as to the curative methods.

It is not my intention now, if I had the materials, to write a full article on this subject. To do this as it should be done, would require the individual who attempts it to have seen a far greater number of cases than have fallen under my observation. But, as I suffered severely from this cause during the last year, I shall, at the hazard of being charged with egotism, give you a short account of my own case.

I lost a patient, a child of six or seven years of age, with symptoms of peritonitis, on the 2d of February, 1843. On the following day, at twelve o'clock, the body

was examined by Mr. Thayer, the house physician of the Massachusetts hospital, in presence of my friend Dr. J. B. S. Jackson and myself. While the examination was going on, I pricked the end of the forefinger of my right hand with several needles that were sticking in a ball of thread. The punctures were very slight, giving no pain or uneasiness, and hardly attracting any notice at the time. I have no recollection of having touched the body of the child at all; yet there is very little doubt that I did apply the end of that finger to the mucous coat of the intestine, on a part, too, which was supposed to be slightly ulcerated. I felt no inconvenience during the day or evening, and went to bed at twelve o'clock as well as I had been for some weeks. For a month previous I had not enjoyed my usual health; I was easily fatigued, and had but little appetite, and frequently went without my dinner. This is not an unusual thing with me, and I attributed it to having a little more to do than I could accomplish with ease. For three months, in addition to my private business, I had been lecturing and attending the surgical department of the hospital. I mention this to show that my system was in a condition to be easily affected.

I awoke at two o'clock in the morning, with intense pain in the end of my finger. It was of a peculiar kind; there was a feeling of crowding and distension of a most distressing character, and such as I never experienced before. It was confined to the last joint of the finger. As I could not sleep, I arose at six o'clock, took no breakfast but a cup of coffee, and the only way in which I could get any relief was to keep my finger immersed in a tumbler of cold water while I was at table. On examining the finger, I found it swollen, and the last joint, to which the pain

was still confined, was almost of a purple color. It was hot, and throbbed violently.

On my way to the hospital I visited one patient, and, after seeing all the surgical patients there, as the pain in the finger had increased very much, I had several leeches applied. Though a very considerable amount of blood was drawn, I obtained no relief; the finger was even more painful than before, and I then felt for the first time the constitutional symptoms, — rigors, pain in the head and back, and nausea. I, however, left the hospital, and continued to visit patients till half-past twelve o'clock, feeling, I have no doubt, and looking, as I have since been told by several of them, much sicker than any for whom I prescribed that day. I then went home, undressed and went to bed, which I was unable to leave for a moment for four days. I can truly say that, though I have often been sick, I never felt so sick before in my life. I had all the symptoms of sea-sickness, with a great degree of pain superadded. The arm at this time was painful and swollen to the axilla; the veins and absorbents were also red and inflamed; and what seemed to me to be singular was that those on the back of the arm were more affected than those on the front. One of the most distressing symptoms at this time was the nausea; I could not raise my head from the pillow without fainting. I had an extreme disgust for every kind of food, though the thirst was intense.

I had the arm bathed frequently with laudanum, and cloths wet with the same applied, so as to keep the parts constantly wet. I also had a blister put on just below the elbow, and in the course of the afternoon I took fifteen or twenty grains of the compound rhubarb pill. At about

six o'clock, I got a little sleep, which lasted, perhaps, for half an hour, when I awoke, still in great pain. The thirst was unabated, and a little iced water was the only thing that was in any degree tolerable. In the course of that night I took two ounces of paregoric and eight grains of opium, without procuring more than an hour's sleep, and this was not continuous. The suffering, however, was very much lessened, for a time, by the opiates. On the following day I was visited by Dr. Warren. As the cathartic taken the day before had not operated, he directed the compound infusion of senna with Epsom salts, which produced ten or twelve dejections. He also advised the continuance of laudanum to the arm, and to take McMunn's elixir of opium at night. The pulse at this time was about one hundred, neither full nor strong; the arm less painful than on the preceding day, but the hand quite as much so. The whole finger, with the nail, was now of a dark purple, the cuticle was raised up from the cutis, and a bloody serum, almost black, was effused under it. The thirst was unabated, and the only thing which I took for three days, beside the opiate, was the Seltzer water; and this I drank in small quantities, every fifteen or twenty minutes, day and night.

I took the elixir of opium as directed, one hundred and forty drops at a dose, to be repeated in two hours if sleep was not procured; I took three doses in this way with some relief, but slept but little during the night. On the following day I was restless and uneasy, with headache, nausea, dry skin, furred tongue, and parched mouth. Dr. Warren ordered an emetic of the powder of ipecac., and after its operation leeches to the arm. I vomited very freely several times, and the leeches drew well; at night I felt some-

what relieved, but the pain in the hand and the back was too severe to allow me to sleep without an opiate. I took, that night and the two following nights, an ounce and a half of the syrup of poppies, with a grain and a half of the sulphate of morphia, each night, divided into five doses, taken at intervals of two hours. This produced almost complete relief, but no quiet or continuous sleep. The comfort that I got from it cannot be described or imagined by any one who has not taken it under similar circumstances. I had none of the itching of the skin, the distressing headache and uncomfortable restlessness afterwards, that so often follow as the effects of large doses of opium. The only inconvenience that I experienced arose from the profuse sweating, which seemed to be the effect of the opiate, as it ceased when this was left off.

On the fourth day I felt much better; I had but little suffering except from the hand and arm, and these gave me far less pain than in any preceding day since I had been sick. The finger was nearly black, almost four times as large as the other. The cuticle had risen up in a large vesicle, and the nail, also, had become detached, held only by cellular membrane. Free incisions were made through the cuticle, and a considerable quantity of dark bloody serum was discharged. These incisions gave me no pain whatever; the part cut was entirely insensible. There was no pus, nor was there anything about the finger that looked like healthy inflammation. The true skin, when the cuticle separated from it, was found to be of a dark livid color, almost black, and gangrenous to a small extent in two places. I felt so much better at this time that I began to think my suffering was nearly over, though I feared I might lose the whole or a part of the finger. I

should have observed, also, that when the cuticle was removed four or five punctures could be seen on the end of the finger, which were, no doubt, those made by the needles.

It was not my good fortune, however, to escape without additional pain. On the morning of the fifth day I was seized with a violent pain, coming on somewhat suddenly, in the palm of the hand, just at the point where the forefinger is united to the metacarpus. The part began immediately to swell, and became exquisitely tender. Leeches were applied to it, and the whole of the back of the forearm and hand was covered with a blister. These means afforded me considerable relief, and three days from the attack a small abscess was opened on the back of the hand, from which were discharged one or two drachms of tolerably healthy pus. From this time I steadily improved. The sloughs were thrown off from the finger, and the nail separated; the swelling and tenderness of the hand and arm gradually subsided, though the stiffness and loss of power continued for some time longer. The entire motion of all the fingers I have not yet recovered, and the sensibility of the end of the forefinger is far from being perfect. I feel, however, that I am still gaining in this particular; and my hand now, for all practical purposes, is nearly as useful as before the accident.

My recovery was rapid, so that I was able to attend to business in a month from the time I was taken. For a fortnight of my confinement, I lived entirely on liquids; and for nearly a month I took no heating or stimulating food, my diet consisting of bread-and-milk, thin broth, and beef-tea. I am satisfied that more stimulants would have been injurious, at the same time I am convinced, from what I have seen in similar cases, that more active deple-

tion by general blood-letting, and powerful cathartics, would have produced extreme if not remediless prostration.

One of the most constant symptoms, in affections of this kind, is the watchfulness, showing very clearly to my mind a high degree of cerebral disturbance. Opiates are almost always required, and uniformly borne well; at the same time, they do not commonly produce sleep, even when administered in large doses. They allay, however, the irritability of the system, and serve to soothe and tranquillize the patient. A medical student, who was affected the winter before last from a wound made in dissection, took every night for several weeks four hundred drops of laudanum, and this large quantity only procured him a moderate amount of sleep. The truth seems to be that these cases have a very close analogy, if they are not identical, with those of morbid irritation, and are best managed by the same course of treatment. The topical remedies must vary in different cases, but in every instance where there is a local affection of any consequence I regard a blister applied to the arm as of the utmost importance. I can truly say that I had no severe pain in any part of my limb above where the blister was applied after it had drawn, though it had pained me severely before up to the axilla. I have heard several other patients make the same remark. Leeches and bathing with laudanum, where there is much pain or inflammation, often afford great relief; more, I think, by far, than can be obtained by poultices and fomentations, though these are often useful at a late period.

Among the general remedies, emetics and cathartics hold an important place, where there is much constitutional disturbance. These should be administered in the

beginning, but it is not necessary that they should be of a very powerful kind; in fact, the patients that I have seen with this affection do not bear very active medicines well. These are to be followed with laxatives, mild diuretics, liquid diet and opiates, according to circumstances. I believe that patients are more likely to do well under this course than under one of a more severe and active character. It is important, however, to begin early; the fatal result, in most of the cases of which I have had any knowledge, may be attributed, in my opinion, to the patients having too long delayed the use of remedies. All the cases that have come under my care I have seen at an early period, and I have never yet seen one that has not terminated favorably.

I have thus thrown together very hastily the principal circumstances of my own case; and I leave it to others to decide whether the symptoms were to be attributed to irritation or absorption, or to the combined influence of the two.

CASES

OF VESICO-VAGINAL FISTULA TREATED BY OPERATION.

The following cases are all in which I have performed an operation for vesico-vaginal fistula. It was done in every instance by ligature. The result has, on the whole, been satisfactory. Anything that is calculated to remove this infirmity, or to lessen in the slightest degree the sufferings of the individuals who are afflicted with it, should be made known.

On this account, I propose to state at some length my experience on the subject, and, at the risk of being tedious, to give in detail the particulars of each case, and the method I pursued with a view of removing the difficulty.

I had never seen the operation done till I did it myself, nor could I find any description of the mode which others adopted that was sufficiently clear and explicit to be of much service. I had, therefore, to take such a course as I thought safe, and at the same time likely to effect the object, namely, the closure of the fissure. I do not know that others may not have operated precisely in the same way; but, if they have, I am not aware of it.

I have reason to be satisfied with the result; the success of my operations has, I believe, been much greater than

the average. Whether this is to be attributed to the mode of operating, or the favorable nature of the cases, I shall not undertake to decide.

I have performed the operation twenty times, but it was done on nine patients only, — one being operated on six times, another five, two twice, and five once. In three cases the operation was entirely successful; in five the patient obtained great relief, so that the urine could be retained for a number of hours without any escape through the fistulous opening; and in the remaining two no benefit was derived from it.

The first operation was performed on the 10th of May, 1839, and an account of it was published in August of the same year at Philadelphia, in the *American Journal of Medical Sciences.* This is here reprinted; and those that I have since treated, which are given in the order in which they occurred, are now published for the first time.

Case I. — *Case of Vesico-vaginal Fistula successfully treated by an Operation.** — A preternatural opening between the bladder and vagina, known by the name of vesico-vaginal fistula, is one of the most distressing accidents to which females are liable. Its most common cause is protracted labor, in which the head of the child has been allowed to press for a great length of time on the bladder, when that organ is distended with urine. Gangrenous inflammation is in this way produced; a slough forms, which separates in a few days after delivery, and through the opening thus made the urine is destined to pass, in most of these cases, during the residue of the patient's miserable existence.

* From the *American Journal of Medical Sciences.*

Though this is, without doubt, by far the most common cause of vesico-vaginal fistula, it may occasionally be produced in other ways. It may be the result of a careless use of instruments in the delivery of the child, as when the bladder has been torn by a crotchet; or it may arise from an abscess, a stone in the bladder, or a disease of that organ.

Whatever may be the cause of the fistula, the consequence is, in the majority of cases, of the most afflictive kind, not only because all the urine passes through this new opening, but because the patient has no power of retaining it; she is rendered miserable by the excoriation and soreness that are thus produced, and loathsome to herself by the fetor of the urine. So wretched is the condition of patients of this class, that the language which Dieffenbach applies to them can hardly be thought to be exaggerated. "Such unhappy beings," he says, "are forced to exclude themselves from society; the very atmosphere surrounding them is polluted by their presence, and even their children shun them. Thus rendered miserable, both morally and physically, they yield themselves a prey to apathy; or a pious resignation alone saves them from self-destruction."

The degree of suffering, however, is not the same in all cases; the difference arises from the part of the bladder in which the fistulous opening is situated. When it is high up, the patient has some power of retention; but even then the urine escapes through the opening when any considerable quantity accumulates in the bladder. But if the fistula is lower down, at the place where it is usually found, about an inch to an inch and a half from the opening of the urethra, the retentive power is almost,

if not altogether lost, the urine flowing off as fast as it is deposited by the ureters.

So great have been the inconvenience and suffering to which patients of this class have been subjected, that the attention of surgeons has long been directed to this formidable trouble; but it is not till within the last twenty years that any operation for its radical cure has been successfully performed. It is only ten years since, that Mr. Henry Earl remarked, "It must be confessed that, under the most favorable circumstances, these cases present the greatest obstacles, and are certainly the most difficult that occur in surgery." He succeeded, however, in perfectly restoring three such cases; "in one of which," he says, "I performed upwards of thirty operations before success crowned my efforts."

The obstacles to success are numerous, and must be apparent. The narrow space in which the operation is to be performed, the disposition of the urine to pass between the lips of the wound, the proximity of the ureters, the great secretion of mucus by the inner coat of the bladder, which is well calculated to interfere with the union of the parts, and the want of readiness with which mucous surfaces take on adhesive inflammation, are all very likely to defeat almost any operation, however well it may be done.

Several modes have been devised of operating for the radical cure of the vesico-vaginal fistula. Dupuytren recommended, where the opening was small, the application of the actual cautery. In his hands it is said to have occasionally succeeded; but with other surgeons it has almost uniformly failed. The objections to it are numerous, and, to my mind, decisive. It is not easily applied; it is difficult, and sometimes impossible, to limit its action;

and, if this be not done, the orifice is enlarged, instead of being closed, and the trouble of course aggravated.

When there is a laceration only of the bladder, without loss of substance, union, it is said, has sometimes been effected by keeping a catheter in the bladder, and thus preventing the flow of urine through the wound. But cases of this kind are rarely so favorable, as they usually arise from a sloughing of the organ, followed by a loss of a portion of its parietes. In these cases it has been preferred to use the ligature, the edges of the opening being previously pared. In a few instances this operation has succeeded; in many it has failed, and in some cases it has been productive of inflammation, which terminated in death. For these reasons, as well as because I am not aware that the operation has ever before been successfully done in this country, I shall give the history of the case and the mode of operating at some length.

Case. — A married lady, aged thirty-four, and of good health, consulted me on account of a vesico-vaginal fistula. Fifteen years ago, she was delivered, by means of instruments, of her first child, which was dead, after having been in labor three days, during all of which time she passed no water. About ten days after her delivery an opening formed between the bladder and vagina, and since that period she has lost the retentive power of the bladder, and all the urine has escaped through the opening, except when a catheter has been introduced. Occasionally, when in a horizontal posture, there would be no escape of urine for two or three hours, though usually there was a continuous flow; but when in an erect position it was constantly dribbling, causing great inconvenience and distress. She had been eleven times pregnant

since the accident, but had never gone her full period since the birth of her first child. It is not improbable that the fistula might have had some influence in the production of these repeated abortions.

The only attempts that had been made to relieve her consisted in the introduction of a catheter, which she wore for a considerable length of time, and touching the edges of the opening with caustic. Neither of these means afforded any relief; of late nothing had been done, and she regarded her case as almost hopeless.

Upon examination, I found the fistula situated from an inch and a quarter to an inch and a third behind the urethra, a little on the left side. It was not large, barely sufficient to admit the end of my forefinger, and surrounded by a hardened edge, nearly of the consistence of cartilage. There was some degree of morbid sensibility in the lining membrane of the vagina, so that an examination was quite painful.

I told her that an operation for the difficulty had been several times successful; that it had more frequently failed, and that in a few instances it had been followed by very serious consequences. At the same time, I regarded her case, on the whole, as a favorable one; and if, after this explanation, she wished for an operation, I would cheerfully undertake it. She at once consented, and it was fixed for the next day but one, May 10th, 1839; when it was performed in the following manner, in the presence of my friends Drs. Channing, C. G. Putnam and J. B. S. Jackson.

The patient was placed on the edge of a table, in the same position as in the operation for lithotomy. The parts being well dilated, I introduced a large bougie into

the urethra, and carried it back as far as the fistula. In this way I was able to bring the bladder downwards and forwards, so that the opening was brought fairly into view. The bougie being then taken by an assistant, I made a rapid incision with a scalpel around the fistula, about a line from its edges, and then removed the whole circumference of the orifice. As soon as the bleeding, which was slight, had ceased, I dissected up the membrane of the vagina from the bladder all around the opening, to the extent of about three lines. This was done partly with the view of increasing the chance of union, by presenting a larger surface, and partly to prevent the necessity of carrying the needles through the bladder. I then introduced a needle, about a third of an inch from the edge of the wound, through the membrane of the vagina and the cellular membrane beneath, and brought it out at the opposite side, at about an equal distance. Before the needle was drawn through, a second and a third were introduced in the same way; and these being found sufficient to close the orifice, they were carried through, and the threads tightly tied. Each thread was left about three inches in length. I should have remarked that I found no difficulty in introducing the needles by the hand, the fistulous opening having been brought so low down and so fairly in view.

A short silver catheter, constructed for the purpose, was then introduced into the bladder, and the patient was conveyed to the bed and laid on her right side, to prevent any urine from coming in contact with the wound. I found her in the evening, eight hours after the operation, quite comfortable. She had had some smarting for two or three hours, but this was soon gone; she complained a little of the

catheter; all the water flowed through it, and was received upon cloths. She was directed to live on thin arrow-root, milk-and-water, and a solution of gum-Arabic.

In the morning I removed the catheter, lest it might become obstructed, and after cleansing replaced it. No water had escaped through the wound. The patient had slept some in the night; her pain had been slight, and all her sufferings she referred to the instrument. Her pulse was good, and she had no febrile symptoms. She was directed to keep in the same position, to live on the same diet, and take a solution of salts early the next morning.

She went on perfectly well for five days, the catheter being removed daily. At this time I examined her by means of a speculum. I found that the stitches were quite firm, and that the wound had apparently healed in its whole extent. There was no oozing of water through it, though she was then lying on her back, and there was urine in the bladder, as it flowed through the catheter as soon as I introduced it. I then cut away the stitches, which I found by no means easy, as I was afraid to bring down the bladder as was done in the operation, lest the wound might be torn open. The stitches, however, were at length safely removed, and in doing this I was much indebted to the assistance of my friend Dr. Putnam.

A smaller catheter was now introduced, and the patient put to bed in the same position as before. She continued very comfortable for two days, much more so than she had been at any time before, which she attributed to the size of the instrument. I then removed the catheter altogether, and directed her to introduce it every three hours, so as to prevent any accumulation of urine. This she did

till the second night, when she slept quietly for seven hours, and on waking felt no inconvenience. Twice, also, during this period, she passed water by the efforts of the bladder alone; so that the organ had already regained in part its expulsive power, as well as that of retention. She now sat up, introduced the instrument less frequently, and was allowed a more generous diet.

At the end of seventeen days from the operation, I examined her again; the wound was entirely healed and apparently firm, and the soreness nearly gone. I advised her to introduce the catheter two or three times a day for some weeks; and on the following day she returned home by water, a distance of nearly two hundred miles.

Everything connected with this case proved more favorable than I had anticipated. The operation was not difficult, nor very painful; it was followed by no bad consequences, and afforded complete relief. Perhaps the mode in which it was done may have contributed something to the successful result. No violence was done to the parts by drawing down with hooks the fistulous opening, as in the common mode; nor was the bladder wounded by carrying the needles through it, which I presume is the usual practice. I do not speak with certainty on this point, for I cannot find that any one has given a precise description of the mode in which the operation is to be performed. It may be inferred, from the following remark of Dieffenbach, that he carried the needles through the bladder. "It is enough to say," he remarks, "that the operation is always a dangerous one, chiefly on account of the injury done to the bladder; the suture always producing more or less inflammation of the edges of the fistulous opening, or of the surrounding parts." Now, it seems

to me that in almost every case in which the ligature would be the proper mode of operating, the edges of the bladder can be brought in contact without wounding that organ. The chance of adhesion would be much greater, and the danger of inflammation incomparably less. By dissecting up the membrane of the vagina to a considerable extent around the orifice, and carrying the needles through this at some distance from the edge of the wound, I cannot doubt that the edges of the bladder, which, of course, should be previously pared, may in almost every case be brought into close contact.

This, of course, cannot be done where there is great loss of substance, but in such cases the ligature would not alone be sufficient, and some attempts have recently been made to treat them by the plastic method. "This operation consisted," says Blandin, "in paring the edges of the fistulous orifice, and adapting over it an oval flap derived from the internal surface of the large labia." This operation, according to the *British and Foreign Medical Review*, has been performed with some success by M. Jobert. In one instance, "much inconvenience was experienced from the after-growth of hair in the transplanted flap."

I have ventured to make these suggestions, which I do with great diffidence, with regard to the mode of operating, because there is no case in surgery in which a successful operation gives more complete relief than in that of vesico-vaginal fistula, or relieves a greater amount of wretchedness; and because it is by no means well settled what is the best mode of treating this distressing infirmity. The attention of so many enlightened surgeons being now directed to the subject, gives reason to hope that an effectual remedy will be found for this deplorable malady.

Boston, *June*, 1839.

Case II. — The patient in this case was a married lady, between thirty and forty years of age. She came more than one thousand miles, and placed herself under my care in August, 1840. She was the mother of several children. Her last labor was protracted; instruments were used; the bladder was injured, so that extensive sloughing took place soon after, and all the urine escaped through the preternatural opening. No means that had been adopted had had the slightest effect in controlling the continual flow of water; and the consequence was that her limbs, from the upper part of her thighs to the knees, were inflamed, excoriated, and extremely sensitive. Under these circumstances, she made the journey with the greatest difficulty; but so loathsome to her was her condition, that she was ready to make any sacrifice, if by so doing she had the least chance of relief.

I found it very difficult to make an examination, owing to the exquisite sensibility of the parts. I succeeded at length, and ascertained that a large portion of the bladder had sloughed off, so that in fact there was no receptacle for the urine. I told her that I considered the case very unfavorable for any operation, and that the prospect of benefiting her was almost hopeless. She replied that her life was a burden to her as it was; that she would take any chance, however small, and incur the greatest risk, rather than remain in her present condition.

I did not hesitate, therefore, to operate. With some difficulty I succeeded in paring the edges of the bladder, and dissecting up, to a small extent, the external covering of that organ. Three stitches were passed through the outer coat that was raised in this way, and the edges of the fistula were brought in contact, when the threads were

tied. The whole operation was more painful, and the sufferings of the patient more severe afterwards, than in the preceding case. This was attributable, in great measure, to the extensive excoriation and consequent sensibility of the parts concerned. No unpleasant symptom, however, occurred; and on examination, a few days after the operation, I found that union had taken place in the centre, leaving a fistulous opening on each side. The stitches, being loose, were removed.

The after treatment, I should have remarked, as to diet, position, and introduction of the catheter, was similar to that adopted in the case of the first patient. After an interval of a month I operated on each of these openings, and at the expiration of another month I operated for the third time. Something was gained by each operation. The patient was then obliged to return home. Her condition was much improved; at the same time, I was confident more could be gained by further operations.

She could now retain the urine for two or three hours; and remain in an upright position, and even walk, for that length of time, without its escape. In consequence of this power of retention, the excoriation of the limbs ceased almost entirely, and her general health was essentially improved.

She visited me again in the spring of 1842, and made the journey with much less inconvenience than on the former visit.

The fistulous openings had contracted since my last examination, and I was satisfied that further attempts should be made to improve her condition. Three more operations, therefore, were done, in April, May and June, 1842. The gain from each was very apparent. The

orifices were diminished; urine could be retained for a much longer time, and the contractile and expulsive power of the bladder was to some extent restored. She returned home in the autumn of the same year, and I have not seen her since, nor heard from her within the last few years. The latest accounts that I had were that her improvement had been gradual, but constant; the excoriation was gone; her general health good; that she could walk and ride on horseback without inconvenience, and that she had given birth to one or more children since her return. Her condition was entirely changed; life was no longer burdensome, and she was rendered by these operations a happy and useful member of society.

Case III. — The patient in this case came under my care in December, 1840. She was a young married woman, of twenty-two years of age, and the fistula occurred about a year before, after her first labor, which was protracted and severe. Her sufferings at the time I saw her were great, and her nervous system was very much disturbed. At the same time I was led to think, upon examining the parts, that an operation would afford her relief. I formed this opinion from the size and situation of the fissure. An operation was accordingly done, and in a manner similar to those described in the preceding cases. No untoward symptom occurred; the urine flowed through the catheter, which was daily removed, and after what was thought to be a sufficient length of time an examination was made. Adhesion seemed to have taken place along the whole extent of the fistula, and the stitches were accordingly cut away.

On the following day, however, the urine passed freely

through the fissure, and the opening was as large as before the operation. I was inclined to think, at the time, that the removal of the stitches might have had some effect in producing this unfavorable result. It was impossible to get at them without bringing down the bladder to some extent, and, of course, causing a strain upon the newly-formed parts. This might have been sufficient to rupture them; for it is well known that they do not, for a long time, acquire the strength of the original texture.

It was my wish to have made at least one other attempt for the relief of the patient. But she was nearly three hundred miles from home, and the season of the year and her domestic duties made her anxious to return to her friends. When she left, she spoke of coming back in the spring, and submitting to another operation. She did not, nor have I heard from her since. It is not probable that any improvement has taken place in her condition; it was not improved by anything that was done for her here; at the same time, the infirmity was not increased by the attempts made to remove it.

Case IV.— The circumstances of this case were very similar to those of the preceding one. The patient was a young married woman, of about the same age; her trouble followed her first and only confinement, coming on in the same way, and the fistulous opening resembling that of the preceding one in its size and situation. She resided at a distance of twenty miles, and came under my care in October, 1842. I should have felt great confidence in the success of an operation in this case, had not the preceding one resulted so unfavorably.

I, however, advised its performance, and it was cheer-

fully submitted to. Everything promised well for a few days after, and on examining the parts, at the usual time, with a view of removing the stitches, a firm adhesion seemed to have taken place along the whole extent of the fissure. I felt confident of success. In attempting, however, to bring the bladder a little lower down, in order to cut the threads, the adhesive matter which had been poured out and united the pared edges of the fistula suddenly gave way, leaving the opening as large as it was before any attempts had been made to close it.

Whether the parts would have remained united if the bladder had not been thus put upon the stretch, it is impossible to say; at the same time, there could be no doubt that it was the immediate cause of the separation, and this confirmed me in the suspicion which I had in the previous case as to the effect of straining the bladder in the attempt to remove the stitches.

At any rate, I was determined to pursue a somewhat different course, if I should have an opportunity of performing similar operations hereafter. I should have been glad to have made another trial on this patient; but she evidently had no confidence in a successful result, and therefore returned home, being very much in the same condition that she was when she came.

Case V. — In this case, as well as in all the others in which I have operated since, I did not attempt to remove the stitches, but allowed them to remain till separated by the process of ulceration. The ligature employed is what is called dentists' silk of a single thread, and is carried only through the outer coat of the bladder. The size of the ligature, and allowing it to remain till separated by

the efforts of nature, I regard as a great improvement, and well calculated to have a favorable influence on the result of the operation.

The patient in this case came about twelve hundred miles in the hope of obtaining some relief; not finding convenient lodgings, she resolved to take a private room in the Massachusetts General Hospital. The particulars of her case while in that institution are copied from the records drawn up at the time by the house surgeon, and are here given:

Sept. 15, 1843. — A. B., wife, twenty-three years of age. Patient reports that five years and five months ago was delivered of first child; was in labor four days, and delivered without instruments. Two weeks after delivery upper wall of vagina sloughed, leaving a transverse opening into bladder an inch behind meatus urinarius, and about two inches in length. Now, in consequence of having worn a catheter for a long time, the opening is reduced to the size of the end of a man's finger. Cannot retain urine except when perfectly quiet, and then for a very short time. General health very indifferent.

23. — Suffered much pain from examination, and has been quite sick since. Vagina very irritable.

Oct. 7. — Patient reports is subject to sick headaches. Has one to-day. No dejection for two or three days.

12. — Some cough and pain in chest. In evening worse, with bad cough and sharp pain in left side. Blister ordered, but not applied, from unwillingness of patient.

13. — Better; up and dressed. Some cough, and pain in chest.

15. — Bowels open, cough better. At nine A. M., to-morrow (before operation), R. — Tr. opii, gtts. lxxv.

16. — *Operation.* — Patient was placed upon a table as in the operation for lithotomy, except the tying of the hands. An elastic staff was passed through the urethra, and the neck of the bladder being brought down, a transverse fissure half an inch in length was disclosed at an inch and a half behind meatus urinarius. The edges of this were carefully pared with curved scissors and a narrow-pointed knife, and brought together by two stitches, with two small movable needles inserted into a long staff. A large female catheter was then passed and secured in situ. Patient, having been removed to bed, was directed to lie on right side. Liquid farinaceous diet.

17. — Slept three or four hours at night. Tolerably comfortable this morning. Took some arrow-root with relish.

18. — Took, last night, Op. pulv., gr. jss.; camph., gr. v. M., in two doses, with an hour's interval, and had applied to region of bladder poppy fomentations, with relief of pain. This morning in great pain. Slept some in night. Principal trouble is a great sense of burning in vagina. Some nausea.

19. — Suffers much pain. Took, last night, opii pulv., gr. ij.; camph., gr. vj., M., in two doses, and slept but little afterwards; now, tongue coated. Head, back and hips, ache; complains of constant heat. Pulse one hundred and twenty-two.

20. — Better this morning. Still in great pain. Took opiate last night, as before, and slept some. Less burning pain.

21. — Pain and burning continue; slept but little; pulse one hundred.

22. — Appears much better this morning. Catheter

was removed by patient, and returned by surgeon in the evening. Pulse ninety-two. R.— Tr. opii, pro re nata.

24. — Sitting up this morning. Feels quite bright. Went without catheter all day yesterday; was able to retain urine for an hour or two. Upon assuming an upright position, water passed through meatus, and by report of patient none through fistula.

26. — Has not for two days worn catheter. Able to retain urine, but not to expel it. Suffered some pain last night in bladder.

29. — This morning in considerable pain. Much smarting and burning in bladder. Stitches still remain in wound. Tr. opii, gtts. fifty.

30. — Suffered great pain last night from inflammation of bladder. Urine thick and mixed with mucus. Pulse eighty-eight, and stronger than usual. R. — Ammon. liq. acet., ℥j.; spts. nit. æth., ℥j. M. ℥j. every two hours. Warm bath.

31. — Still in great pain.

Nov. 4. — Not so well this morning. Catamenia came on yesterday. Always suffers great pain during access. Is able to be all night upon a dry sheet, and to pass, with some effort, nearly a pint of water in the morning.

5. — Rather easier this morning. Bowels open.

6. — Better.

17. — Fistula entirely closed. Is troubled at times with irritability of bladder. Has not yet gained control over meatus; but is not obliged to use catheter at all. Rides out every pleasant day. Reports comfortable.

18. — Attacked with severe pain and bearing down yesterday P. M., which produced great suffering. Took, in

course of night, three pills, each containing op., gr. j.; camph., grs. iij. M. Slept none in night. Rather easier this morning.

19. — Feels much better this morning. Pain nearly all gone.

26. — Remains well. Walks and rides out daily.

27. — Discharged, well.

Case V. *continued.* — Feb. 19, 1844. — On leaving the hospital, rode to Springfield, travelling all day. Passed urine once without difficulty, and on endeavoring to again, found herself unable to do so. Was in great pain all night, and since that time has had constant passage of urine into vagina. Still much comes through urethra. Has attacks of severe burning pain, which she describes as being as severe as if fire were applied to the part.

20, Evening. — In great pain. R. — Pulv. opii, gr. ij., and repeat gr. j. every half-hour till relieved.

22. — Much pain last night; relieved in morning by enema of laudanum, gtts. lxx.; starch, ℥iv. M.

23. — On examination, surgeon finds a small opening at the upper part of cicatrix, large enough to admit end of catheter, through which urine trickles down over the cicatrix, which last is covered with fungous granulations. Several ounces of urine in bladder.

Is directed to wear a gum-elastic catheter, and touch granulations with sol. argent. nitrat., grs. viij. ad ℥j.

26. — Much less irritation and pain.

27. — Last night was taken with violent pains, resembling those of labor, attributed by patient to recurrence of catamenial period. Catemenia have been irregular since leaving the hospital; has had them but once. Great tenderness of abdomen. Had poppy fomentations without

relief. Then tr. opii, gtts. lxxx., which was vomited. Four leeches to hypogast. This morning is more quiet, having taken about gtts. lx. tr. opii, not rejected.

28. — Pain returned about noon. Had morph. sulphat., gr. ss., and at night gr. $\frac{1}{4}$. Pain this morning much less.

March 3. — Seems quite comfortable.

9. — Examined yesterday. A small opening discovered in centre of old cicatrix. Is directed to wear a large catheter.

10. — Catheter caused much irritation, and was removed this morning by patient.

12. — Resume catheter.

17. — Continues about the same. Yesterday morning, while writing, had an attack of faintness, obliging her to lie down.

18. — Much pain last night. Had enema of tr. opii, gtts. lxxx.; aquæ, ℥iv. M., with considerable relief.

23. — Was to have been operated on to-day. Operation deferred on account of soreness of parts, and some incrustations about fistulous opening. Apply to incrustations twice, daily, sol. argent. nitrat., grs. viij. ad ℥j.

25. — In considerable pain for two or three days back; easier this morning; wears catheter constantly.

April 10. — On account of irritable state of bladder, has used for a few days, as an injection into that viscus, aq. sol. opii, grs. viij. ad ℥j., and experienced great relief from same, being almost entirely free from pain.

15. — Much the same. Discharged, not relieved.

On leaving the hospital she continued under my care, and between the 25th of April and the 15th of August following I operated on the fistula four times, gaining something at each operation, till at length it was so much

reduced in size, that she recovered not only the power of retaining the urine, but also to some extent the power of expelling it at will.

She returned home, and I have learnt, within the last year, that her health is good, that she suffers but little from this infirmity, and has given birth to a living and healthy child.

I ought, perhaps, to have remarked that this patient was more difficult to manage, both during the operation and after, than any one that had ever been under my care. This may account in some degree for the want of entire success in her case.

Case VI. — At the hospital.

June 11, 1845. — C. D., aged twenty-nine; married. Canterbury, N. H. Patient was confined with her first child three months ago. Reports that the "bag of waters broke," early one morning, without any previous pain. This was Monday. The following Thursday bearing-down pains commenced, and continued pretty regularly till Saturday night, when the child was delivered with the forceps. Motions of the child were felt during the night previous to its extraction, though dead when removed.

Had no passage of urine for thirty-six hours previous to introduction of forceps. About one hour afterwards urine came dribbling away from vagina in a slow, steady stream, and has so continued ever since. Irritation and scalding have been very severe.

Bowels pretty regular. Appetite good.

On examination by Dr. Hayward, a small transverse fissure was found on vaginal surface of bladder, about two inches within vagina. A catheter introduced into bladder

was brought through this opening. Surrounding parts were not in a condition for an operation, and it was deferred till

July 5. — Patient being placed on the edge of a bed, in lithotomy position, a whalebone bougie was introduced into bladder and pressed against os pubis, in order to bring forward the seat of the opening. This being well brought forward, though causing considerable pain, two wooden spatulæ were introduced into opposite sides of vagina. The operator then passed two needles curved at the point, and also capable of being removed, and completely closed the opening, the edges of fistula having been previously pared. A catheter was then introduced, and patient placed on her side in bed.

6. — Very comfortable since operation. All urine has passed through catheter.

19. — General health improving. Urine all seemed to pass readily through catheter till four days after the operation, when catheter became obstructed with mucus and blood. It was removed, and another substituted.

Ligatures came away on the seventh day. Catheter was removed two or three days after, and patient was able to retain her urine for nearly two hours. After this period it passed through the opening, which is much smaller than before the operation. Discharged, relieved.

Case VII. — This case occurred also in the year 1845. The patient was a married woman, about thirty years of age, residing more than a hundred miles from the city. She had suffered ever since the birth of her last child from this infirmity, and had been treated for a supposed incontinence of urine. The real nature of the difficulty was not suspected till a short time before I saw her.

She then became anxious to ascertain if something could not be done for her relief, and with this view I was consulted. Most of the urine escaped through the fissure; it could be retained for a short time only when she was in an upright position; she had but little control over the bladder, and her sufferings were very great, unless she kept entirely at rest, from the excoriation and tenderness of the parts.

On examination, I found the case to be such as in my opinion would justify an operation. This was accordingly done. The stitches were allowed to remain till thrown off by the natural means, and the same course of management was adopted as had been pursued in the other cases.

At the end of a fortnight I ascertained that, though the fissure was contracted, it was not entirely closed, and some urine continued to flow through it. I then proposed another operation, which was submitted to in about three weeks after. The result was, that the retentive and expulsive power of the bladder was in great measure restored, and the patient returned home in a much more comfortable condition than when she came to the city.

In a little more than a year after this she visited me again, and I was glad to find that she had been steadily improving since the last operation. By a little care on her part to introduce the catheter occasionally, nearly all the urine flowed by the natural passage. She did not feel the necessity of submitting to any further surgical treatment, nor did any seem to be called for. I have not heard from her since; but it is probable that the fistulous opening has contracted still more, so that she experiences but little if any inconvenience from it.

The two next patients were in the hospital, and the account of their cases is given below from the records.

Case VIII. — March 4, 1847. — E. F., aged forty; married. Patient was in labor with her third child for twenty-two hours; was assisted by a midwife; no instruments were used; child was still-born. Has had one child since.

On examination by speculum, a fissure, about three fourths of an inch in length, with thickened and indurated edges, is found at fundus of bladder, close to os tincæ.

14. — *Operation.* — Patient having been made insensible by ether, the fundus of bladder was brought downwards and forwards, so that the fissure was exposed at the os externum, by means of a whalebone rod passed through the urethra. The edges were then pared, so that the cut surfaces inclined from without inwards, and when in contact the mucous membrane was corrugated. Two sutures were then taken — not extending through the inner coat of bladder. By this the fissure was completely closed. A large-sized catheter was then fastened in the bladder.

Patient states that she suffered no pain from the operation. The parts were greatly relaxed by the ether, so that the bladder was brought down with perfect ease.

21. — On examination this morning, fissure was found much contracted, but still admitted a small amount of urine to pass through. Catheter was removed, and an elastic bougie introduced into bladder, when some coagula were found.

April 11. — Doing well. Slight leakage through fissure, but can retain water several hours. Sutures came away this morning.

P. M. — Reports that whole trouble has returned. Water runs continually through the fissure.

14. — Operation repeated. Patient was placed in bed,

with trunk elevated so that urine may gravitate below fissure.

17. — Doing well. May sit up. No leakage. Remove catheter, and pass an elastic one every three or four hours.

25. — Fissure has closed. No leakage. Is troubled with incontinence of urine. Is advised to pass catheter many times daily for a long time.

May 3. — Discharged, well.

Case IX. — G. H., Rhode Island, aged twenty-two; December 3, 1849. Has been married three years. Was delivered of first child eight weeks ago, after a severe labor of thirteen hours. Child weighed eleven pounds. Its head was larger than usual. No instruments were used. She passed water perfectly well in the afternoon, just before labor commenced, but not at all during the following night. Two days after this, perceived, for the first time, that her urine came away continually without her being able to prevent it. This has continued ever since. Now, pulse eighty; appetite good; bowels regular. On examination, per vaginam, an oval opening is found, two and three quarters inch from meatus, of sufficient size to admit tip of little finger. Through this urine constantly passes into vagina. External labia and upper part of thighs red and tender from the constant discharge.

December 16. — *Operation.* — Patient being fully etherized, fundus of bladder was brought as near as possible to mouth of vagina by a whalebone bougie passed through meatus, and fistulous opening exposed to view. Edges of fissure were then pared by a long, narrow bistoury, and united by two sutures, mucous membrane of bladder not being included. Catheter was placed in bladder.

17. — Some pain in hypogastrium. Last night one dejection.

19. — Very comfortable. No dejection. All the urine flows through catheter. R. — Ol. ric., ℥ii.; suc. lim., ℥i.

20. — One free dejection.

22. — Can pass water naturally. No leakage.

26. — One ligature came away to-day. The other is still firm. No leakage.

31. — Doing well. Ligature still firm. No dejection. R. — Ol. ric., ℥i.

January 2, 1850. — Ligature still remains. No leakage. Can retain urine for an hour without difficulty.

6. — Doing well. No dejection. R. — Ol. ricin., ℥iv.

7. — Two dejections.

9. — Ligature has not come away. No leakage. Can retain urine for one and a half hours, and expel it at pleasure. By request, discharged, well.

This patient, I have ascertained, has remained perfectly well. The remaining ligature came away without trouble.

Though I have extended this paper to somewhat of an unreasonable length, I hope I shall be excused for adding a few words, in order to explain a little more in detail the mode I have adopted in doing the operation, and of managing the patients afterwards.

Before the discovery of the anæsthetic powers of ether, I found that the most difficult and painful part of the operation consisted in bringing the bladder down to the os externum. It is now done with comparative ease, and without causing the slightest suffering to the patient. I have administered the ether in the three last operations of this kind, and have been able to bring the bladder down,

pare the edges of the fistula, introduce the ligatures and the catheter, and restore the bladder to its place, in twenty minutes; when in all the cases before, in which I did not use it, the same process required an hour, and during the most of that time the patient was suffering severely. Besides, the fistula is sometimes in such a situation, as when it is near the fundus of the bladder, that without this agent, or some similar one, it would be impossible to bring it in view.

The patient being thoroughly etherized, the bladder can be brought down by introducing a large-sized bougie (one made of whalebone, highly polished, is to be preferred) into the urethra, to the very fundus of the bladder, and carrying the other end up to the pubis. In this way the fistula is readily brought in sight. Its edges can be pared with the scissors or a knife, though usually both these instruments are required; and this part of the operation is much facilitated by holding the edges by means of a double hook. In all the cases that I have examined, these edges are thick, hard, and usually of a white color. It is not difficult, therefore, to dissect up the outer covering from the mucous coat of the bladder to the distance of two or three lines. The needles are then to be passed through the outer covering only, and as many stitches must be introduced as may be found necessary to bring the edges of the fistula in close contact.

Since my first operation, I have used a short needle with the eye near the point, made to fit on to a long handle. The instrument, when the two parts are together, looks not much unlike a tenaculum, though not so much curved, and considerably broader near the point.

As soon as the needle is passed through one side

of the fistula, it is immediately seized by forceps, the handle is withdrawn, and the needle is then carried through. It is to be then again fitted to the handle, and carried through the other side in the same way. As many stitches as may be thought necessary to bring the parts into close contact can in this way be taken with great ease. One thread of each stitch is to be cut off; it is convenient to leave the other, as it enables the operator and patient to know when the ligatures have separated from the bladder.

A large-sized female catheter is then to be introduced into the bladder, and secured there by means of a T bandage. The patient should be laid on her side, with the upper part of the body somewhat raised, so as to facilitate the flow of water through the catheter. This should be removed at least once in every twenty-four hours, as it is very likely to be obstructed by mucus, coagula of blood, and occasionally calculous concretions. In three days I think it safe to remove it altogether; but then it should be introduced at least once every three hours, for ten or twelve days more, so as to prevent any accumulation of urine in the bladder, and consequent strain on that organ.

The diet should consist entirely of liquid, mucilaginous food; such as an infusion of slippery-elm, gum-Arabic and water, flax-seed tea, arrow-root, and milk and water. This diet, in my opinion, should be continued till the ligatures come away.

The bowels should be opened by some mild laxative a few hours before the operation; but it is desirable that they should not be moved again till some days after.

I think it best for the patient to use the catheter once or twice a day for several weeks, and at any rate during

that time to avoid making any strong efforts to expel the urine by the contraction of the bladder.

It may be proper to add that I have never had any troublesome hemorrhage from the operation, nor any alarming symptoms after it. In some cases the pain has been severe for two or three days, and once or twice it has run down the limb, apparently in the course of the sciatic nerve. When performed in the way that I have recommended, I believe it to be attended with very little if any danger, as the bladder is not subjected to any considerable degree of violence, nor any part injured to a great extent.

Boston, *April*, 1851.

In the *American Journal of the Medical Sciences* for January, 1852, may be found a long paper on the treatment of Vesico-vaginal Fistula, by J. Marion Sims, M.D., of Montgomery, Alabama. Dr. Sims notices my article on the subject, and makes two extracts from it. He says that "the first successful case in this country is, I believe, by Dr. Hayward, of Boston;" but he takes no further notice of it, and proceeds to describe his own method, and the grounds on which he lays claims to originality. These are —

1. For the "method by which the vagina can be thoroughly explored, and the operation easily performed."
2. For the sutures he recommends; and,
3. The self-retaining catheter which he invented.

With regard to the first, I would merely say, that if the patient be thoroughly etherized, the vagina can be explored, and the fistula brought into view, so that its edges can be easily pared by the method which I have described.

I have found no difficulty in doing this, and the position of the patient is far less constrained than the one recommended by Dr. Sims; nor do I understand how the latter could be borne sufficiently long to enable the surgeon to go through the operation.

2. The sutures which Dr. Sims advises are fine annealed silver wires, fastened to cross-bars, so that by tightening the wires the pared edges of the fistula are brought into close contact. This he calls a "clamp suture," though it does not seem to differ from what is familiarly known by the name of the quilled suture.

That the divided tissues can be closely approximated in this way, there can be no doubt; but I should fear very much that in removing the sutures, which must be done in six, eight or ten days, the adhesive process might be disturbed, and the operation thus defeated. There is no danger from this source when the sutures are introduced as I have advised, and allowed to remain till they are thrown off by ulceration.

3. I have had no difficulty whatever from the accumulation of water in the bladder after the operation. The instrument that I have used I had constructed for this purpose. It consists of a large silver female catheter, with free openings in the part that enters the bladder, and a flat plate at the other end. Into the external opening is screwed a silver tube of three to four inches in length, which projects some distance beyond the external labia, and through this tube all the urine freely flows. This is easily kept in place by a T bandage, and has, in no instance that I have used it, given the patient any pain or inconvenience.

March, 1855.

ANÆSTHETIC AGENTS.

SOME ACCOUNT OF THE FIRST USE OF SULPHURIC ETHER BY INHALATION IN SURGICAL PRACTICE.

READ BEFORE THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT, APRIL 12, 1847.

That most persons can be rendered insensible to the pain of surgical operations by inhaling the vapor of sulphuric ether, is now well established. The safety of so doing can hardly be questioned, when it is known that it has probably been used in this way by several thousand individuals in this city within the last six months, without a fatal, and I believe I may add an alarming result, in a single instance. Ill consequences, too, are most likely to be met with when a powerful agent, like this, is first getting into use, before all its properties are well understood, and before the best mode of administering it has been ascertained. That some unpleasant cases have occurred, there is no doubt; that it has failed to produce the desired degree of insensibility in a few others, is certain; but in no instance of which I have heard have there been any serious or untoward effects that continued for any length of time.

At the same time, it must be admitted that a great degree of caution is required in its administration, and it

therefore can only be regarded safe in the hands of scientific and skilful persons. The dangers seem to me to arise principally from two sources. First, from allowing the inhalation to be too long continued; and, secondly, from not adopting suitable means by which the lungs can be well supplied with atmospheric air while the inhalation is going on.

With regard to the first, it may be observed that it hardly admits of a doubt, that the peculiar state of the system that is produced by the vapor of ether when breathed is that of narcotism; similar to what is sometimes caused, though usually in a less degree, by wine, alcohol, and various medicinal agents. The effect, therefore, being on the brain and nervous system, it is obvious that if it be long kept up, and carried to a great extent, alarming symptoms would be likely to ensue. But for how long a period it can be safely inhaled, has not yet been ascertained.

In respect to the second source of danger, it is very apparent that if the lungs be not well supplied with atmospheric air, the blood cannot be perfectly arterialized, and, of course, a greater or less degree of asphyxia will be the consequence. This, however, can be easily guarded against, by having the inhaling apparatus so arranged that the patient shall at each inspiration obtain an abundant supply of atmospheric air, while means are at the same time adopted to have this air well charged with the vapor of the ether. In this way the state of narcotism is, in most cases, readily induced, while that of asphyxia is entirely avoided.

It is not pretended, however, that there may not be circumstances in some cases that would forbid the use of

the ether altogether. It would not probably be deemed prudent to allow it to be inhaled by persons who have had hemorrhage from the lungs, or by those who were strongly predisposed to it; and it would, perhaps, be hardly safe to administer it to individuals who have formerly been or were at the time affected with mania, epilepsy, or hysteria.

Children, from the great development of the nervous system in the early periods of life, are sometimes affected unpleasantly by the inhalation of the ether.

But on all these points there is yet much to be learnt. It is only surprising that so much has been ascertained in relation to the subject, when it is recollected that the first experiments with ether for surgical purposes were made but little more than six months ago.

It is well known that surgeons have for a long time sought to discover means of lessening, in some degree, if they could not altogether prevent, the pain of surgical operations; but their efforts were unsuccessful, and the world is indebted to individuals not strictly of the surgical profession for a discovery that will do more than any other to lessen human suffering. I believe I am warranted in saying that this remarkable property of ether, when taken into the human system by inhalation, of rendering surgical operations painless, was discovered in this city; and that the first successful application of it was made here in September last, by Dr. Morton, a distinguished dentist. He extracted teeth from several individuals who were made insensible and unconscious in this way, without any subsequent ill effects.

It is understood that Dr. C. T. Jackson, well known by his great attainments in geology and chemistry, first suggested the use of the ether; but to Dr. Morton, I think,

must be awarded the credit of being the first who demonstrated, by actual experiment on the human subject, the existence of this wonderful property. Having satisfied himself that teeth could be extracted without pain, from those who had previously inhaled the ether, he was desirous of having it tried on patients who were to undergo longer and more severe surgical operations. For this purpose he applied, about the middle of October last, to have it used at the Massachusetts General Hospital; and Dr. J. C. Warren, the attending surgeon at the time, at once consented.

The ether was administered at the hospital by Dr. Morton, on the 16th of October, to a man upon whom Dr. Warren was to operate for a tumor on the face. The effect in this case was not complete; the suffering, however, was very much less than it would have been under ordinary circumstances, and the result was on the whole so satisfactory, that a second trial was made on the following day.

The patient to whom the ether was administered on the 17th of October was a female, with a fatty tumor on the arm, between the shoulder and the elbow. At the request of Dr. Warren, I did the operation. The patient was insensible during the whole time, and was entirely unconscious. The operation lasted about seven minutes, but could not be regarded as a very severe one.

These are the first surgical operations, except those of dentistry, that were ever performed on patients while under the influence of the ether.

On the 1st of November I took charge of the surgical department of the hospital, and on the following day, in conversation with Dr. Warren, I stated that I did not

intend to allow the surgical patients to inhale this preparation of Dr. Morton (for we were then ignorant of the precise nature of it) during my period of service, unless all the surgeons of the hospital were told what it was, and were satisfied of the safety of using it. Dr. Warren agreed with me as to the propriety of this course.

On the 6th of November Dr. Morton called at my house, and asked me if I was willing to have his preparation inhaled by a patient whose limb I was to amputate on the following day. I told him of the conversation I had had with Dr. Warren on the subject. Dr. Morton at once said that he was ready to let us know what the article was, and to give to the surgeons of the hospital the right to use it there when they pleased. He added, that he would send me a letter, in the course of the day, to this effect. I requested him to address it to Dr. Warren, as he was the senior surgeon; and told him that I would submit it to my colleagues at a consultation to be held on the following morning. He wrote the letter accordingly; the subject was maturely considered by the surgeons, who were unanimously of opinion that the ether should be inhaled by the individual who was to undergo the operation that day.

The patient was a girl of twenty years of age, named Alice Mohan, who had suffered for two years from a disease of the knee, which terminated in suppuration of the joint and caries of the bones. For some months before the operation her constitutional symptoms had become threatening, and the removal of the limb seemed to be the only chance for her life. The ether was administered by Dr. Morton. In a little more than three minutes she was brought under the influence of it; the limb was removed,

and all the vessels were tied but the last, which was the sixth, before she gave any indication of consciousness or suffering. She then groaned, and cried out faintly. She afterwards said that she was wholly unconscious and insensible up to that time, and she seemed to be much surprised when she was told that her limb was off. She recovered rapidly, suffering less than patients usually do after amputation of the thigh; regained her strength and flesh, and was discharged, well, on the 22d of December.

On the same day Dr. Warren removed a part of the lower jaw. There was but little if any pain in the first part of the operation; but, as it was necessarily protracted, the sensibility was in some measure restored before it was over; and, from the situation of the part operated upon, it was, of course, impossible to allow the patient to inhale the ether a second time.

The favorable effects of the inhalation of the ether in these cases induced the surgeons of the hospital to continue to employ it freely from that time to the present, both in that institution and in private practice; and I may add that they have done so without any serious accident in a single instance, and with the happiest results in most cases. Besides many other operations performed there by Dr. Warren and myself, several were done in the course of the winter, on patients who had inhaled the ether, by our colleagues, Drs. Townsend, J. Mason Warren, S. Parkman, and H. J. Bigelow.

It is unnecessary, however, to enumerate these, as no one can doubt the power of ether to render most persons insensible to pain, who has read the accounts of what has been done with it both in this country and Europe; and as my object in drawing up this paper is merely to state the

facts in the order in which they occurred, in relation to its first introduction into surgical practice.

I ought, perhaps, to add, that in four cases the experiments with the ether did not produce the desired effect. Two of these occurred to me at the hospital, and the other two in private practice. The first of these was that of an elderly lady, upon whom I was about to operate for disease of the breast. She attempted to inhale it for a length of time, but it had no influence upon her. It was afterwards ascertained that there was a defect in the apparatus that was used, and that none of the vapor of the ether entered her lungs.

The second case was that of a man with a fistula in ano, who was extremely sensitive, and apparently suffered very much from the slightest examination. After inhaling the ether for a short time, he became violent, like a person in a drunken delirium, so that it was not easy to control him. I was able, however, to go through with the operation, though not without some difficulty. The violent symptoms lasted for a few minutes only. He afterwards said that his suffering had not been great, and that he felt as if he had drunk alcohol to excess.

The third case was that of a young, married lady, who had a tumor, not of a malignant character, in the breast.

She was of a nervous, excitable temperament, and did not inhale the ether readily. After some time she became apparently insensible, and she evidently did not feel the first incision. But as soon as I began to dissect the tumor from the surrounding parts, she struggled so violently as to render it difficult to go on with the operation. It was fortunately completed, however, without any unpleasant occurrence.

Both of these cases happened at an early period, when our experience with the ether was quite limited. I am now satisfied that if the inhalation had been longer continued the desired effect would have been produced.

The fourth case was that of an elderly woman, whose limb I amputated below the knee, at the hospital, in January last. She inhaled the ether without difficulty, and was insensible during the first part of the operation. She, however, soon became slightly convulsed, her countenance assumed a livid appearance, and the blood that flowed from the incisions was darker colored. The mouth-piece of the apparatus was at the time in her mouth, and her nose was compressed by an assistant. The apparatus was immediately removed, and almost at the same moment she gasped, made a full inspiration, and her consciousness and sensibility were restored. She was in a state of partial asphyxia; and on examining the apparatus, which was used that day for the first time, it was found that the air did not enter into the receiver which held the ether without breathing very forcibly, more so than the patient was able to do; so that in fact she got no air into her lungs after she had exhausted that contained in the vessel from which she inhaled the vapor. This is an accident so easily guarded against, that it will not probably happen again. The unpleasant symptoms in this case passed off in a few moments, and the patient did well.

If it should hereafter appear that no other ill effects than those that have been already noticed will be likely to occur from the inhalation of the ether, it will be impossible to overrate the value of the discovery of its applicability to the purposes of the healing art. The mere power that it possesses of rendering surgical operations painless

puts it above all price; but this is by no means its only advantage. It disarms the operative part of our calling of the terror with which it is uniformly regarded by patients; it enables the surgeon to operate with more safety, ease and rapidity; it prevents, in great measure, the shock which the nervous system experiences from severe and protracted operations, and which not unfrequently destroys the chance of recovery; and, in addition to these, it will enable surgeons sometimes to operate under circumstances and in situations where it could not have been done if the patient had been in the ordinary state. In my short experience with the ether, I have already had an opportunity of witnessing its benefits in each of these different ways.

Its power of producing insensibility has been seen in most of the cases in which I have tried it.

I have operated on patients, whose sufferings have been mitigated, and whose lives will no doubt be prolonged, by the operation, who would not have submitted to it under ordinary circumstances; and it will be readily believed that a surgeon will operate with more coolness when he is confident that he is giving no pain; and he certainly can do it more safely, and with greater rapidity, when the patient is entirely at rest.

There is reason to believe that the young woman before spoken of, whose limb was removed at the hospital after she had inhaled the ether, would have sunk, from the combined influence of her previous debility and the shock of the operation, if she had retained the ordinary degree of sensibility.

But there are still other advantages. We sometimes meet with cases where the parts are so morbidly sensitive, or where they are so peculiarly situated, that an operation

could not be performed in the usual condition of the system. Both of these cases have occurred to me within the last few weeks.

The first of these was that of a medical friend in a neighboring town, who had suffered for several months with a disease of the side, supposed to be connected with caries of a rib. But the part was so sensitive that he could not bear the degree of examination necessary to ascertain the precise nature of the trouble. In fact, the slightest pressure there produced violent and spasmodic pain. He inhaled the ether, but was brought only partially under the influence of it. He retained his consciousness entirely, but the sensibility was so much lessened that he allowed me to cut down upon the diseased rib, and remove a portion of dead bone. He suffered but little in the first part of the operation; and probably would not have suffered at all during the whole of it, if he had been willing to have inhaled the ether a little longer.

About a month since, I operated on a patient for a vesico-vaginal fistula, which I am confident could not have been done had it not been for the insensibility and relaxation induced by the inhalation of the ether. The fistula was in the fundus of the bladder, and before the ether was inhaled it was found impossible to force the bladder down, so as to bring it within the reach of any instruments which would be required for the operation; and the slightest examination caused extreme suffering. After the patient had inhaled the ether three minutes, the parts became very much relaxed and entirely insensible, so that I brought the fistulous opening down to the os externum, by means of a piece of whalebone carried into the urethra. In this situation I pared the edges of the fistula, closed it with two

stitches, removed the whalebone, introduced a large catheter into the bladder, and then returned the organ to its natural situation, without giving the patient the least pain, and without her being in the slightest degree conscious. The whole time, from the beginning of the inhalation to the completion of the operation, was twenty-one minutes; and I have never been able to do the operation before in much less than an hour. The ether was administered in this case by means of a sponge well saturated with it, which was held to the nose and mouth, and reapplied occasionally, whenever there was any indication of returning sensibility.

This I believe is the first instance in which a fistula in the bladder in this situation has been operated on, except, perhaps, by cautery; and I am confident, though this first attempt may not be successful, that the patient can in this way be ultimately very much relieved, if not entirely cured of one of the most distressing infirmities with which human nature is afflicted.

I cannot close this article without saying that all the patients on whom I have operated while under the influence of the ether have recovered, and I should think more rapidly than they would have been likely to have done under ordinary circumstances. In no instance that I have seen has there been headache, or any cerebral symptoms, after the inhalation; nor have I been able to discover any unpleasant effects from it. How far and in what cases it will be used in the practice of medicine, it is not easy now to determine; but that it will be employed by physicians to a great extent, I have no doubt.

Boston, *April* 12, 1847.

REMARKS ON THE COMPARATIVE VALUE OF THE DIFFERENT ANÆSTHETIC AGENTS.

It is well known that sulphuric ether, chloroform and chloric ether, when inhaled, will render most persons insensible to pain. Advantage has been taken of this, to a great extent, within the last three or four years, in surgical and obstetric practice; and numerous operations, many of which were severe and protracted, have been performed with success, in various parts of the civilized world, upon individuals in whom insensibility was in this way induced. That all these agents have this power, cannot be doubted; but it may be questioned whether all of them can be used with equal safety.

It is important to settle this point, if possible; and this can only be done by comparing the effects of these different articles on the system, when taken by inhalation. Numerous trials must be made of all of them, and the result carefully noted. By examining these, and comparing them with each other, a correct opinion may perhaps be formed on the subject.

With a view of contributing something to this desirable result, I will state my own experience, premising that from the time the discovery of the anæsthetic power of sulphuric ether was made, to the present moment, I have had almost daily opportunities of seeing persons rendered insensible by one or other of the three articles that I have named. Upon many of these individuals I have operated myself, and upon others I have seen operations performed by other surgeons, either at the Massachusetts General Hospital or in private practice. My experience, therefore, is not inconsiderable.

I will briefly state what I consider to be the advantages and disadvantages of each of the anæsthetic agents, in the order in which I have named them.

1. Of Sulphuric Ether. — The discovery of the anæsthetic power of sulphuric ether was made in Boston, U. S. of America, in the autumn of 1846. It was administered by a dentist, with success, on the 30th of September of that year, to a person from whom a tooth was extracted. On the 16th of October following it was inhaled by a patient at the Massachusetts hospital, who was operated on by Dr. Warren; but complete insensibility was not produced; and the next day, at the same institution, I removed a tumor from the arm of a female, who was rendered unconscious and insensible by it, though the operation lasted seven minutes. At that time the precise nature of the article used was not known, except to those connected with its discovery.

Before the next operation, which I performed on the 7th of November, I was told what the agent was, by the dentist who had employed it for the extraction of a tooth. This operation was the amputation of the thigh of a female. It was done in the presence of two or three hundred spectators, and was entirely successful. The patient declared, before she was removed from the operating theatre, that she had been wholly unconscious and insensible till the very close of the operation. She suffered but little after, and, though much reduced at the time, from long-continued disease and severe suffering, she recovered rapidly, and now enjoys good health.

There was no doubt in the minds of those who were present on this occasion of the wonderful powers of ether; yet every one felt that much was to be learned as to the

safety of its administration, the best mode of doing it, and the extent to which it might be carried. From that day, however, its use rapidly spread throughout the civilized world; and within a few months operations were performed on patients under its influence in the four quarters of the globe. It is remarkable that the only spot in Christendom in which the discovery was received with coldness, and where no disposition was shown to test its merits by fair experiment, was in our own country; and in cities, too, which have heretofore been foremost among us in their efforts to advance the cause of medical science.

The course of the scientific men of Europe was widely different. They subjected it to the most rigid scrutiny, and satisfied themselves, by well-conducted experiments, not only that all that had been said of it was true, but "that the half had not been told them."

It is gratifying to be able to add, that, after countless trials of the powers of ether on the human system, made in Europe, under the direction of some of the most accomplished professional men living, nothing was added to what was already known in this country, as to its effects or the best mode of exhibiting it.

I have said that the discovery of the anæsthetic power of sulphuric ether was made in Boston in the year 1846; and I can add that it was there carried to its present condition by the judicious and honorable course of the members of our profession in relation to it. I am aware that, since that time, several individuals have come forward and declared that they had, at an earlier date, used it in the same way, for the same purpose, and with the same good results. If they had done so, the world was none the wiser or better for it; and I cannot forbear adding that

it is utterly inconceivable to me, that any one, who has witnessed its successful effects in a surgical operation, could be so regardless of human suffering, and so indifferent to his own fame, as not to have promulgated them far and wide.

When sulphuric ether was first administered by inhalation, it was by means of a pretty formidable-looking and expensive apparatus. Various instruments for this purpose were constructed, both in this country and Europe. The same objections applied to all of them. They were so formed as to create a well-founded apprehension that the supply of atmospheric air would not, in every case, be sufficient. It was difficult to guard against this; and, from this cause, some patients, soon after the discovery was made, nearly lost their lives by asphyxia.

Besides, to use them with entire success required, in a greater or less degree, the coöperation of the individual to whom the ether was administered. This, of course, could not always be had; and the consequence was, that very frequently a sufficient degree of insensibility was not produced, and even when it was it could not be kept up as long as in many cases was desirable.

The cost of the apparatus, too, was a serious objection, though a vastly less important one than either of the others that I have named. At the same time, it was so great, that if some simpler and less expensive mode of administering ether had not been found, it may well be doubted whether the benefits of the discovery would have been as rapidly and extensively diffused as they have been.

But all these objections are entirely obviated by the use of a bell-shaped sponge, of fine texture. This should be

large enough to cover the nose and mouth. The patient is required to do nothing. The apparatus is simple, and not costly.

This mode was adopted at the Massachusetts hospital in a few months after the first use of ether there by inhalation; I am not aware that it was previously used anywhere else, and I presume that it is now the only method by which ether is inhaled.

The quantity necessary to produce the desired effect must vary in different cases. In surgical operations requiring from five to ten minutes for their performance, from three to six ounces is usually sufficient. The ether, however, should be of the purest kind; that is, the rectified, which has undergone a second distillation, by means of which it parts with a considerable portion of its alcohol. Yet a much greater quantity than what has been named can be used with perfect safety; and the patient may be kept for a much longer time under its influence without danger, by occasionally removing the sponge, and reäpplying it when he gives signs of returning sensibility.

By administering it gradually many unpleasant effects are avoided. The great irritation of the larynx and air passages, accompanied by urgent and convulsive cough, is, in most cases, entirely prevented. The vapor of the ether should be so mixed with atmospheric air that respiration should be neither laborious nor painful. The irritability of the parts with which the ether comes in contact is by degrees overcome, and then the sponge may be applied directly to the face, and, if necessary, compressed in some measure, so as to exclude to a greater degree the atmospheric air. When the desired effect is produced, which is usually in from three to five minutes, the patient has no

control over the voluntary muscles; he cannot speak; he cannot open his eyes, when directed to do so; his muscles become completely relaxed, and the pulse, which, at the beginning of the inhalation, is frequent, and often rises during the process to one hundred and forty beats in a minute, or more, becomes slower, and I have very often known it to fall to sixty. The patient is then insensible and unconscious, and the surgeon may begin his operation with great confidence that he will inflict no suffering. The sponge should then be removed, and reäpplied from time to time, as circumstances may require. If the ether is not pure, longer time is necessary to produce the desired effect; the brain and nervous system are more excited, and the patient is occasionally violent for a time, and with difficulty controlled.

Before using the ether, the sponge should be dipped in warm water, and then strongly compressed, leaving it slightly damp. The evaporation seems to go on better in this way than when a sponge is used that has not been previously moistened. In the first instance, the ether should be poured on the inside of the sponge; about two ounces is enough; when more is required, it should be applied to the outside, as it is best not to remove the sponge from the face.

Sulphuric ether, of a proper quality, used in this way, I am confident is perfectly safe, and will, in almost every instance, produce the desired effect. I have administered it to persons of all ages, of every variety of constitution, and in almost every state of the system; and I have never known, in a single instance, a fatal or alarming result. I have given it to infants of seven weeks old, and to individuals of seventy-five years, with entire suc-

cess. I have administered it to persons suffering under chronic pulmonary disease, not only without injury, but, in some cases, with decided benefit. It is well known that it often gives relief in catarrhal affections of the lungs, and in paroxysms of asthma. In fact, I hardly know a state of the system in which I should be deterred from using it, if I were called upon to perform a surgical operation.

The advantages, then, of sulphuric ether as an anæsthetic agent, are its entire safety, the ease with which it is administered, and the slight inconvenience which follows its administration. I have already stated that I have never known its inhalation followed by a fatal or alarming effect; and there is reason to doubt whether death has, in a single instance, been produced by it, when it has been properly administered. One patient is said to have lost his life by its inhalation at the hospital in Auxerre, in France. This took place in August, 1847. The details of the case are not given with such minuteness as to enable any one to form a satisfactory opinion. It occurred, however, not long after the discovery; before the best mode of exhibiting it was adopted; and the *post-mortem* appearances indicated, as far as any opinion could be formed from them, that death was caused by asphyxia. In a careful examination of some of the leading medical journals of Europe and this country published during the last three years, I have not been able to find another case in which life was destroyed by the inhalation of sulphuric ether; and there is reason to believe, as I have already intimated, that death would not have taken place in this instance, if the lungs had been abundantly supplied with atmospheric air. It is only wonderful that an agent of such power, used, as it often has been, in the most reckless

manner, by unskilful and ignorant persons, should not have caused far more disastrous results than any that have hitherto been made known. It teaches us that, though it should be used with caution, and confided only to skilful hands, the dangers from its use are far less than our preconceived opinions had led us to believe.

The great ease with which it can be administered is not to be overlooked in estimating its advantages. No complicated apparatus is required, and no coöperation of the patient is necessary. A simple sponge, moistened with sulphuric ether, and held before the face for two or three minutes, will, in almost every instance, produce the desired effect.

There are no ill consequences from its use. If it be breathed only for a short time, its effects usually pass off in a few minutes. I have never known them to continue for more than an hour; and in this case the patient had been kept under its influence for forty-five minutes. Nausea and vomiting are not frequent, unless it is inhaled soon after food has been taken. I have not seen convulsions follow its exhibition, nor any delirium, except a slight and transitory kind, such as arises from intoxicating liquors. I confess that I was much surprised to learn, by carefully watching its effects, to what a small extent, and for how short a time, it disturbed the functions of the nervous system, and how rare it was to find headache among the consequences of its inhalation.

If, however, the state of narcotism should continue longer than is necessary for the purposes for which it was produced, the means that seem to me the most likely to remove it are the dashing of cold water in the face; the application of strong stimulants, as the carbonate of am-

monia, to the nose; and, as soon as the patient can swallow, the administration of a small quantity of hot spirit and water. The object is to increase the action of the heart, so that the blood may circulate more rapidly through the lungs, and thus be enabled to part with the vapor of the ether that is mixed with it. When narcotism arises from any noxious substance taken into the stomach, we adopt means to empty that organ as soon as possible, by the stomach-pump or an emetic. The principle of the treatment in the two cases is the same; the object being in both to remove the cause of the peculiar state of the system under which the patient is laboring.

The only objections of which I am aware to sulphuric ether as an anæsthetic agent, are its pungent odor, which is offensive to some persons, and the no inconsiderable degree of irritation which its inhalation occasionally produces in the air passages. This irritation, I am confident, may be in great measure prevented, by proper attention to the mode of its exhibition and the quality of the article used. Admitting these objections to be as great as they have been said to be by those who have urged them with the most earnestness, they do not, in my opinion, counterbalance the advantages; and I have no hesitation in saying that I should give it the preference over any other article with which I am acquainted that is used for the purpose of producing insensibility.

2. Of Chloroform. — Chloroform is the perchlorid of formyle, the radicle of formic acid. It has been ascertained by Dumas to consist of three parts of chlorine to one of the bi-carburet of hydrogen [formyle]. It was discovered almost simultaneously, nearly twenty years since, in France, Germany, and this country.

It was first employed as an anæsthetic agent by Professor Simpson, of Edinburgh; and he thought that it possessed "various important advantages" over sulphuric ether. He says that "it is far more portable; more manageable and powerful; more agreeable to inhale; is less exciting than ether; and gives us far greater control and command over the superinduction of the anæsthetic state." If all this were true, it would, no doubt, be preferable to any other agent with which we are acquainted. But subsequent experience proves that it is not so.

Its only advantages are that it is more agreeable to inhale than ether, and that a less quantity of it answers the purpose. On the other hand, it cannot be denied that fatal effects have followed its inhalation in several instances, even when administered by the most judicious hands; that in some cases convulsions have been produced, and in others a great disturbance of the brain, causing delirium. In some persons this affection of the mind has continued for several weeks.

There are other objections, of a minor character. Chloroform is of an acrid, caustic nature, and if it come in contact with the skin, unless it be protected by some oily substance, severe excoriation is the consequence. Its administration is generally followed by vomiting and headache, which continue for several hours, attended by a great degree of restlessness and want of sleep. Several cases have come under my care in which the brain and nervous system have been affected to an alarming extent; though in every instance it was said that a small quantity only of chloroform was administered, for the purpose of performing some operation on the teeth.

An individual in this vicinity was thrown into violent

convulsions, which continued for three or four days, during all which time she was in a state of complete insensibility, from the inhalation of the vapor of a few drops of chloroform, administered by a careful and judicious physician. It would be easy to multiply examples of this kind; but it is not necessary, for there is a stronger ground on which we can rest our opposition to the use of chloroform,— that is, its danger to life. This, it is well known, has already been, in several instances, destroyed by it. If it can be shown that it has caused the death of a single individual when properly administered, we cannot fail to have our misgivings of the safety of its exhibition, though it may have been inhaled in almost numberless cases without any ill effect.

I am satisfied that there are already on record at least twenty well-authenticated cases of death from the inhalation of chloroform; and I know not how a conscientious man, knowing this fact, can willingly take the responsibility, and expose his patient to this fearful result. One of the conclusions to which M. Malgaigne arrives, in his report on chloroform to the Academy of Medicine of Paris, cannot be too strongly impressed on the minds of those who feel inclined to use it. "Chloroform possesses a toxic action peculiar to itself, which has been taken advantage of in medicine by arresting it at the period of insensibility; which action, however, may, by being too much prolonged, cause immediate death." The danger is, that we cannot always know the precise time to arrest it, and that the fatal blow may be struck before we make the attempt. In other words, chloroform is a poison, and the insensibility which it produces is only the first stage of its poisonous action.

3. Of Chloric Ether. — There are two kinds of chloric ether. The one, the strong or concentrated; and the other, the chloric ether of commerce. They are both tinctures of chloroform, differing from each other only in the relative proportions of the alcohol and chloroform of which they are composed. The concentrated consists of one part of chloroform to nine parts of alcohol; and in the chloric ether of commerce there is one part of chloroform to fifteen of alcohol. The former is the one that is sometimes used for inhalation.

It is said to have been first recommended for this purpose by one of the most eminent surgeons of Great Britain, William Lawrence, Esq., of London; but I cannot learn that it is now employed in Europe to any extent in this way. In fact, it is hardly spoken of at all in the foreign medical journals that I have seen; and I have examined a large number with this view. It has been tried, however, pretty extensively, by Dr. J. C. Warren and Dr. J. Mason Warren, both at the hospital and in private practice, and I am not aware that any ill effects have followed its use. On the contrary, I believe that they are well satisfied with it, and prefer it to the other anæsthetic agents.

At the same time, it cannot be denied that it derives its power of producing insensibility from the chloroform it contains; and it is difficult to understand how the addition of alcohol can deprive it of its dangerous properties, when it is well known that the mixture of this substance with sulphuric ether renders it, in great measure, unfit for inhalation.

The advantages which it is said to possess are, that its odor is less pungent and disagreeable than that of sul-

phuric ether, and that it can be inhaled with little or no inconvenience. At the same time, it must be admitted that it is necessary to use as much chloric as sulphuric ether, and to continue the inhalation for as long a time to produce the desired effect.

The disadvantages are, that, when it comes in contact with the unprotected skin, it acts upon it in the same manner as chloroform. From this cause a patient suffered several months at the hospital, and I believe much more severely than if he had undergone the operation without the ether. I am confident, too, that it is more apt to produce vomiting, and a greater disturbance of the brain and nervous system, causing headache, restlessness and vigilance, which not unfrequently continue for many hours after its exhibition. Perhaps these last symptoms may be owing to the great amount of alcohol it contains.

I cannot, I confess, divest myself of the belief that chloric ether is an unsafe anæsthetic agent, when I consider that it is simply chloroform diluted with alcohol. It is true that, as far as we know, no fatal effects have hitherto followed its inhalation; but it is also true that it has, as yet, been used to a very limited extent, and in all the cases in which it has been exhibited, that have come to my knowledge, it has been managed with great caution and judgment. But I fear that if it be used with the same freedom that sulphuric ether is, we shall soon have to record some very different results. We cannot feel confident that it will always be confided to skilful hands only; nor by any means certain that death, when not looked for, may not follow its exhibition.

Boston, *April* 10, 1850.

My experience, since the publication of the preceding papers on the anæsthetic agents, has satisfied me of the correctness of the views I then took. If there be any change, it is that I attach more value to sulphuric ether, and have more perfect confidence in the safety of its inhalation than I had at that time. Of its efficacy I have no doubt. I have never, in a single instance, during the last five years, failed of producing by it entire insensibility to pain, without causing much inconvenience in its administration, and without any serious or troublesome consequences afterwards. Nor do I find any evidence that it has ever proved fatal, though it has been often exhibited in a reckless and unskilful way.

Any misuse of such an agent cannot be too strongly reprobated; but, if a proper degree of caution is taken, there is no danger of asphyxia, and scarcely any suffering while the patient is breathing it. But the ether must be pure; and when it is so, its specific effects are more speedily produced, with little or no subsequent constitutional disturbance. When, however, there is an undue proportion of alcohol mixed with it, insensibility does not come on so soon, and when it passes off the patient is often distressed with headache, nausea, and vigilance.

Nothing has occurred to change my opinion in relation to chloroform. Many additional cases of death from its inhalation have been published, and scarcely a medical journal comes to us from Europe that does not add one or more to the melancholy catalogue. It is wonderful to me that intelligent and educated men should continue to use an agent of such terrific power. That its effects are oftentimes salutary, every one will admit; but that they are not unfrequently deadly, no one can deny.

It is now acknowledged, I believe, that chloric ether is, as I have stated, only a tincture of chloroform. It is very certain that when deprived of its alcohol nothing but chloroform remains, and that it is readily made by mixing the two together in certain proportions.

The apprehensions which I expressed with regard to chloric ether have been already realized. It has never been employed to much extent as an anæsthetic agent; but death has been produced by its inhalation in three if not four cases in which the purest article was used, and the greatest care taken in its administration. When it is recollected how rarely it is exhibited, this would seem to show that its inhalation is quite as dangerous as that of chloroform.

It is to be hoped that chloric ether and chloroform, as anæsthetic agents, will be abandoned altogether; and that dentists and others will not continue to jeopard human life by the use of such means because the odor of sulphuric ether is not altogether grateful to their senses.

March, 1855.

REMARKS ON BURNS.

FROM THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY, JANUARY, 1824.

Burns and scalds often terminate fatally in a sudden and unexpected manner, at the moment when the injured parts are assuming a healthy appearance, and beginning to cicatrize. The extent and situation of the injury seem to have more influence in producing this termination than its depth.

Though volumes have been written upon the accidents from fire, and almost every system of surgery contains descriptions of them, with the various modes of treatment that are usually adopted, I am not aware that the precise point to which I allude, namely, death from superficial burns, has been explained or even noticed by any writer. Considerable attention has been given to the fatal termination of deep-seated burns, and the cause of death has of late been considered to be, in most instances of the kind, an affection of some of the internal viscera. Difficulty of breathing is frequently one of the most prominent symptoms of these fatal cases; and Cooper, in his Surgical Dictionary, in noticing the fact, suggests as an explanation of it that it may be owing to the partial suspension of that function of the skin which it has in common with the lungs,

by which water is thrown out from the circulation; and that the embarrassment of this function on the cutaneous organ produces an inflammation of the lungs. He does not, however, appear to be perfectly satisfied with this explanation himself, and observes that the kidneys, which perform a similar office, remain unaffected. He further remarks that it may be the result of sympathy, or be owing to some cause hitherto unexplained.

Sabatier observes, in the second edition of his *Médecine Opératoire*, that in burns where the epidermis is removed, and the texture of the skin destroyed, "the pain and irritation are excessive. The part swells and inflames. Fever comes on, and if the injury be upon the neck, the thorax or the abdomen, the patient has a difficulty of breathing. The danger is very great. I have seen persons die where the burn was hardly larger than a crown."

In some of these cases of severe burns, however, the fatal termination appears to be in no way connected with an affection of the respiratory organs; coma or diarrhœa, or strong symptoms of derangement of the nervous system, as watchfulness, delirium or convulsions, are the precursors of death, and in some instances the whole system is so prostrated, by the extent and severity of the injury, that no reäction takes place, the circulation is languid and the extremities are cold, and the miserable sufferers linger but a few hours, or at most days.

Every work on the subject of these accidents notices the fatal termination of many of them with symptoms similar to those mentioned above; but it is only of late that any attempt has been made to assign the immediate cause of death in these cases, and thus to elucidate an obscure and interesting point of pathology, if not to improve the cur-

ative method. In France, M. Dupuytren has called the attention of the profession to the subject, in a new edition of the work of Sabatier, before referred to, which has recently been published at Paris under his direction. This edition I have never seen; but it is said that he refers the death in these cases to an inflammatory affection of the mucous membrane of the stomach and bowels.

In the *Edinburgh Medical and Surgical Journal* for July, 1823, there are five fatal cases of burns, with dissections by Dr. Cumin, of Glasgow. In all these he found internal inflammation, either in the brain or its membranes, the thorax or abdomen, and the serous membrane appeared to be more frequently diseased than the mucous. These cases were all severe ones; the injury was deep, and in some of them extensive ulceration took place, with a copious secretion of pus. On examination of the *first* case, the only morbid appearance discoverable was a firm adhesion of the left pleura pulmonalis to the pleura costalis. The patient lived thirty-five days after the accident, and the fatal termination seemed to have been accelerated by a colliquative diarrhœa and a copious purulent discharge from the injured parts. There does not appear, from the report, to have been any difficulty of breathing for three weeks before death.

The subject of the *second* case died on the sixth day after the accident. There was no more difficulty of breathing than usually precedes death. "On inspection, the pia mater was observed in many places morbidly vascular, with several patches of extravasated blood in different parts of its surface. The vessels of the velum interpositum and plexus choroides were very turgid. An ounce of bloody serum lay in the basis of the skull. About two

ounces of serous fluid were observed in each side of the thorax; little fluid in the pericardium; lungs healthy." There was a slight appearance of inflammation in the peritoneal coat of the small intestines, and there were three ounces of serous fluid in the cavity of the abdomen.

In the *third* case there were no symptoms of pulmonary affection, and the morbid appearances were confined to the abdominal viscera.

In the *fourth* case there was some difficulty of breathing in the early part, which disappeared before its termination. On inspection, a single old adhesion, of much firmness, on the left side of the chest, was found, and there were several red spots on the pleura. The mucous membrane of the bronchiæ was very vascular, but the peritoneal and mucous coats of the small intestines exhibited the greatest marks of disease, assuming in the latter almost a gangrenous appearance.

"The subject of the *fifth* case died on the third day after the accident, with all the symptoms of extreme prostration, but without any affection of the lungs. The morbid appearances were confined to the peritoneum; the lungs were more than usually loaded with blood, but otherwise healthy."

The above cases satisfactorily establish that internal inflammation is frequently the consequence of burns on the surface of the body, and that it is often, probably, the immediate cause of death in these cases. There certainly seems to be some foundation for the opinion of Dr. Cumin that "the occurrence of inflammation and effusion in internal parts may be regarded as the result of an effort of Nature to relieve herself from the consequences of so severe an injury;" and the seat of the internal disease seems

to be determined in some measure by the situation of the external injury, usually occurring directly under the burned part. If subsequent observations should confirm these views, considerable *practical* benefit might be the result, and the general treatment that would be pursued in these cases would be such as is usually adopted to counteract internal inflammation from any other cause.

The kind of accidents, however, to which I alluded in the commencement of this article, and which it is my particular object to notice in these remarks, differs somewhat from those just described; it belongs to the second class of burns, as they have been divided by writers, whilst the others must be ranked under the third. In the first of these three divisions there is only increased redness, heat, swelling and sensibility, of the part; in the second, there is a serous exhalation under the epidermis, producing vesicles, which gradually increase in size, similar to those from artificial vesication; and in the third, the skin, cellular texture, and sometimes even the bones and muscles, are destroyed. In burns of the second class which terminate fatally, the injury is extensive, though superficial, and is rarely attended with either ulceration or suppuration of the injured parts. It is not unfrequent to meet with accidents of this kind, particularly in children, which terminate fatally, and in which no untoward circumstances occur for several days, and all the symptoms of which assume so favorable an aspect as to lull the apprehensions of the physician and friends as to any unpleasant termination. At the moment the wounds are assuming a favorable appearance, and are, perhaps, partially healed, the little patients are seized with extreme difficulty of breathing, and are hurried off with all the symptoms of thoracic

inflammation. Some opinion may be formed as to the danger of these cases from the seat of the burn; fears are always to be entertained if it be of any extent, and upon the neck, thorax, or abdomen. The following interesting case, communicated to me by my friend Dr. Hale, is precisely of the description to which I allude.

"Oct. 14, 1823, Elizabeth Dean, aged six and a half months, fell upon her face into the burning embers and hot ashes upon the hearth. She was taken up instantly, and her face immediately washed with cold water. Pieces of linen, dipped in cold water, were then bound upon it. I saw her about two hours after the accident. The burn extended over the whole front part of the face, including a part of the forehead, the nose, lips and chin, and a considerable spot upon the chest, making in all, as we thought, an extent of surface equal to about six inches square. In a considerable part of this extent, however, the injury did not appear to be very severe; the worst part was upon the upper lip. Some of the hot ashes had also been drawn into the mouth and burned the tongue; but there were no symptoms which indicated that any had been drawn into the throat. The child had nursed since the accident, and there were no appearances of violent febrile excitement. I dressed the burn with a liniment of olive-oil and lime-water (two parts of the former to one of the latter) spread upon cotton, and directed castor-oil, sufficient to move the bowels, to be given, and as much opiated tincture of camphor as should be necessary to procure some rest, beginning with thirty drops to a dose.

"From this time until the 18th the burn seemed to promise well, and the constitutional symptoms were by no means severe. The dressings were soon changed to the

lime-water of the pharmacopœia, and subsequently a mixture of the ointment of acetate of lead and marsh mallows ointment was used. The bowels, both in respect to the frequency and the appearance of the discharges, were in good order, the pulse was good, and the state of the skin varied but little from that of health. The dose of the tincture of camphor was gradually increased, but she did not require large quantities to procure a tolerable share of rest. On the 17th she had a slight cough, which was soon removed by a few tea-spoonfuls of syrup of seneca, with a small quantity of opiated tincture of camphor. She had a slight cough from a cold when the accident happened, but had not before coughed much, if at all, since that time. On the 18th I visited her about ten in the morning. The burn appeared much better than at any previous visit; it was rapidly healing. She had passed an unusually quiet night, sleeping almost the whole night in bed with her mother. She had taken the opiated tincture twice in the course of the evening and night, less than half a fluid drachm at a time. The skin was natural, both in respect to temperature and dryness. Indeed, every appearance was better than at any time before, except that she had refused to nurse since early in the morning, and there was a slight irregularity in the breathing. This was not more than might be occasioned by any temporary obstruction in the mouth and nostrils; and as the burnt skin, forming a sort of superficial sloughing, was separating from the lips and mouth, it was possible that that might be the cause of it, and that the tenderness of the lip, when thus exposed, produced the disinclination to nursing. As the bowels had not been moved for nearly twenty-four hours, I directed castor-oil to be given.

"At two o'clock I was called in great haste, with the report that the child was dying. I found her breathing with great difficulty, the face was livid, and the extremities were cold; in short, there was every appearance of approaching death. The castor-oil had not operated. I gave an enema of warm water, and had a warm bath prepared immediately. Before the bath was ready, she had several intermissions in the breathing, when the face became still more livid, and the blood oozed out at the burnt places upon the lip. She was somewhat revived by the bath, and breathed considerably better for some minutes after she was removed from it; but she soon sank back into as hopeless a state as before. She had frequent intermissions of breathing, several of which were so complete as to lead us to believe that she would not breathe again. At eight in the evening I visited her again, in company with Dr. Ware. Her respiration was more regular, but was very quick and laborious, with slight intermissions, and was accompanied by the stridulous sound peculiar to croup. As she had lived so long beyond our expectations, it was thought expedient to repeat the warm bath, and to make use of gentle friction with the camphorated soap liniment. I soon after placed her in the bath; but she did not breathe after she was taken from the lap of the nurse until she was returned to it again, and appeared to be dead. But, after rubbing her a short time, she breathed again, somewhat more freely than before. The croup-like sound was gone, and did not afterwards return. At six o'clock on the morning of the 19th I was called upon to know what should be given her, as she had revived so much as to be able to swallow, which she had not done since twelve o'clock the day before. I visited her soon after,

and found her appearance very much altered. The respiration was regular and not very laborious, although still quick; the pulse regular and distinct, about one hundred and sixty in a minute. The whole surface of the body was warm; a part of the day it was preternaturally hot and dry, but the most of the time the temperature and moisture were nearly natural. She coughed frequently through the day, and with considerable strength. She swallowed with avidity whatever liquor was put into the mouth. The tongue was kept in motion almost constantly, being thrust out upon the lips and drawn in with scarcely any cessation. It was clean, and the edges where it was burned were red. She had several discharges from the bowels in the course of the day, of a tolerably healthy appearance. We gave her no medicine, but fed her frequently with thin arrow-root, in which was a small quantity of brandy. There had been a serous discharge from the burnt surfaces until the collapse on the 18th, when it wholly disappeared. It returned in a slight degree on the 19th. The burn was dressed with the unguentum althææ. In the evening she was permitted to take the breast, which she did with avidity. She passed a very tolerable night, and on the 20th continued very much in the same state, except that she was evidently more feeble; the respiration was quicker and shorter, and the appearance of the discharges from the bowels was less healthy. These unfavorable symptoms gradually increased until about eleven o'clock on the morning of the 21st, when she expired. She nursed only a few hours before death.

"EXAMINATION TWENTY-FIVE HOURS AFTER DEATH, IN COMPANY WITH DR. HAYWARD. — There was no appearance of ulceration having begun in the skin at any part. The

burnt skin upon the chest was divided in making the incision, and its appearance was not unlike that which is commonly produced by a blister. On opening the chest, the lungs were found to be less collapsed than usual. There were no adhesions on the front part; but on the back part both lungs adhered. There were considerable marks of recent inflammation, both upon the surface of the lungs and in the pleura. These were more considerable in the left lung, particularly on the part towards the pericardium, to which it adhered pretty extensively. This lung was also more engorged with blood than the other. The lungs were in other respects healthy in their appearance. The mucous membranes of the trachea and of the œsophagus were neither of them diseased. The branches of the trachea contained a considerable quantity of frothy mucus. We found no marks of disease in the abdomen."

I have met with some other cases of this kind which have terminated in the same way, and am inclined to believe that the affection of the lungs, the proximate cause of death, is not an effort of nature to relieve the injured surface, as it appeared to be in the cases related by Dr. Cumin. The skin, it is well known, contributes largely to effect that peculiar change in the blood which principally takes place in the lungs; hence there is a connection and sympathy between the cutaneous and pulmonary organs greater than between almost any other two in the economy. When one is embarrassed the functions of the other are increased; and if this embarrassment be not very great, no serious inconvenience is experienced. But when a large portion of the skin is injured by heat, so as to disable it from performing its customary functions, the lungs

will be required to do more than usual; and if the injury be extensive, the consequence must be (at least, so it appears to me) congestion in the first instance, and then inflammation. Upon this supposition, I think, may be explained the fact that the lungs are not affected immediately after the injury, — not, in fact, till the parts are beginning to heal; because it is this very process that suspends the ordinary functions of the cutaneous organ.

Another reason why the difficulty of breathing cannot in these cases be referred, as in those quoted from Dr. Cumin, to an inflammation of the lungs, the result of an effort of nature to counteract the irritation on the surface, is that it does not come on in the early stages, when the irritation is greatest, but rarely appears till it has almost entirely subsided. It may be asked, if this supposition be true, why the same difficulty of the lungs does not occur from deep-seated burns, in which the cutaneous organ is destroyed; the answer to this is, that when the injury is of sufficient extent to produce any effect on the lungs by the destruction of the cutaneous function in the way I have supposed, and at the same time so deep as to destroy the organ itself, the shock given to the system is sufficient to produce either a torpid and insensible state of all the functions, or almost immediate death.

It appears to me, also, that this supposition will account for the intermissions that are often noticed in these pulmonary affections after burns, particularly from the use of warm bathing and frictions on the surface, which contribute, no doubt, to support and increase the functions of the skin; nor do I think that these intermissions can be so satisfactorily explained upon the supposition of the existence of active inflammation.

There is another view of the subject, which, to some, may seem to offer a better elucidation of the difficulty than the one just presented, and that is, the great analogy which there is between the affection of the skin in this class of burns and erysipelatous inflammation. This analogy exists in the *seat*, the *appearance* and the *local treatment*, of the two affections. The *skin*, or *vera cutis*, is the affected organ in both cases, and the formation of vesicles is the result only of the extreme irritation upon it. Diluted alcohol is probably the best local application in erysipelatous inflammation; and there is reason to believe, from some experiments of Sabatier, that it is so in those cases of burns in which the cuticle remains whole. Some of the internal organs are, not unfrequently, suddenly and violently affected in erysipelas; and may not this affection be similar to what takes place in some instances after burns? If this be true, is it not probable that in those cases of superficial but extensive burns in which some of the internal viscera are affected, and in which there is great languor of the circulation and debility and prostration of the whole system, the administration of bark, which has been found so serviceable in erysipelas, might be attended with the best results? But, admitting this analogy to be striking in every particular, does it elucidate the subject at all, and are we not equally at a loss to account for the affection of the internal organs in erysipelas, which is usually attributed to some sympathetic influence, of which we have no distinct idea, and to the very terms of which we attach no distinct meaning? Is there no reason to suppose that if the lungs be affected in this disease in the same manner as in some cases of superficial burns, the cause is the same in both instances?

I have made these suggestions, however, without attaching much importance to them, with the hope merely of calling the attention of others to a subject whose pathology is so obscure, and in which the present mode of treatment is so unsuccessful.

Before concluding these remarks, I will relate a case of considerable interest that occurred in my practice in January, 1821, from which some inferences of importance may be drawn connected with this subject. A child about eight months old was tied into a small chair placed directly before the fire, and left in that situation by its nurse. In struggling, he pitched forward, and brought his head very near the fire. It was uncertain how long he had remained in that situation; his cries alarmed his mother in a distant room. I saw him in a few minutes after the accident; the top of the head, upon which there was considerable hair, *appeared* to be but little injured; but there was a circle extending around it, of at least an inch in breadth, that was most severely burned. For some time I indulged the hope that the portion within this circle had been protected by the hair; before long, however, I discovered that there was a considerable fetid discharge from under the scalp at that place, and that sloughing had commenced, and that the whole of the portion within the burned circle was loose. I was desirous of having it remain as long as possible, if it were only to protect, for a time, the parts beneath. Upon the removal of the dressings, however, a few days after, all this portion of scalp came off with them, leaving the bone beneath entirely bare, for the space of twelve inches in circumference. The parts immediately around healed slowly, and in about six weeks exfoliations began to take place, several of which

were removed from the frontal and two parietal bones; the last not till the April following, more than three months after the accident; and in a few weeks from this the parts entirely cicatrized. Ulceration, however, several times took place, during the summer, over the fontanelles, which healed without much difficulty. It is now nearly three years since the accident; the child has suffered no apparent inconvenience from it, nor did he experience any severe constitutional symptoms during the cure. He is an uncommonly active and intelligent boy.

The circumstances of this case may seem at first view to militate a little with the theory of Dr. Cumin, that a great irritation on the surface induces inflammation of an internal organ; but when it is recollected that the scalp is a part of but little sensibility, it seems probable, even admitting his supposition to be true, that the irritation would not be very great from such an injury; at any rate, not sufficient to produce sympathetic inflammation in other parts of the system.

It will, perhaps, be asked why the destruction of so large a portion of the skin did not produce some affection of the lungs, if the theory which I have ventured to suggest were well founded. I answer, because the scalp performs less of that peculiar office of the skin to which I have adverted than any other part of the cutaneous organ, except it be, perhaps, those portions which cover the palms of the hands and the soles of the feet; and I have no doubt, from what I have seen of such accidents, that death would have been the result of a burn of the same extent, if it had been on the neck, the thorax, or abdomen.

THE MEASLES.

SOME ACCOUNT OF THE MEASLES AS THEY APPEARED IN BOSTON IN THE YEAR 1825.

FROM THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY, JANUARY, 1826.

The Measles prevailed to a greater extent in this city during the last winter and spring than they had been known to for many years before. The first cases occurred as early as the latter part of January, and there were a few remaining ones in the latter part of July; by the first of August the disease had almost entirely disappeared. It attacked persons of all ages; many adults, who had been before exposed to it, and who believed that they were not susceptible of the contagion, became affected by it.

No abatement was discoverable till the early part of June, when it began to yield pretty rapidly; rather, I should think, from the want of subjects than from the approach of hot weather. Though it spread so extensively and continued so long, it was marked by no symptoms of peculiar violence or malignancy; and, on the other hand, it was not of so mild a character as I have seen it. I should not, therefore, have thought it worth while to have made this communication, but for a few circumstances connected with it.

There was a stronger disposition to sloughing in the integuments, on the application of blisters, both during the eruption and after it had subsided, than I had ever before seen. This appeared to be in no way connected with the length of time which the blister was continued on; in the most severe case that came under my notice it remained applied but four hours; when it was removed every particle of the flies was carefully washed off, the surface was dressed with simple cerate; and yet the whole integuments, which had been vesicated, sloughed so as to leave a part of the pectoral muscle on each side exposed to view. The patient, however, did well. The parts were covered at first with a poultice, in which was mixed a large quantity of yeast and powdered charcoal; and as soon as the sloughs began to separate, a dressing with equal parts of powdered bark and charcoal was applied. This was continued till the surface became clean, and then the edges were approximated as much as possible by straps of adhesive-plaster. It was many weeks, however, before the ulcer was perfectly healed.

From the extreme suffering in this, and a few other cases of a similar though less severe character, I should, I confess, feel some hesitancy in resorting to the same means under similar circumstances, though I know not what substitute there can be for vesication, in all cases in which its use may be indicated. It has been suggested that the same effects would not follow the application of a blister which was continued for twenty minutes or half an hour only; but I should apprehend that if it were applied sufficiently long to produce the desired effect on the surface, — that is, vesication, — the danger of sloughing would be equally great as if it were continued the usual period; for

it is obvious that the blister ceases to irritate the integuments the moment the effusion has taken place.

Another circumstance worthy of notice, perhaps, came under my observation. A child of five or six years old had the disease with perfect mildness; the catarrhal symptoms were not severe, and the eruption was not greater or deeper-colored than it usually is in the mild species of measles. The day after the eruption had begun to disappear, and the small scales were falling from the cuticle, the cheeks became suddenly of a purple color, approaching nearly to black. It had precisely the appearance of a deep-colored ecchymosis, and the blood must, I think, have been effused from the capillary vessels. The appearance was singular and novel, and would have alarmed me extremely had it been attended with any unpleasant symptoms; but so far from that being the case, the child appeared to be in other respects perfectly well, without the least fever, and with a good appetite. Under these circumstances I directed merely a light diet, a mild cathartic, and a spirituous application to the parts. The appearance gradually subsided, and in the course of three or four days was entirely gone.

The disposition to pneumonia, after the measles, was greater, I thought, this season, than usual. This might not have been the case throughout the city. I am inclined, however, to think it was. The affection of the lungs was generally obstinate, and in some instances severe; but its mildness or severity appeared to be wholly independent of the character of the previous disease. Some of the worst cases of pneumonia which I saw succeeded measles in the mildest form.

The remedies which were chiefly relied on, in the man-

agement both of the primary and secondary diseases, were emetics, blisters, the warm bath, the inhaling of aqueous vapor, mild expectorants, and *cooling* drinks. Even *cold* water was freely allowed, and I could not discover the slightest inconvenience in a single instance from the use of it; on the contrary, it was preferred by the patients, particularly when some vegetable acid was added to it; and its good effects were frequently very striking. This circumstance is particularly noticed, because a very popular writer, Dr. Good, is of opinion that the drink should be warm which is given during the measles.

The measles, as well as the pneumonia that followed, were certainly much more fatal in former times than they are at present. "Dr. Morton* relates that in the year 1672 this distemper was so terrible, that in London there died of it three hundred every week." The epidemic, that season, however, was of a highly malignant character. Sydenham, in speaking of the pneumonia which so often succeeds the disease, remarks that "this disorder attacks children upon the departure of the measles, and proves so fatal that it may justly be esteemed one of the principal ministers of death, *destroying greater numbers than the small-pox.*"

In a note to page 244 of Dr. Willan's work on cutaneous diseases may be found a statement which will enable us to form some opinion as to the fatality of the measles at a more recent period. After remarking that some had supposed, from reading Sir W. Watson's account of the disease as it appeared in the Foundling Hospital, in London, in 1768, that "there must be something amiss in the state of the air, the diet, or general management of the

* Mead's Works, vol. II.

children," in the institution, he observes that there is no ground for this suspicion. "The regulations remain nearly the same as first framed by the governors; yet their active and intelligent physician, Dr. Stanger, informs me that measles, during the last twelve years, have never appeared in any other form than as described by Sydenham, and, though frequently occurring there, *that they have not been fatal beyond the usual proportion.*" "Thus, in the year 1798, twenty-five boys and forty-four girls had the measles: six of the latter died. In autumn, 1800, twenty-nine boys and thirty-seven girls were affected, and four boys died of the disease or its consequences. In 1794, twenty-eight had the measles, and all recovered. In 1802, one died out of eight children affected." According to this statement, it appears that during the several years named one hundred and seventy-one children had the disease, eleven of whom died, being in the proportion of about one to fifteen and a half; and Dr. Willan informs us that it was not fatal beyond the usual proportion. I have no precise data, to which I can refer, to show the proportion which the number of deaths from measles in this city bears to the number of cases; it is, in fact, impossible to have such data, because so many cases occur for which medical advice is never obtained. But I am confident that for the last ten years the number of deaths from the measles and the pneumonia which follows has not been, in this city, when compared with the number of cases, in the proportion of one to one hundred and seventy-one. Every practitioner among us who has seen much of this disease will concur in the opinion expressed, I believe, by Dr. Jackson, in the *New England Medical Journal* for January, 1817. "It is not easy," says he, "to find an instance of

death from measles, where the patient has had a fair chance for medical assistance; and very few instances occur of death from this disease, even where no regular attention is paid to it."

Are the measles, then, really a more severe disease in Europe than they are in this country; or is the greater fatality which attends them there attributable in any degree to the method of treatment? From the time of Sydenham to the present day, remedies of a much more active character have been employed in Great Britain, in the management of measles and its consequences, than are usually resorted to under similar circumstances in this country. Bleeding has been considered by many of the most enlightened physicians as a remedy of the first importance, not to be reserved for extreme cases only, but to be used in most instances where medical aid is required. They never seemed to doubt the propriety of resorting to it at all; the only question was as to the best time of employing it. Morton recommended it as soon as the eruption was out; Sydenham deferred the use of it till the eruption had disappeared; and Mead thinks it proper at any time, and censures the other two for not employing it more frequently and more freely. Dr. Heberden concurs with Dr. Mead in opinion as to the propriety of bleeding in every stage of the measles.

The measles, being a disease of a specific contagion, governed by peculiar laws, and destined to go through a certain course, may, one would think, be aggravated by any violent means, that should interfere with those laws, or interrupt that course. I, of course, speak of the disease in its simple, mild form; when connected with local inflammation, no doubt active remedies are necessary, and are always resorted to in this country. Dr. Armstrong, how-

ever, and some other English physicians, appear to think that there is danger of interfering too far "with the operations of nature" in this disease; and rely, in ordinary cases, upon regimen and mild means. It is certainly more candid to suppose that the disease has formerly assumed, if it does not at present, a worse character in Great Britain than it does among us; and to this cause mainly must be attributed its greater fatality there. The difference in the number of deaths from measles in that country and this is too great to be attributed to any mode of treatment; nor can we suppose that the British physicians, who are so enlightened upon all other subjects of their profession, should be so much in the dark with regard to this.

It must be admitted, I think, that the diet and regimen have as great an influence on the character of this disease as on that of any other, not excepting small-pox; and upon these very points great diversity of opinion has existed among physicians. In former times the patient was kept hot, usually in bed, the temperature of the room raised to a high degree, and large doses of stimulating medicines were administered with the view of driving out the eruption, and keeping "the disease from the heart." At the period when the change took place in the management of the small-pox, a similar change was adopted with regard to the measles, from a supposed analogy between the diseases. The same good effect, however, did not follow the adoption of the cool regimen for the latter disease, that was experienced from it in the former, though it probably was a better course than the one for which it was substituted. The method which I believe is usually pursued here, and which is similar to the one recommended by Armstrong, is to keep the patient, if possible, in a large,

well-ventilated apartment, at a temperature of about sixty degrees during cold weather, to confine him to a light diet, with cooling drinks, and occasionally to administer a mild cathartic. This practice is usually sufficient in the mild form of the disease; when severer symptoms appear, other remedies are of course made use of, but even these are not of a very powerful character. In the cases of more than two hundred patients that came under my care with the disease the last season, blood-letting was not employed in a single instance, and every individual recovered; and this will not be considered by those physicians who were acquainted with that epidemic to have been very remarkable success. How far the disease this season was rendered mild by the regimen, I leave to others to decide.

December, 1825.

CASE OF HYDROPHOBIA.

THERE are probably some physicians who are still incredulous as to the existence of such a disease as Hydrophobia. Many of them believe that the peculiar affection known by that name is merely a form of tetanus; that the symptoms are owing to the nature of the wound, the character of the parts injured, and the state of the patient's system, and not to the presence of any morbid virus. They know that the bite of an animal often produces a punctured or lacerated wound; and, as the hand is the part that is frequently bitten, a tendon, a fascia or a nervous filament, may be the seat of the injury. There would seem, therefore, to be no good reason why tetanus might not arise in this way, as well as from the puncture of a tendon by a nail, or of a fascia or nerve by a bone, as sometimes occurs in compound fractures.

Besides, there is occasionally a close resemblance in the symptoms of the two diseases. In some cases of tetanus there is a great difficulty of swallowing, and in hydrophobia there is frequently a convulsive and spasmodic action of the muscles, not wholly unlike what occurs in tetanus. It is true, however, that the convulsive action of the muscles in these two forms of disease is not of precisely the

same character, but yet there is often a sufficient resemblance to lead to the belief that it arises in both cases from the same cause.

It is not strange, therefore, that the opinion as to the identity of the two diseases should have prevailed to some extent, especially as the opportunity of seeing cases of hydrophobia is so rare. I must confess that till within a few years I did not believe in the production of any specific disease by the bite of a rabid animal. I thought that some of the cases reported might be those of tetanus; others of delirium tremens; and not a few, perhaps, the result of a high degree of nervous excitement, consequent upon the dread which an individual who had been bitten might very naturally feel as to the consequence. I did not place entire confidence in many of the accounts that were from time to time published of fatal cases arising from the bite of a rabid animal. Without imputing to those who reported these cases the slightest intention to exaggerate or misrepresent, I did not confide entirely in these statements, because they were often made by unprofessional men, who would not be likely to make a very accurate diagnosis. They would, perhaps, overlook symptoms of great importance, and attach an undue value to some of little or no consequence.

And even when the reporters were medical men, the cases were not always given with that accuracy of discrimination which is so desirable, but which, it must be admitted, is often so difficult; or the symptoms may have been so equivocal as to render it almost impossible to decide as to the exact type of the disease. A case of this kind is reported in the first volume of the Medico-Chirurgical Transactions, by the late distinguished Dr. Marcet,

of Guy's Hospital. It occurred in London, in the year 1807. After a careful perusal of this paper, it seemed to me that there was nearly as much evidence that the patient died of delirium tremens as of hydrophobia. At any rate, one could hardly decide as to the cause of death from the published account alone, but must rely in some measure, in forming his opinion, upon that of the medical attendant.

In this case it was not certain that the animal was rabid; the injury was a very slight one, in the forefinger of the left hand; the illness did not occur till more than two months after, and no connection between it and the bite was at first suspected. There was no pain or soreness in the part that had been injured, though there was some lameness in the back of the hand, which extended up the arm to the shoulder.

The patient, on the second day of his illness, went out, drank freely, and became intoxicated; he was irritable, easily agitated, wakeful, and laboring under a partial delirium. He lived in this state six days, having been taken on Monday, the 27th of April, and dying on Sunday, the 3d of May, which is longer than patients usually live who die from hydrophobia.

He swallowed with difficulty; yet he did swallow, and drank fluids of various kinds, to some extent, till within a few hours of his death. In fact, it is stated that he drank a pint in the night but two before he died; and, on the very last night of his life, Dr. Marcet says that "he had drank a good deal during the night, but in the morning refused all kinds of liquids, thinking we had put poison in them." He also says that "he had no sleep at all during the night, and had been at times delirious." Now, I think

that any one who was inclined to doubt the existence of hydrophobia might argue, with some show of reason, that this was a case of delirium tremens, though I am satisfied that the disease was the result of the bite of a rabid animal. It was not a strongly-marked case, and it is not improbable that the scepticism on this subject may have arisen from the fact that the reports of similar cases have been the only ones which have come to the notice of those who have had doubts as to the reality of such a disease.

My doubts on this point, however, were removed, a few years since, by a case which occurred in a neighboring city. I had not an opportunity of seeing it, but the account given by a medical friend, who was an eye-witness, entirely convinced me. Within a few months another case of the kind, of the most painful character, has appeared in our immediate vicinity. This came under my own notice, and would, I am sure, have removed the scepticism of any one who had seen the little patient. I do not, therefore, deem it necessary to make any apology for giving the details of the same at some length.

Case. — An interesting, healthy boy, of seven years of age, was bitten in two places by a dog, on Saturday, the 13th of August, 1853, at Longwood, near Boston. One of the wounds was at the outer angle of the eye, involving a part of the upper eyelid, and the other was near the corner of the mouth on the opposite side; one of them having been made by the teeth of the upper jaw, and the other by those of the lower. Neither of them was severe, and the one in the neighborhood of the mouth was quite superficial. It was not known whether the animal was rabid. The dog was a stranger, and no trace of him was

ever obtained. Inquiries were at once set on foot, and all that was learned was, that another dog in the neighborhood, who was bitten about this time by an unknown dog, showed such unequivocal signs of madness soon after, that his owner shot him.

The family, however, sent for a physician as soon after the accident as possible, and Dr. Edward A. Wild, of Brookline, saw the child in about an hour from the time of the injury. He adopted the most prompt and judicious means to prevent the absorption of the virus, if any had been deposited in the wounds. From the situation of the injured parts, it would have been impossible to have removed them entirely by the knife, or at least it could not have been done without cutting off a large part of the upper eyelid. He therefore resorted to suction; and, entirely regardless of the danger to which he might be exposed in doing so, he applied his lips to the wounds, and continued to suck them for nearly or quite two hours. He then cauterized them thoroughly, for a length of time, with the nitrate of silver, which is esteemed by Mr. Youatt and some other writers on the subject as the best caustic in cases of this kind.

On the following day the child was brought to my house. He seemed to be perfectly well, and suffered only from soreness arising from the application that had been made to the wounds. He continued in apparently good health for a month. The only thing observable during this period was that he was more sensitive to cold than formerly; but this was regarded as accidental, and not thought of in connection with his injury.

On the night of Monday, September 12th, he was restless, and slept but little. He complained of some uneasi-

ness in his stomach, and the family attributed the trouble to a slight derangement of the bowels. In the morning of Tuesday, the 13th, he had no appetite, and declined taking breakfast. Shortly after, he said he was thirsty, and wanted water. As soon as it was brought towards him, he became agitated; when it was carried nearer, he was slightly convulsed; and, as it approached his lips, he cried out in great apparent terror.

He also complained at that time — and he had done so during the night — of pain in the eye near which he was bitten; but there was neither redness, swelling nor tenderness, about the cicatrix.

These symptoms led his friends to suspect for the first time the nature of the disease, and Dr. Wild, Sen., the father of the gentleman who saw the child directly after the injury, visited him on Tuesday evening. He administered a powder, probably the extract of belladonna, but it is very doubtful whether he was able to swallow any of it. At any rate, his attendants are confident that he never swallowed afterwards.

During that day he was restless, uneasy, moving about the room with his head inclined to one side; very sensitive to currents of cold air; quite irritable, disturbed if several persons were in the room, even if they did not speak to him, and complaining of great thirst, at the same time conscious of his inability to swallow. His skin was hot and dry; his pulse rapid; his respiration hurried, and his mouth filled with frothy saliva.

He continued very much in this condition through the night, during which he slept but little, and in the morning all his symptoms had assumed a still graver form.

I was requested to visit him in the course of the day, in

company with Dr. J. Mason Warren; and I did so at six o'clock in the afternoon. Dr. Wild had an engagement that prevented him from meeting us. Dr. Francis, who had seen him with Dr. Wild, was there, but declined going into the chamber with us, as he thought the presence of a number of persons would produce a very painful degree of excitement in the little patient.

When we entered the room we found him dressed, walking about in a rapid, impatient manner, with a wild expression of countenance, and an inclination of his head to one side. He seemed to be somewhat disturbed by our visit. When spoken to, however, he answered with perfect readiness, and rationally. He evidently preferred being in motion, and it was some time before he could be induced to sit down. When asked what was his trouble, he put his hand to his throat, and said that he could not swallow. His utterance was very rapid, and yet his sentences were broken, apparently from his hurried respiration. There seemed to be almost a pause between every two words, giving such a peculiarity to his speaking that I could readily understand the origin of the popular notion that patients with hydrophobia sometimes bark like a dog. This peculiar mode of utterance is, no doubt, owing to the extreme rapidity with which the patients breathe. They are very careful to avoid taking a full inspiration, as it is almost uniformly followed by a violent convulsive action of the most painful character.

As he said he was thirsty, I asked for a tumbler of water. An attendant poured some from a pitcher into a glass. While this was doing, the little patient seemed slightly agitated. I took the vessel in my hand, and offered it to him. He evidently wished to take it; but

when I carried it towards him he trembled and drew back; and when it was brought near his lips he was strongly convulsed, and cried out in a very distressing manner.

I then, unobserved by him, put some water in a cup and offered it to him. He took the cup in his hand and seemed determined to drink. But as it approached his mouth the same convulsive action and painful cries ensued, and the attempt was abandoned.

Dr. Warren then gave him a piece of soft bread, which he seized with eagerness, and forced into his mouth. In a few seconds, however, he spat it out, and said he could not swallow it.

Another piece, having been moistened with water, was then offered to him in a spoon. He took this in his mouth, but it was rejected in the same way precisely as the other, and about as soon. We were now satisfied that he could not swallow; for he made great efforts to do it, and showed a wonderful degree of resolution and firmness for a child of his age. We therefore did not trouble him any more in this way.

It was raining violently at the time of our visit. I led him to the window; but the sound of the rain did not disturb him, though there was no doubt that he heard it. The same thing, however, has been noticed in other cases, even when the window has been open.

We examined his throat as well as we could with the imperfect light we had. There seemed to be a slight degree of redness about the fauces, and the mouth was filled with frothy saliva.

The pulse was one hundred and twenty, and rather small and feeble; and, as nearly as could be ascertained,

there were more than forty inspirations in a minute. The skin was dry, and of a temperature somewhat above the natural standard.

We directed two leeches to be applied to the base of the skull; and an enema of a gill of starch with a scruple of asafœtida to be thrown into the bowels every two hours, till all their fecal contents were discharged. After this had taken place, nutritive enemata of milk and arrow-root were to be given for nourishment.

I did not see him again, but was told by those who were with him that there was no improvement of any kind after our visit; on the contrary, his symptoms grew gradually worse, and he passed a restless and uneasy night.

On the following day (Thursday), a partial hemiplegia took place; his articulation became more indistinct, and by noon it was impossible to understand him. As long as he could make himself understood, he seemed to be in possession of his reason. His convulsions were not more violent, and his sufferings were apparently not increased. His symptoms indicated an effusion on the brain some hours before death, and he died between eleven and twelve o'clock at night.

That this was a case of hydrophobia, I have no doubt; and it is the first that I have ever seen. It differs from tetanus in many respects. I speak with some degree of confidence on this point, as eleven fatal cases of that disease have come under my observation, and in more than one of these I was present when death took place.

The extent of the wounds and the nature of the injured parts were not such as would be likely to produce tetanic symptoms. The time between the injury and the appear-

ance of the disease was much longer than what usually occurs in traumatic tetanus. The earliest period at which hydrophobia has been known to appear after the bite of a rabid animal is fifteen days, and the average period is from four to seven weeks; while Prof. Romberg says that "in the majority of cases traumatic tetanus occurs during the first four days after injury; Dr. Friedrichs found this to be the case in eighty-three out of one hundred and twenty-eight fatal cases."

The duration of the two diseases, when in an acute form, is about the same, averaging from two to four days.

The essential difference between them, however, seems to be, that the symptoms of one — tetanus — arise principally, if not entirely, from an affection of the spinal cord; while those of hydrophobia are owing, in great measure, to a morbid condition of the medulla oblongata, the spinal nerves being at the same time affected to a greater or less extent. This view of the subject accounts satisfactorily for the difference in the symptoms of the two diseases. The one is purely an affection of the spinal system of nerves, while in the other those of the brain are to a greater or less extent involved. Baron Larrey says that in tetanus "the functions of the brain remain unaffected until the last moment of life; so that the unfortunate patient who is attacked with this disorder is conscious he is dying."

In hydrophobia, on the other hand, "it is undeniable," says Prof. Romberg, "that the mind is excited, and it manifests itself by the loud and violent manner in which the patient speaks." In adults, especially, the mental affection is often very severe, and goes on, in some in-

stances, to complete mania. This is less frequent in cases of females, and still more rare in those of children. But in all the functions of the mind are disturbed to some extent, varying in degree in different cases.

In tetanus, the presence of fluids, their contact, or the noise made by them, does not produce any spasmodic action of the muscles, or in any way disturb the patient. In some of the cases which I have seen there has been no inability of swallowing to the very last moment of life. When it does occur, it is owing, no doubt, to the spasmodic action of the muscles of deglutition, that derive their nerves from the spinal cord.

In hydrophobia, on the other hand, there is extreme thirst, and an almost total inability to swallow, from the very onset of the disease. The strongest effort of the will frequently cannot accomplish it. The mere sight of fluids in motion, or the sound caused by their agitation, usually excites violent convulsive action in the patient, if they are in the same apartment with him.

Death in tetanus arises, in most cases, from asphyxia; the muscles of respiration cease to act, and the lungs, of course, are no longer supplied with air.

In hydrophobia it "ensues from apoplexy or asphyxia, during a violent paroxysm of convulsion, or, it may be, from extreme exhaustion."

The difference in the mode of death in the two diseases points pretty clearly to the part of the nervous system from which they originate. The affection of the medulla oblongata in hydrophobia satisfactorily explains why life should be terminated by compression of the brain in that disease; and asphyxia would be a natural consequence of a spasmodic action of the respiratory muscles, that derive

their nerves from the spinal cord. Effusion on the brain, and consequent compression and apoplexy, are not seen in tetanus; and death from asphyxia in hydrophobia may be regarded almost as accidental, rarely occurring in the more acute form of the disease, but only in those cases in which the symptoms of tetanus are superadded.

Post-mortem examinations of the bodies of those who have died of hydrophobia and tetanus have not, so far as I can ascertain, been very numerous. The most common morbid appearances that have been discovered in the fatal cases from hydrophobia are congestion, and sometimes inflammation in the brain and spinal cord, with serous effusion; while in those from tetanus no anatomical change has been detected in the brain, but there has usually been congestion, and sometimes softening of the spinal cord, with an increased quantity of serum.

Since writing the foregoing, I have seen another fatal case of tetanus. A gentleman, fifty-eight years of age, fell on Monday evening, Dec. 5th, 1853, while walking in the street. His principal injury from the fall was a severe compound dislocation of one of his thumbs. Amputation was advised, but he was unwilling to submit to the operation.

In thirty-six hours after the accident, signs of mortification appeared.

On the morning of Sunday, the 11th, while at breakfast, "he spoke of a slight sensation of stiffness about the neck;" and Dr. Gordon, who visited him at half-past four P. M., found that "the rigidity of the muscles of the lower jaw was considerable at that time."

I saw him on the following day,— Monday, the 12th,—

in consultation with Dr. Gordon, at eleven o'clock A. M. We found him in bed; without pain; pulse and respiration as in health; the skin of the ordinary temperature, and his mind rational and calm. In fact, on a superficial examination, he appeared to be well.

He said, however, that the muscles of the lower jaw were very stiff, so that he could with difficulty open his mouth; that any attempt to swallow was followed by a violent spasm, that rendered the jaw almost immovable; that when his head was not supported and rather inclined forward, there was a strong tendency to draw it back, which was very distressing, and which he had not the power to resist.

He proposed getting out of bed, as he thought we could examine him better. He did so; and when he attempted to sit down his head was drawn forcibly backwards. A pillow was placed behind it, but a second violent contraction of the muscles took place. He then asked for another pillow.

He could swallow at this time, and did so at my request, but the effort to accomplish it brought on powerful spasms. He died that evening, at ten o'clock, evidently from asphyxia.

In a note, which I received a few days after, from Dr. Gordon, and from which I have extracted above one or two sentences, it is stated that he retained "his senses perfectly to the last, and that he had, from two o'clock P. M., repeated very violent spasms of the whole body."

This case, and that of hydrophobia given above, seem to me to derive additional interest when viewed in connection with each other. They exhibit, most strikingly,

the peculiar symptoms of these formidable and distressing maladies, tetanus and hydrophobia, over which, unfortunately, human skill has but little control.

Boston, *Jan.* 12, 1854.

PARURIA INOPS.

SOME ACCOUNT OF A CASE OF PARURIA INOPS (GOOD), OR PARALYSIS OF THE KIDNEYS.

FROM THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES.

This disease, in which, according to Dr. Good, the "urine is unsecreted by the kidneys," and there is "no desire to make water, nor sense of fulness in any part of the urinary track," is of very rare occurrence. No writer but Sir Henry Halford, that I am aware of, has published any account of it. This circumstance, together with the fact that its termination is usually, if not always, in death, induces me to submit the following details of a case that recently occurred in my own practice.

On Thursday, July 16th, 1829, at one o'clock P. M., I visited a lady in the fiftieth year of her age, the mother of several children, and found her complaining of nausea, with diarrhœa, and slight pain in the stomach and bowels. She had been as well as usual till Tuesday evening, but since that time had been so much indisposed as to abstain from all food. Her indisposition she attributed to taking cold, from exposure on Monday night. She had formerly been a good deal of an invalid, having suffered severely from repeated miscarriages, but had for the last eight or ten years enjoyed a very tolerable share of health.

Her tongue was covered with an unusually thick coat, her pulse between seventy and seventy-five in a minute, moderately strong, and her skin cooler than in health. I directed a gentle emetic of the wine and powder of ipecacuanha, to be followed by castor-oil, and the dejections to be restrained by opium, if they were excessive.

On Friday morning I learnt that the emetic had operated thoroughly, but mildly, and that she brought from her stomach food in an undigested state, that was taken on Tuesday. Her bowels had been so frequently moved as to render it necessary to give her three grains of opium at intervals. She was somewhat stupid, which at the time was attributed to the opium; the coat on the tongue remained about the same. She still complained of nausea, though she was free from pain; the pulse was slower than on the preceding day, and the temperature of the skin was diminished. At this visit, she told me that she had passed no water since early on Wednesday morning, but that she had no desire to do so, and no pain or inconvenience from it. On passing my hand over the bladder, I satisfied myself that it was not distended; I directed her to take one drachm of a mixture of three parts of the liquid acetate of ammonia, and one part of the spirit of nitrous ether, every two hours, and to let me know in the afternoon if she had not evacuated the bladder in the interval. I was sent for in the afternoon, as no water had been passed; there was still no suffering, and the bladder was not distended. I then introduced the catheter, and drew off about half an ounce of urine of a very healthy character. The patient was more drowsy at this visit than I had seen her at any previous one, and being now convinced that the whole trouble arose from a want of secretion of

urine, I stated to her family that I considered her situation an alarming one, and that the disease would probably have a fatal termination. This surprised them, as her strength was good, she was without pain, and conversed freely when roused from the stupor to which she was inclined.

I now directed a large blister to be applied over the kidneys, fomentations of hot herbs in spirit above the pubis, sinapisms to the feet, and stimulating frictions to the whole surface of the body, with a continuance of the diuretic mixture.

On Saturday morning all her symptoms were aggravated; the pulse slower, the skin colder, and the coma increased. The tongue remained coated, there was no appetite for food, and no water had been passed. A powder, composed of one grain of the sub-muriate of mercury, five grains of the nitrate of potash, and a scruple of cream of tartar, was ordered to be given every two hours; and the medicine that had been before directed was to be taken in the intermediate hours, and the other remedies were continued. No improvement took place during the day; on the contrary, the coma increased, the pulse became slower and more feeble, and the temperature of the skin was diminished.

Finding all her symptoms worse on Sunday morning, I directed ten drops of the tincture of cantharides and capsicum to be given every two hours, instead of the mixture of the spirits of nitre and Mindererus, and the other remedies to be continued. At this visit I passed the catheter, and drew off about an ounce of healthy urine. At three o'clock P. M. Dr. Warren saw her with me; she was now so comatose that it was impossible to rouse

her, and her pulse had sunk very considerably since morning.

Dr. Warren advised to give one drachm of the tincture of cantharides and capsicum every two hours, to rub along the whole course of the spine with the same, and to continue the use of the other means. The medicine was given and the other directions followed till eight o'clock in the evening, when she became unable to swallow, her pulse ceased at the wrist, the surface of the body became cold, and the breathing stertorous and at long intervals; and in this state she continued till Monday evening, at seven o'clock, when she died.

SECTIO CADAVERIS, TWENTY-THREE HOURS AFTER DEATH. —The examination was made in presence of my friend Dr. Homans, of this city.

The general appearance of the body was natural. On dividing the scalp from ear to ear, and dissecting it from the cranium, no fulness was discovered in the vessels of the integuments, and scarcely any blood was effused. The brain and its membranes were found to be in a perfectly healthy state, there was neither effusion nor congestion, but all the appearances warranted the conclusion that the morbid symptoms were owing to the quality of the blood, rather than to its quantity.

There was no mark of disease in the stomach, intestines, liver, spleen, or uterus. The kidney of the right side was about half the usual size, and a third part of it, at least, was of a deep purple color, exhibiting traces of considerable inflammation, apparently recent. When cut into it emitted a strong urinous odor.

The left kidney was not larger than a small English walnut, but of a healthy appearance, and free from any

urinous odor. Both the ureters were somewhat inflamed. The bladder did not contain a drop of urine; the mucous coat was nearly black, appearing to have been the seat of violent inflammation. Whether this was the case, or whether the inflammatory appearance about the ureters and bladder was to be attributed to the absence of urine, the usual stimulus of the parts, is a point which I feel unable to decide.

As this disease so rarely occurs, and as all the cases that have come to my knowledge have terminated fatally, I shall be excused, perhaps, for adding a few remarks. The only printed account of this singular affection which I can find is the one by Sir Henry Halford, referred to in the beginning of this paper. It was published in 1820, in the sixth volume of the Transactions of the College of Physicians, in London. It appears that he had never seen but five cases. They differed in some respects from the one above detailed. "All the patients were fat, corpulent men, between fifty and sixty years of age." "In three of them there was observed a remarkably strong urinous smell in the perspiration twenty-four hours before death." Nothing of this kind was discoverable in my patient.

In Sir H. Halford's patients no urine whatever was secreted; and he remarks, that "If any water, however small the quantity, had been made in these cases, I should have thought it possible that the patients might have recovered; for it has often surprised me to observe how small has been the measure of that excrementitious fluid which the frame has sometimes thrown off, and yet preserved itself harmless; but the cessation of the excretion altogether is universally a fatal symptom in my experience, being followed by oppression on the brain."

From my patient it will be recollected that a small quantity of water was drawn off on Friday afternoon, and again on Sunday morning, showing that some secretion had taken place; which proves that the conjecture in the above quotation, as to the favorable termination of this disease under such circumstances, is unfortunately not to be much relied on.

The disease he denominates paralysis of the kidneys, and till something more is known of it this name will answer, perhaps, as well as any other; though, if it were fair to draw any conclusion from a single instance, it might be inferred, from the appearances in my case, that the paralysis was consequent on an organic affection. It does not appear that he made any examinations after death, nor has he detailed his method of treatment. Whether this affection is under the control of any remedies we possess, remains to be proved; but hitherto all attempts to check it have been unavailing.

The slow and feeble pulse of my patient, the temperature of her skin, which was below the ordinary standard, and the entire absence of pain, seemed to forbid all depletion, but indicated the administration of stimulants, such especially as would act on the urinary organs. But I must confess that nothing that was administered appeared to have the slightest effect in relieving the patient; and if another case should fall under my care, though I know not what different treatment I could pursue, yet I should feel but little encouragement in adopting my former plan.

Death in these cases is no doubt owing to the impure state of the blood, arising from the failure of the kidneys to perform their usual secretion. The circulating fluid,

when it is first received from the lacteals, is in a state wholly unfit to support the vital functions. It is an important part of the office of the lungs, skin and kidneys, to purify it; and if the customary action of these organs be partially interrupted, alarming consequences ensue, and a complete suspension of their functions produces death. This is well known with regard to the lungs. The immersion of the body into carbonic acid gas is followed by an immediate suspension of vitality, and unless the lungs are soon supplied with respirable air death is the consequence. The cause of this is, that the pulmonary organs, when deprived of vital air, are unable to effect that peculiar change in the blood which should take place in them; the blood is then sent to the left side of the heart in a state unfit for the purposes of life.

A similar effect, though less sudden, would be produced if there should be a total suspension of the action of the skin; and a failure on the part of the kidneys to perform the office assigned to them is followed by like consequences. There is a great similarity in the morbid effects arising from these different causes, because the brain is in each case the organ primarily affected. To enable it to perform its functions well, it must be regularly supplied with what is called arterial blood; that is, blood that has been freed of its excrementitious part. But when impure blood is sent to it, it instantly ceases to act if the impurity be great, and immediate death is the consequence. If the noxious principles have been in part removed by the lungs, skin and kidneys, the effects are not so sudden or violent; coma, however, usually comes on, which gradually increases, if the cause continue, till it terminates in death. When the kidneys, therefore, fail to secrete urine, and

thus rid the blood of a part of the excrementitious matter which it contains, the functions of the brain are soon disturbed, and death ensues, unless, as sometimes happens, another organ performs a vicarious office for them.

August 8, 1829.

STATISTICS

OF PULMONARY CONSUMPTION IN THE CITIES OF BOSTON, NEW YORK, AND PHILADELPHIA, FOR THIRTY YEARS; WITH REMARKS.

It is undoubtedly true that more persons die of pulmonary consumption than of any other disease. It prevails to a greater extent in some countries than in others, being far more frequent in temperate regions than in those in a very high, and, perhaps, it may be added, or low latitude. "It has been calculated," says Sir James Clark, "by the late Dr. Young, Dr. Woolcombe, and others, from the best data which the bills of mortality afford, that in Great Britain and Ireland consumption causes one fourth part of the deaths that occur from disease."

It is not, however, so prevalent, probably, in the United States as in some parts of Europe, though we have not the means of making any exact calculation upon a large scale. But we have a right to infer this from the fact that the proportion of deaths from consumption to the whole number is not so great in Philadelphia, New York and Boston, as it is in Great Britain and Ireland; and it can hardly be doubted that it abounds more in these cities than in the country generally.

It is well ascertained that this formidable disease was

on the increase in Great Britain from the beginning to the middle of the last century, and that it remained stationary from that time to the year 1837, the period when the calculation was made. This increase was greatest among the middling and upper classes of society; in fact, the lower classes, it was thought, did not suffer more from it than formerly; which was, perhaps, to be attributed to an improvement in their mode of living. This increase is the more remarkable, as the mortality from other diseases has lessened in a striking degree in the same period of time. In the year 1700 the number of yearly deaths in every one thousand inhabitants in the city of London, from all diseases, was thirty-one, and only four of these were from consumption; while in 1821 the number from all diseases was only nineteen in a thousand, and six and one fifth of these were from consumption. From that period to the year 1837 the proportion of deaths from these two sources remained the same.

It is very desirable to ascertain, if possible, if a similar state of things exists in our own country; but unfortunately we have not the means of deciding this with perfect accuracy. Bills of mortality are not universally kept in the United States; and in those places in which they are they cannot always be relied on with entire confidence. An approximation to the truth, therefore, is all that can be made; and, with this view, I have examined with some degree of care the bills of mortality of the cities of Boston, New York, and Philadelphia, for thirty years, from 1811 to 1840, inclusive. In the following tables will be found the whole number of deaths for each year from every cause, and also the number from consumption during this period in these cities.

Statement of Deaths in the City of Boston for Thirty Years.

Year.	Whole number of deaths.	From consumption.
1811	742	221
1812	677	190
1813	786	193
1814	727	153
1815	854	190
1816	904	180
1817	907	231
1818	971	138
1819	1070	175
1820	1103	220
Total for 10 years,	8741	From consumption, 1891
1821	1420	208
1822	1203	166
1823	1154	184
1824	1297	246
1825	1450	220
1826	1254	231
1827	1022	178
1828	1233	217
1829	1221	203
1830	1125	193
Total for 10 years,	12379	From consumption, 2046
1831	1424	203
1832	1761	246
1833	1475	240
1834	1554	246
1835	1914	208
1836	1770	233
1837	1843	212
1838	1920	256
1839	1863	222
1840	1972	240
Total for 10 years,	17496	From consumption, 2306

Statement of Deaths in the City of New York for Thirty Years.

Year.	Whole number of deaths.		From consumption.
1811	2524		595
1812	2553		669
1813	2299		562
1814	1974		572
1815	2507		618
1816	2739		678
1817	2527		574
1818	3265		591
1819	3176		577
1820	3516		625
Total for 10 years,	27080	From consumption,	6061
1821	3542		715
1822	3241		624
1823	3444		683
1824	4341		736
1825	5018		843
1826	4973		820
1827	5181		829
1828	5181		906
1829	5094		880
1830	5537		974
Total for 10 years,	45552	From consumption,	8010
1831	6363		1033
1832	10359		1415
1833	5746		1251
1834	9082		1471
1835	7082		1437
1836	8009		1514
1837	8732		1458
1838	8053		1225
1839	7953		1315
1840	8474		1296
Total for 10 years,	79853	From consumption,	13415

Statement of Deaths in the City of Philadelphia for Thirty Years.

Year.	Whole number of deaths.		From consumption.
1811	2249		369
1812	2017		339
1813	2223		216
1814	2041		274
1815	1943		347
1816	2225		434
1817	2107		349
1818	2609		396
1819	2979		459
1820	3189		446
Total for 10 years,	23582	From consumption,	3629
1821	2161		438
1822	3334		488
1823	4372		536
1824	4284		576
1825	3539		519
1826	3845		587
1827	3659		523
1828	3971		581
1829	4001		638
1830	3948		636
Total for 10 years,	37114	From consumption,	5522
1831	4939		673
1832	6699		681
1833	4440		650
1834	5073		636
1835	5666		717
1836	5357		755
1837	5202		748
1838	5462		725
1839	5113		708
1840	4949		777
Total for 10 years,	52900	From consumption,	7070

The most striking fact brought to light by these tables is the great decrease of deaths by consumption in these cities. This decrease has been great in all, but greater in Boston than in either of the others; and this is not only a relative but an absolute decrease, for the mortality has been somewhat more during the last ten years than it was thirty years ago. At that time the deaths were about twenty-two to every thousand inhabitants; and now they are nearly, if not quite, twenty-three to one thousand. It will be seen, by these tables, that in Boston during the first ten years the whole number of deaths was

		By consumption.	
	8741	1891	being 1 in 4.622
Whole No. 2d 10 years,	12379	2046	" 1 in 6.050
" 3d "	17496	2306	" 1 in 7.587
" for 30 years,	38616	6243	; which is equal

to 1 death by consumption in 6.185 of the whole number.

In New York,		By consumption.	
Whole No. 1st 10 years,	27080	6061	being 1 in 4.467
" 2d "	45552	8010	" 1 in 5.686
" 3d "	79853	13415	" 1 in 5.952
" for 30 years,	152480	27486	" 1 in 5.547

In Philadelphia,		By consumption.	
Whole No. 1st 10 years,	23582	3629	being 1 in 6.498
" 2d "	37114	5522	" 1 in 6.721
" 3d "	52900	7070	" 1 in 7.482
" for 30 years,	113596	16221	" 1 in 7.003

Thus it appears that during the whole period embraced in these tables Philadelphia has suffered less from consumption than either of the other cities; the average number of deaths from that disease for the whole time

being as 1 in 7.003 of the whole number; while in Boston they were as 1 in 6.185; and in New York as 1 in 5.547. But during the last ten years Boston has enjoyed the greatest exemption. From 1831 to 1840 inclusive, the deaths in Boston from consumption were only 1 in 7.587, in Philadelphia 1 in 7.482, and in New York 1 in 5.952.

It is supposed by some persons that there has not been an actual decrease of consumption during the last thirty years, or, at any rate, not so great an one as at first view there may seem to have been; and they explain the fact that a less number of deaths is reported from this disease from an improvement in diagnosis which has taken place, by means of which the precise nature of the malady which causes death is more accurately ascertained. But if this were true, it would not explain the comparative improvement that has occurred in Boston in regard to consumption; for it cannot be pretended that the physical signs by means of which we are guided in determining the nature of some diseases, especially those of the chest, are not as well understood by the physicians of New York and Philadelphia as by those of this city. Besides, there has been no diminution of deaths from this disease in London for the last fifty years, and no one can question the skill in diagnosis of the medical men of the British metropolis.

I believe, however, on the contrary, so far as Boston is concerned, — for I have not examined sufficiently with this view the tables of the other cities to speak with confidence, — that this improvement in diagnosis has had an opposite effect. Many cases which terminate fatally and are now known to be consumption were formerly not well understood, and were included among the deaths from "Unknown Diseases," "Decay of Nature," "Debility," "Indigestion,"

etc. On the other hand, it cannot be denied that some few probably occur, which would formerly have been reported as consumption, that are now ascertained to be some other affection; but these, I am satisfied, do not balance the other class of which I have just spoken.

It is well known that the practice of examining the chest by means of auscultation and percussion was not general, and the use of the physical signs as a means of detecting disease was not employed to any extent in this country, before the year 1830; yet the decrease of consumption began before that time.

It will be seen, by examining the bills of mortality of the city of Boston, that there has been a very striking and uniform improvement as to pulmonary consumption since the year 1811. By the United States census of 1810, Boston contained 33,250 inhabitants; in 1820, 43,298; in 1830, 61,392; and in 1840, 93,452. In 1811, when the population had not probably increased at all from the preceding year, as it was a period of great depression in commercial affairs, the whole number of deaths was seven hundred and forty-two, of which two hundred and twenty-one were of consumption; while in 1840, with a population nearly three times as great, and with nearly three times as many deaths, there were only nineteen more fatal cases of consumption, the whole number being but two hundred and forty; not quite one in eight of all the deaths, and not three in a thousand inhabitants.

Another reason, and one to which I have already alluded, against the opinion that the decrease of deaths from consumption in the bills of mortality of Boston is owing to the improvement in diagnosis, is the fact that since this improvement has taken place there is a great falling off

in the deaths from "unknown diseases;" many cases in former years that were included under this head are probably now classed under that of consumption, as their precise nature is more accurately ascertained. From 1821 to 1830, inclusive, the whole number of deaths was 12,379, and of these 1917 were from unknown diseases; while from 1831 to 1840, inclusive, the whole number was 17,496, and from unknown diseases only 1337; that is, that with an increase of nearly one third in the number of deaths, there was a decrease of nearly one third from unknown diseases.

It must be evident, then, I think, to any one who will examine the subject, that it is impossible to explain the great diminution in the number of deaths by consumption, as reported in the bills of mortality of the city of Boston, without admitting that there is an actual decrease of that disease. To what this decrease may be owing, it is not, perhaps, easy to determine. It is probably, however, to be referred to a combination of causes, rather than to any single one. These, I should say, were mainly the great improvements that have taken place in living during the last thirty years; to the increased comforts of life which are now enjoyed by every class of the community. People are better fed, better clothed, live in more comfortable houses, indulge less in excesses of all kinds, and pay more attention to personal cleanliness, than they formerly did. They adopt better and more effectual means to protect themselves from the vicissitudes of temperature; and the low rate at which cotton fabrics can be obtained, and the consequent general use of them, have, no doubt, contributed essentially to this desirable result.

It is well known that a cold, moist and variable climate

acts not only as a predisposing, but as an exciting cause, also, of consumption; and unless the system is protected by proper food and suitable clothing by day and by night, many of the inhabitants of such a climate will fall victims to pulmonary disease. There is no greater error, I believe, than to suppose that the body can be hardened by exposure to the atmospheric changes without suitable precaution. It would be as reasonable to imagine that it could acquire the power of resisting any degree of heat, or any of the powerful chemical agents, as that it could without proper protection withstand the influence of the elements.

Our only hope of lessening the mortality from consumption is by using all possible means of prevention; for it is not pretended, by those whose opinion is of any value, that this disease, in a confirmed state, is within the control of remedies. It behooves us, then, to ascertain, if we can, what these means are, and to use them with diligence.

Boston, *October*, 1842.

Statement of Deaths in the City of Boston from 1841 *to* 1850, *inclusive.*

Year.	Whole number of deaths.	From consumption.
1841	1919	256
1842	2426	307
1843	2197	249
1844	2241	305
1845	2585	426
1846	3086	485
1847	3853	544
1848	3664	579
1849	5079	644
1850	3667	586
Total for 10 years,	30,717	From consumption, 4381; being 1 in 7.011.

Statement of Deaths in the City of New York from 1841 *to* 1850, *inclusive.*

Year.	Whole number of deaths.	From consumption.
1841	9115	1470
1842	9176	1339
1843	8693	1508
1844	8875	1428
1845	10983	1659
1846	11318	1698
1847	15788	1920
1848	15919	1869
1849	23723	2086
1850	16978	1922

Total for 10 years, 130568 From consumption, 16899; being 1 in 7.730.

Statement of Deaths in the City of Philadelphia from 1841 *to* 1850, *inclusive.*

Year.	Whole number of deaths.	From consumption.
1841	5833	809
1842	5942	774
1843	5526	743
1844	5521	799
1845	6242	834
1846	6347	828
1847	7278	876
1848	7725	965
1849	9462	939
1850	8509	896

Total for 10 years, 68386 From consumption, 8463 ; being 1 in 8.080.

If now we take the whole period of forty years, from 1810 to 1850, we shall find that

In Boston,		By consumption.	
Whole No. 1st 10 years,	8741	1891	being 1 in 4.622
" 2d "	12379	2046	" 1 in 6.050
" 3d "	17496	2306	" 1 in 7.585
" 4th "	30717	4381	" 1 in 7.011
" for 40 years,	69333	10624	; which is equal

to 1 death by consumption in 6.422 of the whole number.

In New York,		By consumption.	
Whole No. 1st 10 years,	27080	6061	being 1 in 4.467
" 2d "	45552	8010	" 1 in 5.686
" 3d "	79853	13415	" 1 in 5.952
" 4th "	130568	16899	" 1 in 7.730
" for 40 years,	283053	44385	; which is equal

to 1 death by consumption in 6.377 of the whole number.

In Philadelphia,		By consumption.	
Whole No. 1st 10 years,	23582	3629	being 1 in 6.498
" 2d "	37114	5522	" 1 in 6.721
" 3d "	52900	7070	" 1 in 7.482
" 4th "	68386	8463	" 1 in 8.080
" for 40 years,	181982	24684	; which is equal

to 1 death by consumption in 7.331 of the whole number.

Thus it will be seen from these tables, compiled anew, with the addition of those of the ten years which have elapsed since the original article was published, that the conclusions then arrived at still in the main hold true. The only exception is that consumption has somewhat increased in Boston during the last ten years; and that, for this period, this city has been surpassed by Philadelphia in its exemption from that disease. It will be remembered that, for the previous ten years, Boston had the advantage in this respect; and it may be, even now, that the diseases

peculiar to more southern climates may have swelled the amount of the whole number of deaths, giving the appearance of an advantage where little, if any, exists in reality.

March, 1855.

LEGALIZING ANATOMY.

Massachusetts is the only State in the Union that has legalized the study of anatomy. She has enacted a law by which the municipal authorities are directed to furnish subjects for dissection to regularly-educated physicians, under proper restrictions; and its provisions are so judicious that no opposition has ever been made to its execution. The supply has not been, perhaps, as great as could be wished, but with the increase of population and pauperism this objection will pass away.

This measure, so creditable to the intelligence of the commonwealth, and so important for the cause of science, was the result, principally, of the enlightened and judicious course of the Fellows of the Massachusetts Medical Society. They first suggested the passage of such a law; and, though public sentiment was strongly opposed to it in the beginning, by their zeal, judgment and good sense, they procured its enactment. Its provisions are not unlike those suggested in the annexed article, which was written in aid of this desirable object. It was published in the *North American Review* for January, 1831, and is now reprinted principally for its value as an historical document.

March, 1855.

Address to the Community on the Necessity of Legalizing the Study of Anatomy. By order of the Massachusetts Medical Society. Boston: Perkins & Marvin. 1829.

The age in which we live is preëminently distinguished by its zeal for the advancement of human knowledge. Every day furnishes new proof of this, in the publications that are sent forth, and the facilities that are devised to promote this great object. Our own country partakes deeply of this spirit, and everywhere throughout our extended regions vast efforts are making to diffuse the means of education and improvement among all classes of society.

We had hoped that, with the general advance of knowledge, more liberal views would have prevailed in relation to the science of Anatomy; that this study would no longer be proscribed, nor its students compelled to pursue it in defiance of the law of the land. It is hardly credible that in our own commonwealth, which has certainly ever taken a deep interest in the cause of good learning, it should have been thought necessary to endeavor to prevent the practice of dissection. Yet it is true that within a few years our legislators have passed an act, which inflicts a severe punishment, not only on those who violate the sepulchres of the dead, but also on those in whose possession any body which has been disinterred may be found, giving the court a power to imprison such persons, or fine them "not more than one thousand dollars." And this law is passed, as if to make the thing more objectionable, at a time when it is well known that heavy damages may be obtained in any court of law from practitioners of

medicine in cases of mistake or error arising from ignorance of anatomy. Will it be believed, too, that recently, when some attempt was made in our legislature to mitigate the severity of the law, the proposition was hardly listened to with decency, members seemed anxious to outdo each other in expressions of abhorrence, and the bill was not even allowed a second reading?

Undignified, to use no harsher term, as these proceedings certainly were, they did much to aid the object they were intended to frustrate. They called the attention of those to the subject who were best qualified, by their pursuits and occupations, to enlighten the public mind. At the first meeting of the Counsellors of the Massachusetts Medical Society after the occurrence in the legislature above alluded to, it was voted that a committee be appointed to prepare a petition to the legislature "to modify the existing laws which now operate to prohibit the procuring of subjects for anatomical dissection, and to report the same for the consideration of the society at their annual meeting in June." This vote was passed in February, 1829.

At the meeting of the society in June following, which was fully attended by physicians from all parts of the commonwealth, the committee reported that, though they had prepared a petition in conformity with their instructions, it was not expedient, in their opinion, to offer it at present; but they recommended that the subject be referred to a large committee, whose object should be to prepare the public mind for the adoption of such measures as the wants of science and humanity imperiously demanded. In the discussion which took place on this occasion, it was urged on all sides that the time had arrived

when it had become necessary for medical men to speak plainly on the subject, and to throw aside the caution and reserve which they had hitherto maintained in relation to the importance of dissection.

A committee of nine was then unanimously chosen, with directions to report to the Counsellors in October. This committee, without delay, issued a circular letter to the Fellows of the Society, pointing out the topics on which they intended to urge their views, and asking for any information or suggestions that might aid them in advancing the objects proposed. At the Counsellors' meeting in October, they were requested to continue their attention to the subject, and, at the same time, were authorized to make expenditures to a certain limited amount. In consequence of this, they published the address the title of which is prefixed to this article. It was widely circulated in its original form, and, having been copied into many of the newspapers of the day, it has gone into almost every family in our community, and has been extensively read. It is unnecessary, therefore, for us to make any extracts from it. It is a plain, unpretending and judicious appeal to the common sense of its readers; and abounds with facts and statements, within the comprehension of all, which place in a strong light the necessity of anatomical knowledge. It has made a deep impression on the thinking part of society, and, with the other means that have been employed, it has for the time wrought a marvellous change in public opinion.

Shortly after its publication, a member of the Massachusetts House of Representatives moved that the Committee on the Judiciary be instructed "to inquire whether it is expedient to make any further provision by law for pro-

tecting the sepulchres of the dead;" and, in consequence of this, the committee, in February, 1830, made a very full and satisfactory report; stating the inconveniences under which medical men now labor with respect to the acquisition of anatomical knowledge, its vast importance to society, and the necessity of adopting some measures to legalize dissection. Though no definite plan was recommended, the whole tone of the report was liberal, and showed that a great change in public sentiment must have been produced on this subject within a year.

Some idea of the extent of this change may be formed from the fact that, in the winter of 1829, the proposition to mitigate the severity of the law against those who were engaged in dissection was driven almost by acclamation from the legislature; and, in June, 1830, the governor, with an honorable independence that has marked the whole course of his administration, in his message to the two houses, brought the subject before them in a very forcible manner, and that part of his message was referred to a joint committee of the Senate and House.

A few days after this, the annual meeting of the Massachusetts Medical Society took place, when resolutions were adopted, in which the course taken by the governor was noticed with great respect, and the Counsellors were instructed "to adopt such measures as they may deem proper and expedient to accomplish the wishes of the Society." In consequence of these resolutions, a new committee was appointed by the Council, with full power to act in behalf of the Society, and a further expenditure was authorized, if deemed necessary, to aid the object. And this is the present state of the business.

We have been thus particular in our account of the

proceedings that have been adopted in relation to this affair, because we deem them honorable to all parties; highly so to those who have been instrumental in calling the public attention to the subject, and not less so to the community, who have shown a disposition to examine with impartiality a subject which is so often viewed with jealousy and distrust. We have taken pleasure, too, in recounting what has been done, because it augurs so well for the future. It shows how much may be accomplished by the united efforts of a few, when ardently engaged in the promotion of a praiseworthy object; and that the most deeply-rooted prejudices will yield, when assailed by no other weapons than those of truth. The change in public sentiment, with regard to dissection, is indeed encouraging; and if similar efforts are perseveringly made, we have a right to hope that everything will soon be accomplished that the friends of science and humanity could wish.

It is conceded now, we believe, on all hands, that a knowledge of anatomy, such as can only be obtained by dissection, is essential to the education of every physician as well as surgeon; we mean every one who hopes to practise his profession with comfort to himself, and with safety and advantage to his patients. To those who are conversant with the subject, it is well known that more and greater improvements have been made in surgery, in the last half-century, than in any two centuries that preceded it; and we hazard nothing in saying that these may all be traced to the minute and thorough acquaintance with anatomy possessed by those who made them. We will, for a moment, call the attention of our readers to one topic, calculated in our opinion to illustrate our remarks. We allude to the disease known by the name

of aneurism. This consists in an enlargement or rupture of one or more of the coats of an artery, which is the name of the vessels through which the blood is conveyed from the heart to the various parts of the body. A pulsating tumor appears in the course of one of these vessels, producing great disturbance, oftentimes, in the circulating system, and steadily increasing in size. If nothing be done to remove it, a sudden rupture takes place, and if the vessel be an important one, the patient instantly dies. In former times, when the disease appeared in the extremities, the only certain mode of relief consisted in amputating the limb; but the tumor was often too high up, or it appeared in the neck, or in some other part, where no such operation could be performed. In these cases, therefore, the miserable victim was left to his fate, anxiously dreading the moment which he knew must soon arrive, and instantly terminate his existence. How different is the case at the present day! A patient presents himself to a surgeon with a large, pulsating tumor at the angle of the jaw; he complains of the great distress which it produces, the vertigo and other affections of the brain, and describes it as increasing daily, perhaps with rapidity, and bringing with its growth an increase of suffering. He is told that he may be relieved, probably cured, by an operation of a very delicate nature, but safe in skilful hands, and attended with but little severe suffering. He submits. An incision is made in the neck, the artery is laid bare below the tumor, a string is passed around it and tightly tied, and the supply of blood being thus cut off from the tumor, its growth is instantly stopped, absorption soon takes place, and a radical cure is effected. Now, this operation — one of the greatest triumphs of modern science — could never

have been devised, and successfully performed, without long, laborious and minute dissection. It was, in the first place, to be ascertained how those parts were to be nourished which were supplied with blood by the vessel that was to be tied; and, having ascertained this, the operator was next to prepare himself for the operation, by repeatedly and carefully dissecting everything that had any immediate relation with the point on which he was to operate; for there is but a hair's-breadth between the vessel he wishes to tie and other parts, which, if tied or wounded, would produce instant death.

It may, perhaps, be said, that we are now acquainted with the fact that a vessel may be tied without producing the death of the parts which it furnishes with blood, and, therefore, that there is no further occasion for dissection on this account. This is true, but this fact never could have been ascertained without dissection in the first instance, nor without it can we with safety perform the operation now.

But there are other points of nearly, perhaps quite equal importance, that remain to be ascertained, and which never can be ascertained without actual dissection. We refer particularly to the functions of the nerves and the agents of absorption. The light shed upon the former by the labors of Mr. Charles Bell is in the highest degree encouraging, and it may be confidently hoped that discoveries, not only valuable in physiology, but tending to the alleviation of human suffering, may ere long be made.

We think it unnecessary, however, to press these topics, though we might easily multiply illustrations from the practice of medicine, as well as that of surgery, quite as forcible as the one we have given; but we deem it super-

fluous, and shall consider it as admitted that anatomical knowledge is essential for medical men, and proceed to inquire how they are to be furnished with the means of acquiring this knowledge.

The subject is an embarrassing one; and while we feel it to be our duty to urge the adoption of measures for the removal of the difficulties that stand in the way of dissection, we are at the same time aware that this should be done with caution, and a proper regard to popular prejudice. We have a great respect for the common feeling in relation to the dead; it is associated with some of the purest and best sentiments of our nature, and we trust that nothing will be done that is calculated in the least degree to destroy or impair it. But no one will pretend that the dead can be injured by dissection; reason and revelation forbid us to suppose it. It is in relation only to the survivors that the question is to be considered. In any measure, therefore, that may be adopted, care should be taken that these be treated with a sacred regard, nor do we see anything inconsistent with this in the plan that has been suggested by the Medical Society.

There is no greater mistake, and none at the same time more common, than that physicians have a particular interest in this question; and hence it has often been said that they are bound to set a good example, and direct that their bodies should be dissected after death. In fact, if we may credit the accounts contained in some of the foreign journals, not a few medical men in Dublin have so far yielded to this popular notion, as to agree that this disposition shall be made of their bodies at their decease. But medical men can derive no more advantage from an improved state of anatomical knowledge than the rest of

the community; and, therefore, if it be a hardship, there would be no more reason why they should yield their bodies for dissection than any other individuals. There is, however, a stronger ground than this, and that is, the injury that would be done to the feelings of the living. We presume that there are few, if any physicians, who would object to having their bodies dissected after death; but they would be unwilling to have it known during their lives that this was to take place, as it might prove a source of great distress to their friends, and, if it were not known, no benefit could be derived from the example. The body of no individual should be dissected when the circumstance would give pain to any survivors. And this is one reason why the bodies of convicts should not, as a thing of course, be yielded up for dissection; many of them have friends, who have already suffered too much during their lives, without having their feelings lacerated at their death. Besides, it is desirable not to attach an odium to dissection, and make it appear as if it were a part of the punishment of the crime of the individual.

We are aware of the difficulty of adopting any course that will meet the wants of science, without coming in collision with the popular feeling. It is a subject of extreme delicacy, and should be approached with caution. Great allowance must be made for the almost instinctive horror which is entertained by nearly every individual in relation to dissection, and everything should be studiously avoided that is calculated even remotely to increase this horror. Mankind are so excitable on this subject that they suffer themselves to be governed rather by impulse than reason; and though this is to be lamented, the fact must not be overlooked.

The plan that seems to us to be the most unexceptionable — for there is none to which some objection may not be made — is to grant authority to the municipal officers of the towns and cities of the commonwealth to deliver up, at their discretion, to such regular practitioners of medicine and surgery as may appear to them to be suitable persons, the bodies of such paupers as may die and require interment at the public expense. This, however, shall in no instance be done, if any relative shall appear and request that the body may not be given up for dissection, or if any friend come forward and offer to defray the expenses of interment. We are aware that objections are made to this, and it is said that the inevitable sufferings of the poor are sufficient already, and that we have no right to increase them by providing for the dissection of their bodies at their death; for it is presumed that the idea that this is to take place would be a cause of great distress to most of them. In reply, it may be urged that in our country few will become so poor as to depend on the public bounty who do not bring their poverty on themselves by their vices; and that we have as much right to dispose of their bodies at their decease as we have to determine how they shall be provided for while living; as that, for example, they shall live in buildings of a particular description, be furnished with brown bread instead of white, and sleep on straw instead of feathers. Besides, it should be considered that there are not many who are so friendless as to have no one who would appear to prevent the dissection of their bodies, if they should entertain any peculiar horror on the subject; and, with regard to those who are so destitute of friends, it is better, perhaps, that they should have a little mental suffering, than that the cause of knowledge and the best interests of mankind should be retarded.

We do not believe, however, that if the system proposed shall go into operation, it will be productive of much distress of mind to the inmates of our poor-houses, or to the paupers that may be supported out of them. It is obvious that the bodies of all such persons would not be wanted at every season of the year, and for six months at least in each year the business of dissection must be entirely suspended. No one, therefore, could feel certain that such a disposition was to be made of his body at death, and the very uncertainty would be sufficient to lessen the dread that he might otherwise entertain in relation to it. And in those cases, too, where there was a deep-rooted aversion to this disposition of the body, an application to the municipal authorities would, no doubt, in every instance be sufficient to prevent it. In France, a system somewhat similar, though much more rigorous, prevails; there, the bodies of all who die in the hospitals, as well as the poor-houses, are sent to the public dissecting-rooms, unless individuals come forward and inter them at their own expense; and yet no inconvenience has been experienced from it in that country; individuals are found as ready to enter the various establishments for the relief of the sick and poor there as elsewhere.

We really think that there is a morbid sensibility on this point, that ought not to stand in the way of a great public improvement. There are some who can feel very keenly for those who have a dread of dissection, but have no sympathy for another class of sufferers, who are laboring under diseases of the most agonizing kind, the cure of which can only be accomplished by an improved state of anatomical knowledge.

It is very clear that, if some provision be not made to

furnish subjects, violations of the grave will continue to occur; and whenever a single instance of this kind is discovered, as must undoubtedly sometimes be the case, the feelings of the whole community will be more outraged than they could be, under the system proposed, in half a century. At present, too, the hazard attending these violations is so great, that only desperate and hardened individuals will engage in the business, and such persons are not very scrupulous as to whose sepulchres they violate; so that no one, under the existing state of things, can feel certain that the remains of his dearest friend may not be disturbed. So great is the risk in obtaining subjects, that the supply is not equal to the demand; and the price is, consequently, so exorbitant, as to place them, in a great measure, beyond the reach of students of moderate means.

This operates very injuriously on the middling classes of society, either by preventing them altogether from educating their children to the profession of medicine, or by putting it out of their power, if they do so educate them, to give them the facilities which are almost indispensable to success. To the rich, this is comparatively of but little importance. Their sons can seek in other states and countries, where a more liberal policy prevails, the opportunities that are denied them at home; and they thus have it in their power to obtain a rank in their profession, at the outset of their career, which hardly anything else can give them. If this system of prohibiting dissection is to be persisted in, no physician or surgeon should be held accountable at law for any error arising from ignorance of anatomy. But we hope for better things. We will not allow ourselves to doubt that everything which should be done will ere long be accomplished. A great change in

public sentiment has already taken place; and the great mass of the community will soon understand that they, and they only, will derive benefit from the contemplated measure. We repeat that the members of the medical profession have no particular interest in it; if it should be adopted, more will be expected of them, and their labors will be immensely increased, without any increase of compensation. It is absurd to suppose that they can have any sinister motive for the efforts they are making; it is impossible that anything but a love of science, a desire to advance the cause of humanity, or an honorable ambition for professional renown, could induce them to engage in so loathsome an occupation as that of dissection.

It cannot be too often repeated, nor too much insisted on, that it is the great mass of the people who are to be benefited by giving facilities for acquiring anatomical knowledge, and thus raising the standard of medical education. The rich can command the highest professional attainments wherever they are to be found; but the man of moderate means must content himself with such as are within his reach. It is obviously for his interest, therefore, that all the professors of the healing art should be skilful and well-instructed; and this cannot be the case under the present system.

Whatever may be the result of the measures now in progress, they cannot fail to be productive of good, from the discussion that has been elicited; and the Fellows of the Massachusetts Medical Society will be entitled to the gratitude of the friends of learning for the active part they have taken in promoting them. It is creditable to them to have led the way in recommending a system, which could not fail at first to be viewed with jealousy and

distrust; and it is to their honor that they have not been deterred from pursuing it by the fear of the obloquy and reproach to which they might subject themselves. They must have known, before taking a step in the business, that their motives would be assailed by those who were hostile to the measure they advised; and we respect them the more, because, disregarding all narrow and selfish considerations, they were willing to step aside from their ordinary course, and urge upon the community the adoption of a system, which, however excellent it may be in itself, might, in the first instance, make its advocates obnoxious. Of their ultimate success we will not allow ourselves to doubt.

CHOLERA.

THE first case of Cholera in Boston occurred about the middle of August, 1832. The approach of this formidable epidemic was viewed with great alarm, from the opinion that many entertained of its mode of propagation. This apprehension was increased in no small degree by an article in the *London Quarterly Review* for December, 1831, which maintained very ably the contagious character of the disease.

Having read, with great interest and attention, all the reliable publications on the history and progress of this desolating scourge to which I could at that time get access, I came to a different conclusion; and, in the hope of doing something to allay the panic, I prepared the following article, which was printed in the *North American Review* for July, 1832.

It is hardly necessary to add that the history of cholera in our country has confirmed the correctness of the views I then took, and that almost all medical men are now satisfied of its non-contagious character.

March, 1855.

No apology can be necessary for calling the attention of our readers to the subject of the Cholera. The great

extent of territory over which this scourge of the human race has already passed, the violence and fatality of its character, its total disregard of climate, the uncertainty as to the mode by which it is propagated, and, above all, the well-grounded apprehension that it may yet reach our continent, make it a topic of deep and fearful interest to the whole community. We feel it to be our imperative duty to contribute our aid to enlighten the public mind, and to allay, in some measure, the alarm that has been excited on this subject; and we know of no way of doing this so effectually, as by examining the mode in which the disease is propagated, or, in other words, discussing the question whether it be contagious or not. This can be done in a manner perfectly intelligible to all persons, merely by discarding the professional language, which is commonly used in this discussion, but which is by no means essential to the perfect understanding of the subject.

It is our intention, then, to confine ourselves to the examination of the question of contagion, leaving all the points connected with the history, symptoms, and mode of treatment of the disease, to professional works. These have all been ably treated in the numerous publications which this pestilence has brought to light, and they are the very topics on which those at a distance are the least able to give an opinion; while their situation, remote from the controversies that have been going on, enables them to examine the evidence as to the contagion of the disease with more fairness and impartiality than those whose personal feelings have become enlisted on either side of the question.

As the article in the ninety-first number of the *London*

Quarterly Review, on the subject of Cholera, has been extensively circulated in this country, and has produced a great influence on the public mind, and as it embodies nearly all the evidence and arguments in favor of the contagious character of the disease, we shall examine with some attention the reasons which the writer of it assigns for his opinion, and such others as we have seen in other writers, point out as far as we are able their fallacy, and then bring forward the evidence, which, to our minds, is irresistible, against the doctrine of contagion.

It may be well to premise that the terms *contagion* and *infection* are now often used in a very loose sense, one of them frequently in a different one from that which its etymology would indicate. By most writers, as in the article in the *Quarterly Review*, they are employed as synonymous terms. The term *contagious* (from *contingo*) was originally applied to those diseases only which were communicated by *contact* with the sick, as the plague, itch, &c.; while that of *infectious* (from *inficio*) was employed to designate those which arose from any noxious matter, whether proceeding from a diseased animal body, or any other source; so that all contagious diseases were embraced under the term infectious, though all infectious ones were by no means included under that of contagious. But the term contagion is not now used in this restricted sense, either by medical or popular writers. All diseases are at the present day called contagious which can be communicated from the sick to the well, without regard to contact; and it is not uncommon to use the term infectious as synonymous with it, though it is also employed to denote those diseases which arise in certain seasons and climates from noxious exhalations. The fact, then, seems

to be, that the term contagion has a more extended meaning than formerly; and we shall accordingly use it to denote that property of a disease which enables it to communicate the same disease to those in health, either immediately or mediately; that is, either by contact, or by imparting the contagious principle to the air or other inanimate substances.

The cholera had occasionally appeared, for many years, in various parts of India; but it did not till the year 1817 assume the epidemic and fatal character which it has since exhibited in so remarkable a degree. In that year it is admitted by all writers that it broke out simultaneously in different parts of the province of Bengal, appearing as an endemic, dependent on the state of the soil, climate, season or atmosphere, and that it was not owing to contagion. This is conceded by Scott, Kennedy, and others, who contend for its contagious character, as well as by those who deny it. But the two parties differ entirely as to the mode in which it was afterwards propagated; one contending that it is by contagion, while the other insists that it is dependent on a peculiar state of the atmosphere, not cognizable by our senses. We shall not notice the opinion of those who attribute it to a combination of these two causes, as it is unphilosophical to assign two causes for an effect, when one is sufficient to account for it; nor that which considers that it may be owing to some noxious exhalations from the earth, for it has raged with great violence, particularly at Orenburgh, during the severity of winter, and when the earth was covered with snow.

In India, the opposers of the doctrine of contagion were by far the most numerous. It is remarked by Mr. Wil-

liam Scott, the author of the Madras Report, and a decided advocate of the contagiousness of the disease, that "If this question could have been decided simply by the opinions of a majority of medical men, it would have been already set at rest *against the doctrine of contagion* or infection; for there are few subjects, perhaps, on which so little diversity of sentiment has existed." But, as questions of this sort cannot be settled in this way, let us look a little at the reasons assigned by the advocates of contagion for their opinion.

One of the reasons assigned in the *Review* is, that the cholera, in its progress both in Asia and Europe, has passed along "the great thoroughfares of the country" through which it has travelled. This, no doubt, is true in part; but it has not been confined to those thoroughfares, nor does it follow all of them. It appeared at Calcutta as early as August, 1817; and though there was constant intercourse by water with Madras, it did not reach the latter place till October, 1818, travelling at the rate of little more than two miles a day, and visiting all the intermediate places. Now, does this look like the course of a contagious disease? Does it not look rather like the progress of some atmospheric poison? If it had been propagated by contagion, is it not probable, as there were no quarantines, no interruption of intercourse with the sick, that some who had become infected would have left the city immediately after, before they were aware of it, and sickened with the disease at a distance? Is it not probable that it would have appeared on board of some of the country trading ships bound to Madras, and thus have been conveyed to that city in a few weeks or months at the furthest, if it could have been so conveyed, instead

of passing over land at a regular and slow rate of progress, and not reaching Madras till more than a year had elapsed?

It is well known that the cholera spread in various directions from the province of Bengal, travelling towards China in one direction, across the Delta of the Ganges in another, and extending on the south and east nearly to New Holland. If it were propagated by contagion, why did it stop there? Why did it not extend itself over the vast continent of New Holland, passing along the great thoroughfares of the country? There were routes of human intercourse in that direction which it might traverse, and human beings enough for victims.

It is said with great confidence, in the *Quarterly Review*, that "whenever it invades a new country, it begins in a great commercial mart. There seems to be no exception to this law, except where the disease has been imported by invading armies." The cholera first broke out in Jessore, in the interior, about sixty miles from Calcutta, in 1817; and it travelled over the peninsula of India, in 1818, at the rate of about one degree a month, and did not reach the seaport of Madras, a great commercial mart, till it appeared simultaneously in parallel latitudes in the interior, though "some of the many trading vessels must have carried it speedily from the tainted districts to the seat of the presidency, had the disease been capable of being conveyed by man or merchandise."* It reached Madras on the 8th of October, 1818; and on the 10th of that month the port is annually closed for two months, in consequence of the surf and prevailing winds, and the

* Bell on the Cholera, page 80.

small trading vessels are drawn up on land. Notwithstanding this interruption of human intercourse, this singular disease travelled on over the next five degrees of latitude "even more rapidly than over the former six," and arrived at Cape Comorin by the 1st of January, 1819.

The facts just stated, and about which all the writers on the disease in the East are agreed, are a satisfactory refutation of another assertion of the *Quarterly Review*, which is, that the cholera "Does not attack a large space of territory of a new country at once, but gradually; the first point of attack being invariably on a frontier, or coast." This certainly was not the case in its progress in India; it appeared simultaneously in the interior and on the coast, and extended over a large tract of country at once.

Again, when it appeared on the Persian Gulf, it attacked several places remote from each other simultaneously, passing over a great extent of territory. Yet the assertion we have just quoted from the *Review* is given as if it were a well-known fact, universally admitted, in relation to the progress of the disease.

The reviewer states, as an additional argument in favor of the contagion of cholera, "That the rapidity of the propagation of the disease appears to have been proportional to the distances, and to the means of communication." If the previous history of cholera in Asia and the continent of Europe were not sufficient to satisfy him of the error of this statement, he must have perceived it before this time by what has occurred in the island of Great Britain. Three months nearly elapsed, after it broke out in Sunderland, before it appeared in London, notwithstanding the shortness of the distance, the facility and

frequency of the communication, and the absence of all quarantine on those who travelled by land.

Another reason, and perhaps the strongest that has ever been brought forward on that side of the question, and which is often urged in favor of the contagious character of cholera, is, that it extends itself in defiance of climate and season, and spreads as well in the cold regions of Russia as under the burning sun of the East, and regards neither the frosts of winter nor the heats of summer. It is not, perhaps, strictly true that it is wholly uninfluenced by season; it is supposed to have been checked between Arabia and Syria in 1821, and at Astracan in 1823, by the approach of winter; but it cannot be denied that, though cold may retard its progress, it does not destroy the disease, and in some instances, as at Orenburgh, it does not seem to check it.

But does it differ, in this independence of climate and season, from other epidemics that have been propagated by atmospheric influence?

"The influenza of 1781 and 1782 is said to have originated in China, and to have travelled through Asia into Europe; where it crossed the Atlantic, and arrived the ensuing year in America."*

The influenza of 1815 originated also in China, and spread throughout Asia, Europe, and this country. It has been stated, in regard to the epidemic of that year, that the crews of several vessels on the Atlantic became affected with the disease at sea, in consequence of having fallen in with the current of air which was bearing the germs of the influenza across the Atlantic.

In the second volume of Freind's History of Physic may

* Hawkins on Cholera, page 208.

be found a short account of an epidemic that originated in Asia about the year 1345, "and from thence travelled over all the world, and destroyed a *fourth* part of mankind; in the East it lasted three years, and was more mortal." Webster, in speaking of this pestilence, says that the facts connected with it annihilate, at a blow, the whole doctrine of the propagation of that disease from country to country by infection.

The most remarkable epidemic, however, of which we can find any record, first appeared in the year 540. We extract the following account of it from Webster's History of Epidemic Diseases, who transcribed the particulars, he says, from Procopius and Evagrius, two contemporary historians:

"Procopius relates, that this pestilence, which almost destroyed the human race, and for which no cause could be assigned but the will of God, did not rage in one part of the world only, nor in one season of the year. It ravaged the whole world, seizing all descriptions of people, without regard to different constitutions, habits, or ages; and without regard to their places of residence, their modes of subsistence, or their different pursuits. Some were seized in winter, some in summer, others in other seasons of the year.

"It first appeared in Pelusium, in Egypt, and thence spread westward to Alexandria, and all parts of Egypt; eastward towards Palestine, and extended to all parts of the world, — laying waste islands, caves, mountains, and all places where man dwelt. If it passed by a particular country at first, or *slightly affected it*, it soon returned upon it with the same desolating rage which other places had experienced. It began in maritime towns, and spread to the interior country.

"Neither physician nor attendant caught the distemper by contact of the sick or dead; and many, encouraged by their wonderful escape, applied themselves with assiduity to the care of the sick and the burial of the deceased."

We will make one short extract only from Evagrius:

"But what, above all, appeared singular and surprising, was that the inhabitants of infected places, removing their residence to places where the disease had not appeared, or did not prevail, were the only persons who fell victims to the plague in the cities which were not infected."

The duration of this pestilence has been stated to have been fifty-two years; though Webster thinks that there was a series of severe epidemics during that period, and not a single epidemic only.

We have presented this account in the language of the writers themselves, lest we should be suspected of having given a coloring to it favorable to our own views. With the slightest attention, it will be seen how much this pestilence resembled the cholera in its progress. It regarded neither climate, nor season, nor situation; if it passed by a place, it afterwards returned to attack it, as cholera is known to do; and it began in maritime towns, as it has been said that cholera does, and thence spread into the interior; and yet this was admitted to be an atmospheric disease, not communicated by contact of the sick or the dead.

We have now completed our examination of what the reviewer calls his first class of evidence, "resting solely on those facts concerning the rise and progress of the malady which are admitted by every one," and shall next pass in review his second class, or the direct evidence of the contagiousness of the disease. He divides this latter evidence

into three kinds. The first proves the contagious character of the disease *positively*, as when it has been propagated by the known intercourse of the uninfected with the infected; the second proves it *negatively*, as when it is shown that they who avoid intercourse with the sick escape the malady, though living under the same general circumstances of climate, food, &c.; and the third includes what are called facts of coincidence, as when the disease breaks out in a healthy place, after the arrival, from infected places, of individuals not laboring under the malady. On this last order of facts mainly depends the evidence in favor of the propagation of the disease by merchandise, and other inanimate substances.

1. Under the first head the reviewer adduces several facts to show that the cholera broke out in places through which armies had marched, or that it attacked a detachment of troops, before uninfected, on joining another in which the disease existed. That our readers may be the better able to judge of the value of these facts, we must ask their attention to the following cases:

In November, 1817, the cholera broke out in the great Indian army, under the command of the Marquis of Hastings, consisting of ten thousand troops and eighty thousand followers, then concentrated near the banks of the Sinde, in Bundlekund. Such was the violence of the disease, that in a little more than twelve days nearly nine thousand persons fell victims to it. The commander, perceiving that the plans of his expedition would be frustrated, if the whole army were not destroyed, by the disease, determined to change his place of encampment. Though compelled to leave many of the sick behind, he carried many with him, and at length pitched his tents fifty miles from his former

position, on a dry and elevated spot; "on the 19th he crossed the clear stream of the Betwah, and upon its high and dry banks, at Erich, he got rid of the pestilence, and met with returning health."*

Another case, equally striking, may be found in the same report. An immense concourse of people, believed to be between one and two millions, were assembled on the banks of the Ganges in the month of April, to celebrate a religious festival.

"It is the custom of the pilgrims to repair to the banks of the river, where they pass the night with little if any shelter; many persons being crowded together under the cover of a single blanket, thrown out as an awning. The temperature is very variable; the days being hot and the nights cold, with heavy dews, and sudden chilly blasts from clefts in the mountains.

"On the present occasion these causes were sufficient to generate the cholera; which broke out soon after the commencement of the ceremonies, and raged with such fury, that in less than eight days it is said to have cut off above twenty thousand victims. But so confined was its influence that it did not reach the village of Juwalapore, only seven miles distant; and ceased immediately on the concourse breaking up, on the last day of the festival."

At the one hundred and thirty-third page of the work from which we have just quoted may be found an account of the disease prevailing to a great extent in a detachment of troops, yet, on joining another body only five miles distant, though the men of this party, who had been exposed to the disease, mixed promiscuously with those of the

* Bengal Report, page 16.

Sauger troops, not one individual of the latter got the disease.

In a note in the two hundred and forty-second page of Annesley's work on the diseases of India, is the following statement:

"Cholera attacked the field force stationed at Malligaum, in Kandiesh, and raged with great violence amongst the corps posted on the left of the line; while the seventeenth battalion of native infantry, who were posted on the right of the line, were exempt from it, notwithstanding they had continued communication with the other men. But although they were exempt from the disease while they remained in this position, they suffered very much from cholera on their march from Malligaum to join Major-General Sir John Doveton's force in the Ellichapoor valley."

The latter part of this statement is highly important, as it shows that the exemption of the men did not arise from the absence of predisposition for the disease.

The information contained in the following extract from Mr. George H. Bell's admirable work on cholera is so valuable that we give it at length, and in his own words:

"In July, 1819, I marched from Madras in medical charge of a large party of young officers, who had just arrived in India, and who were on their way to join regiments in the interior of the country. There was also a detachment of sepoys, and the usual numerous attendants and camp-followers of such a party in India. The cholera prevailed in Madras when we left it. Until the fifth day's march (fifty miles from Madras) no cases of the disease occurred. On that day several of the party were

attacked on the line of march; and during the next three stages we continued to have additional cases. Cholera prevailed in the country through which we were passing. In consultation with the commanding officer of the detachment, it was determined that we should endeavor to leave the disease behind us; and, as we were informed that the country behind the Ghauts was free of it, we marched without a halt until we reached the high table-land of Mysore. The consequence was, that we left the disease at Vallore, eighty-seven miles from Madras, and we had none of it until we had marched seventy miles further (seven stages), when we again found it at one of our appointed places of encampment. But our camp was, in consequence, pushed on a few miles, and only one case — a fatal one — occurred in the detachment. The man was attacked on the line of march. We again left the disease, and were free from it during the next hundred and fifteen miles of travelling. We then had it during three stages, and found many villages deserted. We once more left it, and reached our journey's end, two hundred and sixty miles further, without again meeting it. Thus, in a journey of five hundred and sixty miles, this detachment was exposed to, and left the disease behind it, four different times: and on none of these occasions did a single case occur beyond the tainted spots." — pp. 90, 91.

It appears that in the four first cases just cited large bodies of men, part of whom were then laboring under cholera, and all of whom had been exposed to its atmosphere, on going into other districts and associating with those in health, did not in a single instance convey the disease to other persons; and in the extract from Mr. Bell we see that men in health, while passing through

an infected district, without any communication with any human beings who had the disease, became the subjects of it, and yet were unable to communicate it to others; and that the disease ceased as soon as they had passed through the infected district, and appeared again on entering another.

In stating that cholera has frequently broken out during the march of troops in India, or when one detachment has joined another, as evidence of contagion, the writer seems to have forgotten the fact that the exciting cause of the disease, whatever it may be, was everywhere lurking about in that country, waiting only for the predisposing causes to enable it to attack. Nothing is more likely to produce this predisposition than the fatigue and exhaustion consequent on such marches in such a climate.

The occurrence of the disease in villages through which troops have passed, or its appearance in one detachment, which had been previously exempt, when another had joined it, ought to be considered, when viewed in connection with the strong facts on the other side, as a coincidence that might occur in India at any time since cholera was first epidemic there, or in any country where the disease prevailed. At any rate, it cannot be considered as *positive* evidence of contagion.

2. We come now to the reviewer's second division of facts, which, according to him, prove the contagiousness of the disease *negatively*. These consist of statements of cases of individuals who, in places where cholera has prevailed, have escaped by insulating themselves, and cutting off all communication with other parts of the infected district. This course was adopted by the French consul, when the disease was at Aleppo. He retired with two

hundred other persons to his country seat, at some distance from the city, and they all escaped the epidemic by a rigid quarantine. "The large establishment of military cadets at Moscow was preserved by a similar plan from a scourge which was so active on all sides." Whole towns are said to have escaped by adopting the same means.

We admit the facts stated above, but we by no means assent to the reason assigned for this exemption from the disease. Even the advocates of contagion acknowledge that those only are attacked with cholera who have a strong predisposition for it; and they place among the principal predisposing causes intemperance and excess of all kinds, deficiency of food, food of bad quality, the debilitating passions of the mind, and excessive fatigue. Is it probable that persons thus secluded would labor under any of the predisposing causes? They are, for the most part, persons in health, of ample means to furnish themselves with all the comforts of life, and, at the same time, aware of the danger of indulgence. It could not be expected that such persons would be attacked, unless the affecting cause were more virulent than ordinary.

But a perfect answer is, that all these precautionary measures have not unfrequently been unavailing, and that the disease has broken out in towns subjected to the most rigid quarantine, and in places perfectly insulated. This was the case at Thorn, as appears from the following extract of a letter from the British Minister at Berlin to Lord Palmerston, dated July 26th, 1831:

"My Lord: The cholera has broken out at Thorn, notwithstanding the strict measures of precaution adopted there. Signed, G. W. Chad."

The case of Egypt may be cited as an example of the same thing on a larger scale. The *Quarterly Review*, which contained the statement that this country had escaped the cholera in consequence of the vigor of her quarantine system, was hardly out of the press, before the news arrived in England that the disease had broken out in Egypt. In the *London Medical Gazette* of January 14, 1832, will be found an extract from a letter announcing this fact.

It entered Prussia, notwithstanding all the efforts made to exclude it. In the proclamation of the king, dated September 6th, 1831, he says, that the "Asiatic cholera had penetrated into his dominions, in spite of measures the most vigorous, precautions the most active, and vigilance the most sustained, which had all proved useless, and unsuccessful in averting or even checking its progress."

Dr. Jaehnichen informs us that the complete insulation of some persons, and even whole families, during the prevalence of the cholera at Moscow, did not always preserve them from it.*

Mr. Scott, in the *Madras Report*, states, that "At Masulipatam, a town on the Coromandel coast, the disease first appeared among the convicts confined in the fort, and that it was not till about ten days afterwards — July 10, 1818 — that it was observed in the town and neighborhood."

In the *Edinburgh Medical and Surgical Journal* for October, 1831, will be found, in some observations on cholera, by Dr. H. L. Gibbs, of St. Petersburg, an account of a patient who was attacked with cholera at the Naval Hospital, and died of it. "From the great precau-

* Page 24 of his work on the Cholera.

tion used in avoiding communication, this man, who was confined to his bed in the hospital, must have been affected, I think, by predisposition idiopathically;" and it appears that no other person, either before or after, had the disease in the hospital.

The exemption from cholera of some who have secluded themselves while it was raging in this vicinity does not prove that it is propagated by contagion; while its attack of others who have been equally secluded shows that it can be, sometimes at least, propagated by other means, — and this is sufficient for our purpose.

3. We come now to the third division, the *facts of coincidence*, as when the cholera breaks out in a healthy place after the arrival, from infected places, of individuals who do not themselves labor under the malady. On these facts depends the evidence in favor of infection by merchandise, or other inanimate substances. We shall examine two of the most important facts which the reviewer brings forward, merely remarking that if we can prove, as we think we shall be able to do, that the disease cannot be propagated by inanimate substances, the whole of this division falls to the ground.

The first of these facts is the supposed introduction of the cholera into the Mauritius from Ceylon, by the Topaz frigate. The disease reached Ceylon in 1818; but it did not appear in the Isle of France till 1819, at which time the reviewer says it was carried there by the frigate above named. In answer to this we will give an extract from an article in the *Asiatic Journal*, on the cholera, in which, by the way, the doctrine of contagion is maintained.

"The disease appeared extensively in the island in November, 1819, and has been supposed to have been

brought thither from Ceylon, by the Topaz frigate, which arrived at the Mauritius in October. But a careful inquiry into the circumstances of the case convinced a committee of British medical officers that the disease was not imported, nor of foreign growth. In their report, dated 4th of December, they state that the first case occurred so early as the 6th of September, and 'that they feel the strongest persuasion that it is not of a contagious nature, and that it is not of foreign introduction.' In these two conclusions the French medical gentlemen unanimously concurred; and both considered the disorder as promoted, if not produced, by the great and sudden vicissitudes in the temperature. The report adds, that a similar epidemic prevailed in the colony for some time in the year 1775."

Admitting, what we are by no means disposed to do, that the statement of the medical gentlemen of the island is incorrect, it is not pretended by the reviewer that there were any cases of the disease on board the frigate at the time of her arrival, or that any cases appeared there before the 18th of November, three weeks after; a period rather too long to suppose it possible that there could be any connection between them and the ship. Even the British Board of Health, all firm believers in contagion, have fixed the ultimate period which elapses between exposure to the cause and the appearance of the disease at five days. It is, perhaps, proper to observe, that the reviewer says that the disease was propagated in Mauritius by goods, or inanimate substances, which were carried there by the Topaz. We shall see, in speaking of the cholera at Warsaw, on what foundation this opinion rests.

From the Isle of France he states that it was conveyed to the Island of Bourbon, and speaks with some degree of triumph of the means that were adopted there to arrest its progress. His facts are all derived from Mr. Kennedy's work, for which we cannot be suspected of having any very strong partiality, when we state that he is so decided an advocate of contagion, that he will not consent to call the disease by any other name than that of the *contagious cholera*. We will therefore make the following extract from his book, and then offer a few comments:

"Taking advantage of the terrible example afforded in Mauritius, the governor of Bourbon, a neighboring island, distant about two degrees, adopted sanitary precaution to exclude the contagion. On the 7th of January, however, a vessel called the Pic-Var, from Port Louis, arrived off Bourbon, and had intercourse with the shore. The cholera broke out, seven days afterwards, in the town of St. Denis. Nothing dismayed by this unfortunate circumstance, the governor ordered cordons of troops to be posted to cut off all communication with St. Denis, the focus of the malady, and a lazaretto was established for the reception of such persons as might be attacked. Cordons were also established for their preservation at St. Susanne, St. André, and St. Benoit; but, in the consternation which seized the inhabitants of these parishes, they dispersed, to seek safety in the interior of the country. The alarm created by the pestilence in Bourbon, and the vigorous proceedings of the governor, Baron de Mylius, may be conceived from the concluding sentence of the order of the day, which was, *surveillance ou la mort*. The consequences of these measures corresponded to the decision with which they were carried into effect. The cholera did not extend in

Bourbon, as it had done in Mauritius, and the whole number of the persons attacked scarcely amounted to a few hundreds." — p. 204.

Admitting all the facts to be as he has stated them, it will be seen, in the first place, that there was no evidence that the cholera was on board the vessel that arrived off Bourbon; in the second place, that the cholera did not appear till seven days after she had had intercourse with the shore; and Mr. Kennedy, in another part of his work, lays it down as one of the laws of cholera, that "the period of time during which the contagion lies dormant in the system rarely exceeds three days;" and lastly it appears, that though a cordon was established, to prevent the intercourse between those who had been exposed to the sick and the other inhabitants of the island, yet all those who had been thus exposed broke through the cordon, and sought safety in the interior of the country. And what was the consequence? No one was attacked with the disease who went into the country, no one communicated it to another, and "the cholera did not extend in Bourbon, as it had done in Mauritius." A stronger case against contagion can hardly be imagined than this.

The second case referred to in the *Review* is the appearance of the disease at Warsaw. Let us look at the facts of the case. The battle of Iganie, between the Poles and the Russians, took place on the 10th of April, 1831; and on the night of the 12th and 13th twelve Polish soldiers were attacked with cholera, which soon extended to others, both in Praga and Warsaw, situated on the opposite sides of the Vistula. It was at once asserted that they contracted the disease from the Russian army. Is this probable? Is it possible that any man of that army

could have gone into battle while laboring under the cholera? and if not, the Poles were of course not exposed to any *persons* who had the disease; and it must have been taken, if taken at all from the Russians, from the contagious matter adhering to their clothes, or other inanimate substances. This, in fact, seems to be the opinion of the reviewer.

We would remark, in the first place, that it is very improbable that a contagious principle sufficiently powerful to affect others could be carried about by individuals in their clothes without affecting themselves. And, in the second place, most of the contagionists are now of opinion that the disease cannot be communicated by inanimate substances. In the official reports made to the British government by Drs. Russell and Barry will be found a paper from Dr. Doepp, Director of the Foundling Hospital at St. Petersburg, containing the following statement:

"I am of opinion that the exhalations of the sick are the carriers of the disease, but only so long as they retain their vaporous form. I have given myself great trouble to ascertain if the clothes and linen covered with the perspiration of the sick were capable of transmitting the contagion; but I could not meet with any instance of it. Children taken from the cold, clammy breast of the mother, or wet-nurse, and given over to another nurse to suckle, did not infect the latter. This occurred in my presence."

Dr. Albers, in his report to the Prussian government, concludes with the following sentence:

"I have met with no instance which could render it at all probable that the cholera is disseminated by inanimate objects."

In an official report of the British Central Board of

Health, all the members of which are contagionists, dated January 4th, 1831, are some statements which show the extreme improbability that the disease is ever propagated by inanimate substances.

"There is, perhaps," say they, "no question, in the whole range of sanitary police, in which so many and such irrefragable facts can be brought to bear as on this; derived, too, from the most authentic and recent sources. Seven hundred and thirty-two ships, loaded with hemp and flax from infected ports of the Baltic, arrived at the different quarantine stations in this country between the first of June and the 31st December, 1831. Many vessels also arrived laden with wool and hides, yet not a single case of cholera occurred on board any of these ships outside the Cattegat Sea, nor amongst the people employed in opening and airing their cargoes in the lazarets.

"At the hemp and flax wharves at St. Petersburg, where several thousand tons of these articles arrived during the spring and summer of this year, from places in the interior where cholera existed at the time of their departure for the capital, the persons employed in bracking or sorting, and who generally passed the night amongst the bales, did not suffer so early in the season, nor so severely, as other classes of the general population."

The evidence on this point — that the disease cannot be conveyed by merchandise, or other inanimate substances — is now considered by most, if not all the contagionists, as conclusive; otherwise, we should produce much more to corroborate our opinion. This, we think, renders it clear, then, that the disease was not introduced into Poland in this way.

There really seems to be no difficulty in accounting for

the appearance of cholera at Warsaw on the supposition that it was an epidemic, propagated by the atmosphere. It might very justly be said that the epidemic constitution of the air, which produces this disease, had reached Poland, and would attack those who were strongly predisposed to it. What stronger predisposition could be imagined than the one which we know the Polish soldiers at that time possessed? We translate the following passage from the work of M. Brierre-de-Boismont, an intelligent French physician, and a believer in contagion, who went from Paris to examine the disease in Poland, and has since published an account of it:

"If we imagine," says he, "thousands of men, pale, haggard, sallow and emaciated, whose features denoted suffering, weakened by long marches and privations of every kind, bivouacking, for five months of extreme cold, in the woods or on the ground, which was almost always marshy, we shall still have but an imperfect idea of the condition of these miserable victims of the war."

When we consider, too, the excitement of the battle, and the fatigue and exhaustion consequent on it, there seems hardly a predisposing cause of the cholera which did not operate upon them.

We have thus noticed the facts and arguments brought forward by the reviewer in favor of the contagion of cholera; but, as much light has been thrown on this subject by the progress of the disease during the last fifteen years, we must trespass a little longer on the patience of our readers.

It will be recollected that this disease first appeared as an extensive epidemic in the province of Bengal, in the summer of 1817. It reached Bombay in August, 1818,

and from this place the reviewer states that it was carried to the Arabian town of Muscat, about three hundred leagues distant, situated at the mouth of the Persian Gulf. He takes some pains to show the great commercial relations subsisting between Bombay and the ports on the Persian Gulf as early as the year 1818, stating that there were at that time one hundred and twenty ships, employing one thousand hands, besides "seven hundred and thirty country ships, which, belonging to the various ports of the western coast of India, often touched at Muscat in their voyages to more distant lands." The intercourse between Bombay and Muscat is no doubt great, and no quarantine was at any time imposed on the vessels, or on their cargoes, crews or passengers; so that if the disease could have been conveyed in this way, it would no doubt have soon been done. But what was the fact? The cholera did not appear in Muscat till June, 1821, nearly three years after it attacked Bombay; and no one has pretended to point out the ship that carried it there.

It appeared on both sides of the Persian Gulf, extending over a considerable part of Arabia and Persia. "Bassora, which is situated at the head of this gulf, on the river Euphrates, was attacked," says the reviewer, "nearly at the same time as Muscat," though it is ten degrees to the northward of it. Moreau-de-Jonnès, the oracle of the contagionists, puts down the appearance of the disease in the two places in the same month; and this took place before it had visited the intermediate country. The simultaneous appearance of the disease in places so remote from each other it is wholly out of our power to explain on the principle of contagion, though the difficulty vanishes if we suppose the seeds of the pestilence to be conveyed by the atmosphere.

It reached the desert which separates Arabia and Syria in the autumn of 1821, and ceased on the approach of winter; but reäppeared, without any assignable cause, in the following spring, in the neighborhood of the Tigris and Euphrates, and arrived on the shores of the Mediterranean in August, 1823. "Once established," says the reviewer, "on the shores of the Mediterranean, every facility to its immediate transmission into European ports appeared to be offered;" and it no doubt would have been transmitted there, if it were possible thus to have conveyed it. No quarantines were laid; no restrictions of any kind were imposed; the great "thoroughfares of the country" were thronged with human beings; but the disease did not follow in their train, and it ceased spontaneously at Tripoli, in Syria, having attacked, it is said, only thirty-one persons, out of a population of fifteen thousand.

On the other side of the gulf, it extended through Persia, and finally reached Astracan, at the mouth of the Wolga, on the Caspian Sea, in the autumn of 1823. Here again the disease seemed to threaten Europe; and it would no doubt have been conveyed throughout the vast territories of Russia at that time, by passing up the Wolga, one of the great thoroughfares of the country, if it had depended on contagion for its propagation. But, as was before remarked, it subsided at the approach of winter, and finally disappeared.

During the six succeeding years, no alarm was excited by it in any portion of Europe. It appeared, however, in various parts of Persia, China, and other countries of the East, and raged at times with great violence. Towards the close of 1826, it broke out in Mongolia, and reached almost to the borders of Siberia.

In August, 1829, it appeared at Orenburg, the capital of the Russian province of that name, and continued for about three months in the city, and till February, 1830, in other parts of the province. It has been asserted, on the authority of M. de Jonnès, that the disease was carried there by the caravans, who bring across the steppes of Boukara the merchandise of China, Thibet, Caboul, and Hindostan. It might be enough to say, in answer to this, that the official reports of the Russian government admit that there is no evidence of the fact. Professor Lichtenstædt, after a most careful investigation of the subject, acknowledges the same thing; and the editors of the *Edinburgh Medical and Surgical Journal*, who believe in the contagious character of the disease, say that there is no reason to suppose that the cholera was brought from the East or elsewhere to Orenburg. This, in ordinary cases, might be thought conclusive; but, as we wish to show how much credit is to be attached to the statements of M. de Jonnès, who first asserted that the disease was carried by the caravans, and who is the great source whence the *Quarterly* reviewer derives his facts in favor of contagion, we shall give the following extract from the thirty-second volume of the *London Asiatic Journal*.

M. Moreau de Jonnès read a paper before the French Academy of Sciences, November 22, 1830, on the Progress of the Cholera. Among other things, he stated that the disease was carried to Orenburg by the caravans from the East.

"M. de Humboldt, who was present when the paper was read, remarked that it appeared improbable that the *cholera morbus* was carried by the caravans to Orenburg. In fact, when he left this place the disease did not prevail

there, yet nearly four months had elapsed since the arrival of the caravans. The plains of the Kirgheez, which these caravans had traversed, were uninfected by the disease. It was not impossible that the *cholera* might have been brought from Samarcand by individual travellers; but this idea had never occurred to any person at Orenburg, where the disease was considered to have been generated and developed fortuitously, under atmospheric influence, and not to have been imported."

In July, 1830, the disease appeared again in Astracan, and it is asserted by the reviewer that it was brought by a vessel from Baku, a town situated about three hundred and fifty miles from Astracan, down the Caspian; several of the crew having died on the voyage of the cholera. A sufficient answer to this is, that it is not pretended in the Russian official report, as published by Dr. Lichtenstædt, that the vessel ever went up to Astracan; on the contrary, it appears that she was put into quarantine sixty miles below, at a place called the Sedlitovski Lazaretto.

The reviewer says, "Once in possession of this point" (Astracan), "the disease found a ready inlet to the principal towns of the Russian empire; afforded by the navigation of the Wolga, Don and Donec, on the banks of which they are, for the most part, situated." He seems to have forgotten that the disease was at Astracan in 1823, but did not extend at that time beyond the limits of the place, though the same "great thoroughfares of the country" were as much open then as in 1830.

In the latter part of September it reached Moscow; and Dr. Walker, a contagionist, in an official report, addressed to the British government, dated April, 1831, observes,

"That a strict investigation had been made into what were reckoned the first four cases occurring in Moscow, and that it was proved that they had neither themselves been in any infected place, nor had any communication with any one coming from such place." He further says, "I am convinced of the contagious nature of the disease, but the proofs of its transmission from one individual to another are not quite perfect as yet." The cholera continued at Moscow till February, 1831, the whole number of cases being a few more than eight thousand, and the deaths about half that number.

Of its appearance at Warsaw we have already spoken. It broke out in Dantzic and Riga in May; Dr. Dalmas has proved that it was not imported into the former place, and the same has been shown in regard to the latter by the medical board of Riga.

The first case of the disease at St. Petersburg occurred in June. In the official reports published by the British Board of Health may be found a document signed by the medical and other officers of the police of St. Petersburg, acknowledging that they were unable to show "whence the disease originated." There is one fact, in relation to this epidemic at St. Petersburg, that has been supposed to favor the doctrine of contagion; it is communicated in a letter from Drs. Russell and Barry to the British government.

"A woman," say they, "had been sent out (of the city prison) some weeks before to be treated for a syphilitic complaint, in a public hospital. Her husband was also in confinement at the time, in a different part of the building, but remained. The woman was returned to jail on the 23d day of June, O. S., with a diarrhœa upon her. She

saw and embraced her husband for a moment, as she passed in to be placed in the room of observation. In a few hours she was seized with true cholera, and died that night. This was the very first case. The next persons attacked in the prison were the three women in the same room with the former, one of whom had rubbed the deceased. These three died — all within three days after the first. The next prisoner attacked was the husband of No. 1; he lived in a separate part of the jail. In short, of twenty-seven attacked (fifteen dead), there is but one to whom communication cannot be traced. He was confined for a capital offence, and had less liberty than the others."

Now, it should be considered that at this time the whole atmosphere of St. Petersburg, if our view of the subject be correct, was loaded with the infection of cholera, and it required only a predisposing cause to give it efficiency. The depressing affections of the mind, particularly grief and terror, are known to have a powerful influence in producing a predisposition for the disease; and when we add to these the kind of diet and mode of living which criminals of this class would be likely to have, we cannot well imagine persons more predisposed to take the disease than those who had it. Besides, the fact that one of the sick was confined for a capital offence, and was not known to have had any communication with the infected, affords the strongest presumptive evidence that the disease was taken from the atmosphere. It is absurd to suppose that this last prisoner could have had communication with any person without the knowledge of the superintendent of the establishment.

We will now finish our sketch of the progress of the

cholera. It appeared at Archangel in July, at Berlin in August, at Vienna in September, and at Hamburg in October, in spite of the most rigorous measures of quarantine that could be adopted. It seems idle to say that governments constituted like those of Russia, Prussia, and Austria, could not enforce a system of complete non-intercourse between their territories and those of the infected countries; and it is admitted by nearly all the contagionists, after the most rigid scrutiny, that there is no evidence that the disease was brought to any one of these places. We should trouble our readers with the proof of this in detail, if there were any considerable diversity of opinion on the subject.

It was thought, by many, that if the disease should reach Great Britain it would then be easy to decide the question as to its contagious character; as it was supposed to be impossible to bring it there by human agency, without the fact being known. And we confess that we were of that number. In the first place, Great Britain was an island, separated by a considerable extent of water from every place where the disease had been; and in the second place, the government, acting on the principle that it was contagious, had adopted a very strict system of quarantine. When, therefore, it broke out at Sunderland, as it did on the 26th of October, it was but fair to expect that the whole thing would be explained; that, if it were imported, we should be furnished with the name of the vessel that brought the unlucky patient, the place where he contracted the disease, and what was the exposure of the first person who had it in England. We thought that every minute particular would be stated officially, that had any bearing on the breaking out of the disease; and this would, no

doubt, have been done, as all the members of the British Board of Health are believers in contagion, if anything had occurred which favored that doctrine. But nothing of this kind has taken place. We had, to be sure, in the newspapers a story of a vessel from Hamburg passing up the river by Sunderland and returning, without communicating with the shore, and she, it was said, no doubt, introduced it; and then we were told that it was brought there by a chest of clothes of a seaman, who had died of it abroad. But all these are now given up, and we are totally in the dark, if we admit the doctrine of contagion, as to the way in which the cholera entered England.

As some may, perhaps, doubt the statement we have just made, we will give a short extract from a letter from Dr. J. Brown, dated Sunderland, November 10th, 1831; and which may be found in the *Medico-Chirurgical Review* for January, 1832.

"Need I examine," says he, "the question of its importation, and refute the story, circulated through the newspapers, of certain ships which lay above our bridge, and communicated the disease to the town? Those ships came from places where cholera did not exist at the time of their departure, — most of them from Holland, where it has not yet appeared; their crews were and had been in perfect health; and the disease *first* manifested itself in a part of the town *two miles distant from where they were lying*. If there have been other modes in which disease may have been communicated from the continent, I know not of them.

"The importation doctrine is here — where we must be supposed to be the most competent judges of a matter, not

of opinion, but of fact — so generally abandoned, that I shall bestow no more pains in its refutation."

There are some, to be sure, who say, that as Sunderland is one of the nearest towns in Britain to Hamburg, it might have been introduced by some person from that place by violating the quarantine; it will be time to consider this, when it is shown that such a violation has taken place.

The manner of its entering London, without passing through the intermediate country, though there was great and daily intercourse between Sunderland and all parts of the kingdom, is wholly inexplicable on the principle of contagion. And is not the fact of the appearance of the cholera in Paris still stronger against this doctrine? Here is a city situated nearly one hundred and fifty miles from the sea-coast, and about two hundred and fifty from any place where the disease had existed, suddenly becoming affected with it. It is not pretended that the first victims of it had in any way been exposed, nor that any persons laboring under the disease had arrived there. Where, then, could they have become infected?

It is well known that a quarantine has been established throughout France, and any one at all acquainted with the keen vigilance of the Paris police-officers will hardly believe it possible they could have been deceived. To us the true explanation appears to be, that in the course which this wonderful epidemic is appointed to run, it had arrived at Paris, and suddenly seized on those the state of whose systems rendered them peculiarly predisposed to it. This number at the present moment is greater than usual, from the embarrassment and interruption of the ordinary business of the city, and the consequent want of employment, with its attendant evils, of many of the

laboring class. This will acount for the fact that so many have already been destroyed by it there, and that its ravages have been chiefly among the lower order of the people.

Having considered the principal reasons that have been urged in favor of the contagious character of cholera, and attempted to show that the course of the disease, from its commencement to the present time, does not warrant the belief that it has been propagated by contagion, we shall present some positive evidence that it is completely a non-contagious disease.

1. The sudden disappearance of the disease in places which it has attacked, when a very small part of the population has been affected, and at a moment when great numbers are sick, and when free intercourse has been allowed with them, are facts hardly compatible with the doctrine of contagion. Two examples will be enough to illustrate this. In Moscow, with a population of between two and three hundred thousand, only eight thousand were attacked; and in St. Petersburg, containing more than three hundred thousand inhabitants, something less than eight thousand had the disease, and it suddenly ceased at a time when a large number were sick.

2. In almost all places from which we have a right to expect authentic accounts in Europe, we find that the cholera has been preceded by a great tendency to derangement of the stomach and bowels among the population generally, showing that there is what Sydenham called an epidemic constitution of the air. This was noticed in many places in Russia, Germany, and Great Britain. We refer for information on this subject to the very excellent letter of Dr. Brown, of Sunderland, from which we have already quoted.

3. During the prevalence of the cholera in a place, the brute animals have frequently been sick, and many of them have died. This is spoken of by Jameson, in the Bengal Report, as having been the case in the East Indies, and it has also been noticed in Russia, Germany, and Great Britain.

4. The exemption from the disease of places in the neighborhood of those affected by it, and between which constant and unrestrained intercourse has been kept up, is another consideration of some importance in favor of non-contagion. The following extract of a letter from the British consul at Cronstadt furnishes a strong example of this kind.

"The small village of Tolbuhin, containing a population of about one hundred and fifty inhabitants, and in daily communication with this place, as it supplies the town with milk and vegetables, has escaped the visitation entirely, and not one being, to this day, has fallen a sacrifice to the complaint, or had an attack; therefore, to them it has been neither epidemical nor infectious, though their manner of life is not in any way different from that of the inhabitants of this place."

5. In numerous instances, persons have gone out of infected places and become sick with the disease at a distance, without communicating it to any one else. In the twelfth volume of the London Medico-Chirurgical Transactions may be found a letter from Mr. Cormick, an English surgeon, dated Tabriz, in Persia, October, 1822, mentioning that the Prince of Persia left the city as the disease began to abate, yet from four to six of those who went with him were attacked daily for several days with cholera, "although not a single person of the villages

through which they passed, or where they slept, took the disease."

In the report of Dr. Albers to the Prussian government, from which we have before quoted, it is stated that "during the epidemic it is certain that about forty thousand inhabitants quitted Moscow, of whom a large number never performed quarantine. Notwithstanding this fact, *no case is on record of the cholera having been transferred from Moscow to other places*, and it is equally certain that in *no situation* appointed for quarantine has *any case* of cholera occurred.

6. Its appearance on board ships at anchor, when there is no cholera on the neighboring shores, is strong presumptive evidence against contagion. Mr. Nathaniel Grant, late surgeon in the East India Company's service, relates a case of this kind in the *London Medical and Physical Journal* for October, 1831. It occurred on board the Sir David Grant, lying at anchor off Sauger Island, Bengal, in July, 1822, at a time when "there was no cholera at Calcutta, nor anywhere in our neighborhood." It proved fatal to several of the crew.

7. The great degree of immunity from the disease enjoyed by the attendants on the sick, both in Asia and Europe, can hardly be explained on the doctrine of contagion. Mr. Jameson, in the Bengal Report, states that "from a medical list consisting of between two hundred and fifty and three hundred individuals, most of whom saw the disease largely, only three persons were attacked, and one death only occurred."

In the Madras Report it is stated that out of one hundred and one attendants at the hospital, of the Royals, one only was attacked with the disease.

At Bombay all the attendants of the hospital escaped, though they were with the sick both day and night.*

While the disease prevailed at Orenburg, two hundred and ninety-nine patients were admitted with it into the military hospital, and not one of the twenty-seven attendants took the disease. Some of the hospital servants were obliged to perform blood-lettings, apply leeches, poultices and frictions, and administer baths, so that they were compelled to be constantly breathing the exhalations from the bodies and clothes of the sick, as well as to touch and handle them; and yet not one of them had the cholera. Even the washerwomen of the hospital escaped. The editors of the *Edinburgh Medical and Surgical Journal*, who are believers in contagion, remark with great candor upon this statement, that "the immunity enjoyed by the officers and servants of the military hospital of Orenburg is surely sufficient to prove that *at this period of the epidemic* the disease could not propagate itself from the sick to the healthy."

The same immunity has been witnessed at other places, particularly at Moscow, as may be seen in Dr. Albers' Report. But it is needless to multiply instances of this kind.

What will be the future course of this pestilence, and whether it will probably reach our country, it is impossible to conjecture. Something may be hoped, from the wide-spread ocean over which it must pass, and which may possess the power to disarm it of its virulence; but we should rely with greater confidence on the superior comfort enjoyed by the great mass of our citizens, when compared with those of the other quarters of the globe, the abun-

* Kennedy, page 57.

dance of wholesome food within their reach, the superior convenience and cleanliness of the dwellings of the poor, and generally the absence of what have elsewhere been found the predisposing causes. Some consolation, too, may be derived from the fact that, though the number of deaths in proportion to the number attacked has been greater in Europe than in the East, the number attacked in proportion to the whole population has been comparatively small. This is, of course, owing to the fact that there is a less number of persons predisposed to it there than in the countries which it visited in Asia, and the number here would no doubt be still less.

We have taken some pains to satisfy our readers of the non-contagious character of cholera, because we think it a question of great importance, and one which it is very desirable to have correctly settled. We do not allude to quarantines, and all the vexatious, expensive and harassing embarrassments that grow out of them; we waive all considerations of a pecuniary nature, though they are by no means trifling. Restrictions on commerce, infinitely more severe than any that have ever been imposed, would be quietly submitted to, if the disease could be introduced by sea. But we refer to the distress that would be produced, should the cholera appear among us, if a belief in its contagious character were general.

The sick would be abandoned by all in the hour of distress. So strong is the law of self-preservation in the human breast, that but few, if any, would encounter the danger of administering to the wants of the dying. We fervently hope that the experiment is not to be tried upon us, and that Heaven will avert this calamity from our shores. But should it arrive, we feel confident that, how-

ever the mass of the community may be influenced in their treatment of the sick by the views they have taken of its contagion, the practitioners of the healing art will be true to the sacred cause of science and humanity, to which they have devoted their lives; and that, whatever difference there may be in their opinions on some points connected with the disease, they will all agree in laboring to mitigate its violence. If not operated on by higher motives, they should all bear in mind the immunity of those who have in other places faithfully watched over the dying, and recollect that the moral courage which prompts to this is one of the greatest safeguards against the disease. They should devote themselves, without fear, to aid and comfort them in the hour of peril; confident that, if their turn come next, it can never come at a better period than when they are engaged with zeal and fidelity in the discharge of their duty.

REMARKS

ON SOME OF THE MEDICINAL SPRINGS OF VIRGINIA.

READ BEFORE THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT, SEPT. 23, 1839.

The Medicinal Springs of Virginia are daily attracting more attention from invalids in all parts of our country. The number that resorts to them is annually increasing; and, while many reap advantage from the use of the waters, a few, from an ignorance, perhaps, of their powers, return disappointed, and without relief.

It is important that there should be correct information on this subject; that those only should undertake the journey who have a reasonable prospect of benefit; for it cannot be denied that, at present, it is attended with expense, fatigue and inconveniences of various kinds, that are very annoying to feeble and infirm persons.

With a view of contributing my mite to this desirable object, I have thrown together, though in some haste, the following remarks. They are the result, in part, of personal observation, made in a recent visit to the springs; but more of inquiry of those whom I met there. They may not be perfectly accurate in all respects, but I believe that they are essentially so, at least in all important particulars.

There are eight principal springs; and I propose to speak of four, which are among the most celebrated of the number, in the order in which I visited them.

Before doing this, it may, perhaps, be well to say something of the routes which lead to them. There are three principal ones from Baltimore; one by the way of Winchester, another by Washington, and a third by Richmond.

If you take the first, you are conveyed to Winchester, a distance of one hundred and ten miles, by railway, passing through Frederick in Maryland, and Harper's Ferry in Virginia; the road, in its whole extent, being through a fertile and interesting country. From Winchester you are conveyed in coaches, and the mail will carry you in two days to the warm springs; but if you prefer to take an extra carriage, you will not arrive there so soon by half a day, at least. From Winchester to Harrisonburg, seventy miles, the road, through the rich valley of the Shenandoah, is very rough; when that is completed, which is now constructing, — and this will, no doubt, be before the close of another year, — a more delightful route can hardly be imagined. The road from Harrisonburg to the springs is very good.

In going by the second route, you are carried to Washington by the railway, thence down the Potomac sixty miles to Potomac Creek, thence nine miles by coach to Fredericksburg, and thence to Louisa Court-house by railway, between eighty and ninety miles. Here you take the stage to Charlottesville, thirty-two miles, and thence to the Warm Springs, which may be reached in a day from Charlottesville. The travelling on this route is good, excepting the road between Louisa Court-house and Char-

lottesville, which is bad in wet weather, but very tolerable at other times.

The way by Richmond is, perhaps, at present, the least fatiguing of any. A steamboat conveys you to that city from Baltimore, and you are carried on a railway to Louisa Court-house; thence you pursue the same course as by the Fredericksburg road.

Going by either of these routes, the Warm Springs are the first that are reached. They are situated on the western side of a mountain of great height, called the Warm Spring Mountain, which is crossed by a road constructed with such skill that it is passed without fatigue or danger, though it winds along the edge of precipices of fearful height. The temperature of the water, at the Warm Springs, is ninety-six degrees at all the seasons of the year. It is so perfectly pellucid, that it is difficult to realize, when you first look into the spring, that there is any water there, the objects at the bottom are seen with so much distinctness. Bubbles of air are constantly rising to the surface, and these have been ascertained to be principally nitrogen, which, I believe, is by no means uncommon in sulphureous thermal springs. The water is not disagreeable to the taste; or, at least, it was not so to me, except from its temperature. It contains sulphur, magnesia, lime, and various other substances in minute proportions; but its virtues, I am inclined to think, are owing to its temperature rather than to any medicinal agents combined with it. The sulphur may, in some cases, have a good effect, for the water is so much impregnated with it as to partake strongly of its odor. The supply of water is very copious. It is received into a room thirty-eight feet in diameter, and is allowed to rise to a depth of five feet

when it is intended for the gentlemen to bathe, and four feet for the ladies. After it has been used, the water is drawn off, and the bath fills again in a quarter of an hour. The usual practice at the springs is to bathe twice, or even three times a day, and remain in the water about fifteen minutes each time. It is advised to avoid active exercise while in the bath, and to be rubbed with a coarse cloth immediately on coming out; which office I can say, from experience, is faithfully performed by a black attendant.

It is difficult to conceive of a more delightful bath; it is almost worth a journey to Virginia to enjoy it. It is not only agreeable at the time, but its effects are in a high degree pleasant, producing no lassitude, but rather imparting vigor to the system. It is usual to take the first bath at five o'clock in the morning; and it is then particularly grateful, for the temperature of the air at that hour, even in summer, is not much above fifty degrees.

These springs are principally resorted to by patients afflicted with rheumatism, gout and paralytic affections, though all classes of invalids who go to the Virginia watering-places usually pass a few days at the Warm Springs, if it be only to enjoy the delicious bathing. One patient, a highly-cultivated and intelligent man, derived great benefit, while I was there, from these baths. He was afflicted with the gout to a distressing degree, which was complicated also with an affection of the spine, producing a partial paralysis of the right hand. The effects at the time were perfectly wonderful, but whether they were permanent or not I am unable to say. He was relieved to a very considerable extent, not only of his lameness, but also of his pain, which at times had been very acute. He bathed constantly twice or three times a day, and re-

mained in the water half an hour each time. He frequently assured me, after bathing, that, instead of having any feeling of languor or debility, he was refreshed and invigorated by it.

The Warm Springs will, I doubt not, be found beneficial in most cases of debility in which there is no organic disease, though it is probable that much of the benefit which such patients derive from a visit to them should be set down to the pure mountain air which they enjoy, their entire change of diet, and total abstinence from stimulating liquors, for none of these are drank at the public tables at the watering-places in Virginia.

Five miles beyond the Warm Springs are situated the Hot Springs. They are six in number, varying from ninety-eight to one hundred and six degrees in temperature, which, like that of the Warm Springs, remains the same throughout the year. The water of the Hot Springs contains various substances, as iron, magnesia, soda and lime, carbonic acid gas, nitrogen, which is constantly escaping from it in bubbles, and a minute portion of sulphuretted hydrogen. When taken internally, it is said to act as a diuretic, diaphoretic, and a mild aperient. Whatever difference of opinion there may be as to the power which it is able to exert on the system when taken into the stomach, there can be no doubt of its salutary influence when judiciously used as an external remedy.

The mere fact that the articles which this water contains are not separately of a very powerful kind, is no proof that they may not be capable of acting with great energy on the system when combined in the laboratory of nature. It is well known to every one at all acquainted with chemical science, that compounds of a very dissimilar

character are produced by the combination of the same elements in different proportions, producing substances, in some instances, of far greater activity than either of the articles of which they are composed; and there is, perhaps, no better illustration of this than that offered by the union of oxygen and nitrogen, producing, when combined in one proportion, atmospheric air, nitrous oxide in another, and nitric acid in a third. Nor are we sure that we are able to detect all the ingredients which these waters contain. The very tests which reveal some of them to us may have the power of destroying others; and these, too, may be those in which the medicinal properties reside. The remediate properties, then, of mineral waters, cannot be determined with any certainty by an analysis, however nicely conducted, but must be ascertained by experience; and this speaks well for those of the waters of the Hot Springs.

They have been found, when taken in combination with the bath, of great use in gout, rheumatism, neuralgic affections, functional diseases of the liver, debility of various kinds, especially that connected with and consequent on a derangement of the digestive organs. These springs are owned by Dr. Goode, a very intelligent physician, under whose direction the baths are conducted. By this means, the sweating bath, a remedy of great power, is administered in many instances with the happiest effects, and in all with perfect safety.

The temperature both of the Warm and the Hot Springs, as I have already observed, is uniform at all seasons; and in relation to this point, when speaking of some of the thermal waters of Europe, Professor Daubeny remarks, that "we may be authorized, on general grounds,

to presume that the temperature of thermal springs, in countries not exposed to present volcanic operations, undergoes no sensible change during a long period of time." It is well known that an earthquake or an eruption of a volcano has often produced a change in the temperature of thermal springs that were even at some distance from the place where these phenomena occurred.

It is, perhaps, not easy to account for the high temperature of the water of thermal springs. By some it has been attributed to the agency of electricity. But this is rather a wild conjecture, than the result of any facts or observations. Various phenomena are regarded on very slight grounds as electrical, partly because we are unable to explain them, and partly because we do not know all the laws of electricity, while at the same time we have ample evidence that it is an agent of tremendous power. Whatever the fact may be, it is certain that there is no proof that it is in any way concerned in the production of the high temperature of thermal waters.

Another theory supposes that the heat of these springs is produced by certain chemical processes going on in the interior of the earth, and that these processes are attended with an absorption of oxygen, and a consequent extrication of caloric. While another opinion maintains that the temperature of thermal springs is owing to the central heat of the globe, and that it increases in proportion to the depth from which they proceed. This opinion was supported by Laplace, and is, perhaps, more generally adopted at the present day by scientific men than any other. It is well known* that the temperature of the

* See a paper by Professor Daubeny, in the Sixth Report of the British Association for the Advancement of Science.

earth increases, as we descend into it, about one degree for every hundred feet; and, if the increase continues in this proportion, we should arrive at boiling water at a depth of less than three miles.

I am not, however, conversant enough with this subject to offer an opinion on the comparative merits of these theories. It is a point which falls within the province of geology, and the zeal and success with which that science is now pursued may lead us to expect some elucidation of this intricate topic.

The most celebrated of all the Virginia springs, and probably the most powerful, is the White Sulphur, which is thirty-five miles beyond the Hot Springs, and six miles west of the Alleghany Mountains. Though situated in a valley, it is, like all the springs in that neighborhood, in an elevated position, with a delightful climate in summer, and surrounded with mountainous scenery of great beauty. Independently of the benefit that may be derived from the medicinal waters, a better situation for an invalid during the hot season can hardly be imagined. It has the advantage of a salubrious and invigorating air, an agreeable temperature, cool at morning and evening, — the thermometer ranging at those periods, during the summer, between fifty and sixty degrees, and rarely attaining a greater height than eighty degrees at any part of the day, — and an elasticity in the atmosphere that prevents the heat from being at any time oppressive, and enables the invalid to take active exercise in the open air during the day without fatigue.

This spring was known soon after the settlement of that part of the country, which took place about seventy years since. It is said to have been a favorite Moose Lick, and

that hunters resorted to it in pursuit of this animal. In this way its medicinal properties first became known; but, in consequence of the thinness of the population and the badness of the roads, it has not till within a few years been much frequented.

Though the odor and taste of the water, from its being strongly impregnated with sulphur, are disagreeable to most persons on first using it, I noticed that the dogs, that are kept in great numbers at the springs for the purpose of hunting, seemed to be very partial to it. I was scarcely ever at the spring that I did not see one or more of these animals lapping the water with great apparent relish as it flowed from it.

The water, of which there is an abundant supply, is at a temperature of sixty degrees throughout the year. It is very transparent, and slightly sparkling, from the gases which it contains; these are sulphuretted hydrogen, carbonic acid gas, nitrogen, and oxygen. Bubbles of air, principally nitrogen, are constantly rising to the surface of the water and escaping from it, in the same way as in the Warm and Hot Springs. Its other contents are lime, magnesia, soda, iron, organic matter, and precipitated sulphur. This latter ingredient seems to be very abundant, and a copious deposit of it may be seen at all times at the bottom of the spring, though it is usually cleaned out every few days. From the white appearance of this deposit the spring takes its name.

The water of the White Sulphur Spring no doubt possesses medicinal properties of great power. Multitudes who resort to it annually are benefited by its use, while a few, perhaps, deriving no advantage, are inclined to believe that the water has no remediate powers. But it should

be recollected that these waters are not calculated to relieve all cases, and that in those where they might be useful they may prove mischievous if not judiciously taken. Many persons, immediately on arriving at the springs, drink the water immoderately, and not a few suffer for their rashness. When taken in this way it is said to produce a powerful determination of blood to the head, attended with pain and dizziness, and sometimes followed by severe cerebral symptoms.

Though this water is nauseous to most persons on first drinking it, a relish for it is soon acquired, and in a short time, in most instances, it becomes a favorite beverage. I met with several individuals, in perfect health, who declared to me that they preferred it to any other liquor, and drank it merely as a luxury.

It is said to act on the kidneys, the bowels, the liver, and the skin. As a diuretic, its effects are very soon apparent, but it usually requires some days before it produces a decided action of the bowels. Its operation on the liver, too, is not manifest for some time, and where there is a great torpor of this organ some auxiliary means may at first be required. Its effect on the skin is very apparent, though not immediate; after drinking the water a few weeks the perspiration becomes strongly impregnated with sulphur.

The use of this water is no doubt beneficial in a variety of affections; and I am inclined to believe that it will be found signally useful in those functional derangements of the digestive organs, which are so common, and at the same time so unmanageable, especially when they are connected with disturbance of the liver, or a torpid state of the bowels. The whole tribe of dyspeptics, if their

trouble be not the effect of organic disease, may resort, with a well-grounded expectation of relief, to these healing waters.

Another numerous class of patients, known under the very common but not very significant name of bilious, is said to find, very often, relief from them. Many persons of this description come to the springs from the south and south-west, whose constitutions have been shattered by the diseases incident to the climate, and they almost invariably derive benefit from a residence there. In such individuals there is, hardly without exception, some derangement of the biliary secretion, consequent very often on intermittents and other fevers of the country.

Chronic rheumatism is a disease from which relief is, in very many instances, obtained by a resort to this spring. In this case great advantage is derived from the external as well as internal use of the waters; and for this purpose an excellent bathing-house has this year been erected, with every convenience for using the bath in every form, and at any temperature that may be desired.

Cutaneous eruptions of various kinds are frequently removed by a similar management.

Many of the distressing symptoms, which are by no means the unusual attendants of chronic affections of the urinary organs, are in many cases alleviated, and in some entirely removed, by a judicious use of the White Sulphur Water.

There are other maladies over which, it is said, it exerts a favorable control. But it is unnecessary to enumerate them, partly because I cannot speak from personal knowledge, and partly because I suspect that in some of them the advocates of the springs may have exaggerated the virtues of the water.

But of this much I feel confident, that these springs will, in a majority of cases, be useful not only in those diseases which I have named, but also to that numerous class of patients who are affected with debility connected with functional derangement, or that which is consequent on previous disease, or excess and imprudence in living. All persons who resort to the White Sulphur Spring for the purpose of health would do well to consult Dr. Moorman, the resident physician, who is well qualified to advise as to the mode of using the waters, and the cases to which they are adapted. They will find him to be an intelligent and well-educated physician.

The Sweet Springs are seventeen miles from the White Sulphur by the road, but not more than half that distance in a straight line, as the road winds gradually over the mountains, and thus avoids the steep and precipitous ascents which would be unavoidable if it crossed them in the nearest direction. The temperature of the water is seventy-six degrees, and is the same at all seasons. It is very abundant, and is situated in one of the most beautiful mountain valleys of that region. It contains a large quantity of gas, particularly the carbonic acid gas, and this imparts to it a sparkling and agreeable taste. In what way it obtained the name of sweet, I cannot learn; it certainly does not deserve it, for it is decidedly acidulous. It contains lime, magnesia, soda, iron, etc., but in what quantities I do not know. An analysis of all these waters has recently been made by Professor Rogers, of the University of Virginia; and it is understood that the result of his investigations will soon be given to the public.

The water of the Sweet Springs, when taken internally,

is not supposed to possess medicinal properties equal to those of some of the other springs; but in combination with the bath it is found useful in many diseases, as rheumatism, paralytic affections, and general debility. It has also been extolled in dyspepsia, and in that countless tribe of maladies which follow in its train. It is certainly a very agreeable bath, pleasant while you are in it, and followed by a delightful glow as soon as you come out.

There are four other springs, of greater or less degree of celebrity, which I did not visit; these are the Blue, Salt, Gray, and Red Sulphur. The first two are said to resemble very closely the White Sulphur, having the same properties, though in less degree. The Gray Sulphur has been extolled for dyspeptic affections, and the Red Sulphur for its beneficial effects in pulmonary diseases. But, having no personal knowledge of any of them, I do not feel that I could offer anything that would be worth your attention.

By the kindness of my friend Prof. Wm. B. Rogers, late of the University of Virginia, I am enabled to give an analysis of the waters of the springs mentioned in the preceding article. His great scientific attainments, and acknowledged reputation, as well in Europe as this country, make it unnecessary for me to say that entire confidence may be placed in its accuracy.

March, 1855.

WARM SPRINGS.

PRINCIPAL BATH. — Temperature of the spring generally, ninety-six degrees; of the principal stream as it enters, ninety-seven and a half degrees.

Quantity of each solid ingredient in one hundred cubic inches, estimated as perfectly free from water:

Sulphate of lime, ... 5.123
Sulphate of magnesia, ... 0.452
Sulphate of soda and potassa, ... 0.180
Carbonate of lime, ... 2.098
Carbonate of magnesia, ... 0.694
Chloride of sodium, with traces of chlorides of magnesium and calcium, ... 0.072
Organic matter, perhaps crenic acid.
Silica.
Oxide of iron, united in part with the organic matter.

Volume of each of the gases contained in one hundred cubic inches of water:

Carbonic acid, ... 2.64 cubic inches.
Nitrogen, ... 1.62 "
Hydro-sulphuric acid, ... 0.19 "

Composition of one hundred cubic inches of the mixed gas which rises in bubbles through the spring:

Nitrogen, ... 98.8 cubic inches.
Carbonic acid, ... 1.2 "
Hydro-sulphuric acid, ... a trace.
Oxygen, ... a trace.

HOT SPRINGS.

Boiler Bath. — Temperature, one hundred and six degrees.

Quantity of each solid ingredient in one hundred cubic inches, estimated as perfectly free from water:

Carbonate of lime, ... 6.557 grains.
Carbonate of magnesia, ... 1.153 "
Sulphate of lime, ... 1.750 "
Sulphate of magnesia . . . . . 0.890 "

Sulphate of soda, ... 1.437 grains.
Chloride of sodium, with traces of chloride of magnesium and calcium, ... 0.570 "
Per-oxide of iron from carbonate, and probable crenate, ... 0.120 "
Silica, ... 0.703 "
Organic matter.

Volume of each of the gases contained in one hundred cubic inches of the water:

Carbonic acid, ... 11.01 cubic inches.
Nitrogen, ... 1.79 "
Oxygen, ... 0.22 "
Hydro-sulphuric acid.

Composition of the mixed gas which rises in bubbles through the spring, in one hundred cubic inches:

Nitrogen, ... 84.8 cubic inches.
Carbonic acid, ... 10.2 "
Oxygen, ... 5.0 "

WHITE SULPHUR SPRING.

The temperature of this spring, although varying with the season, is always many degrees higher than the mean temperature of the place. It ranges from about sixty to sixty-five degrees, Fahrenheit, and is the only *thermal* spring among the decidedly sulphurous waters of Virginia.

One hundred cubic inches of the water contain the following solid ingredients, all of which, excepting the organic matter, are estimated as perfectly free from water:

Sulphate of lime, ... 31.680 grains.
Sulphate of magnesia, ... 8.241 "
Sulphate of soda, ... 4.050 "
Carbonate of lime, ... 1.530 "
Carbonate of magnesia, ... 0.506 "

Chloride of magnesium,	0.071 grains.
Chloride of calcium,	0.018 "
Chloride of sodium,	0.226 "
Proto-sulphate of iron,	0.069 "
Sulphate of alumina,	0.012 "
Nitrogenous organic matter, with a large proportion of sulphur,	5 to 6 "
Silica.	
Earthy phosphate.	
Iodine and bromine.	

One hundred cubic inches of the water contain of gases the following volumes:

Hydro-sulphuric acid,	0.66 to 1.30 cubic inches.
Carbonic acid,	3.67 "
Nitrogen,	1.88 "
Oxygen,	0.19 "

SWEET SPRINGS.

Drinking Spring near the Hotel. — Temperature, seventy-four degrees.

Quantity of each solid ingredient in one hundred cubic inches, estimated as perfectly free from water:

Carbonate of lime,	13.013 grains.
Carbonate of magnesia,	0.357 "
Sulphate of lime,	5.703 "
Sulphate of magnesia,	4.067 "
Sulphate of soda,	2.740 "
Chloride of calcium,	0.065 "
Chloride of magnesium,	0.136 "
Chloride of sodium,	0.060 "
Per-oxide of iron; from carbonate, and probably crenate,	0.165 "
Silica,	0.075 "
Organic matter, chiefly combined with the oxide of iron,	amount undetermined.

Earthy phosphate, ... a trace.
Iodine, ... a trace.

Volume of each of the gases contained in one hundred cubic inches of the water:

Carbonic acid, ... 37.17 cubic inches.
Nitrogen, ... 1.86 "
Oxygen, ... a trace.
Hydro-sulphuric acid, ... a trace.

The contents of the mixed gas which boils up copiously through the spring is, in one hundred cubic inches,

Nitrogen, ... 71.7 cubic inches.
Carbonic acid, ... 28.3 "

LECTURE

ON SOME OF THE DISEASES OF A LITERARY LIFE.

DELIVERED BEFORE THE AMERICAN INSTITUTE OF INSTRUCTION, AUGUST, 1832.

THE subject of education is of the deepest importance to our countrymen. The government under which we live is strictly a government of popular opinion; and if great and untiring efforts be not made to keep the public mind duly enlightened, all our valuable institutions will be swept away. If our citizens should become indifferent to the cause of popular education, the tone of public morals would be lowered, the reverence for religion would decay, and our country would soon be distracted with lawless anarchy, or fall an easy prey to some ambitious and popular leader. No one, therefore, who loves his country, and duly appreciates the inestimable privileges we now enjoy, can be indifferent on this point.

The deep interest which I feel in the subject, and my readiness to coöperate with you in this great cause, have induced me to accept the invitation with which I have been honored by your committee; at the same time I can declare, with the utmost sincerity, that it is with extreme diffidence that I appear in this place on this occasion. No one will be surprised at this, who calls to mind the

learning and acquirements of the two individuals* who have addressed you on the former occasions on physical education, the character of the audience before whom I appear, and the extent and importance of the topic on which I am to speak.

But I have yielded my own opinion to that of others whom I am accustomed to respect, and have been induced to comply with the request to offer some observations on physical education, because I was anxious to show the interest I felt in your institution, though I was at the same time confident that there were many others better qualified for the task.

It has been truly said that man is the creature of education. His moral, intellectual, and physical powers are all susceptible of a high degree of improvement. At birth he is the most feeble and helpless of animals, and at a period when the lower orders of the creation, by the development of their bodily powers and that peculiar faculty which we call instinct, are enabled to provide for their wants, man is dependent on those around him; but, by a proper cultivation of his faculties, he becomes associated with a higher order of beings. It is the province of others to speak of his moral and intellectual culture; my remarks will be confined to his physical education, and I shall occupy the time allotted to me in saying something of those diseases of the body which are the most likely to be induced by the exertion of the intellectual faculties. I wish not to have it understood that any diseases necessarily follow the cultivation of the mind; on the contrary, I am convinced that this cultivation, if judiciously managed,

* John C. Warren, M.D., and James Jackson, M.D.

promotes the health of the body. But it cannot be concealed that, in our country at least, literary men rarely attain a great age, and that not unfrequently during the greater part of their lives they are subjected to severe and distressing disease. This is not a necessary consequence of their pursuits; there must, therefore, be either no regard to system in their mode of life, or there must be some radical error in the system which they adopt.

I shall, probably, be better understood in what I am going to say, if I offer a few general explanations in relation to the animal economy. The human body is composed of many distinct parts, which are destined to perform functions all of which are more or less important to the preservation of life, and which have an intimate relation with and dependence on each other. These parts are called systems; a few of which I shall briefly notice.

One of the most important is the *nervous system*. This is composed of the brain, the spinal marrow, and the nerves. The brain occupies the whole cavity of the skull; the spinal marrow, which is a continuation of the brain, is situated in a canal in the spinal column; and the nerves go out from the brain and the spinal marrow to all parts of the body. The brain is the seat of perception, and the nerves are the agents by which it is connected with external objects. How this communication is effected is totally inexplicable; but physiology abounds with theories sufficiently wild and visionary on this subject. Our business is only with facts. The nerves have not all the same functions. Some are nerves of sense, others of sensation, others again of motion, and another class is destined to endow particular organs with the power of executing certain functions. The nerves of sense, with

the exception of those of feeling, which are spread throughout the body, arise from the brain, and are carefully protected from injury by passing through bony canals. But though these nerves are exquisitely sensible to their own peculiar stimulus, as the optic nerve to light, &c., they have not the power of imparting motion or ordinary sensibility to the organs to which they are distributed. If the gustatory nerve should be divided, the tongue would retain its power of motion and sensation, though the sense of taste would be lost; and it is well known that all the motions of the eye are independent of the optic nerve, and in a recent surgical operation, in which I had occasion to divide that nerve itself, the patient afterwards informed me that it gave him no severe or peculiar pain.

There are no less than twelve pairs of nerves sent off from the brain, and thirty pairs from the spinal marrow. Those of the brain are distributed to the organs of sense, respiration, and digestion; and two small nervous filaments go out from this organ, which seem to be the rudiment of a system of nerves which supplies nearly all those organs over whose action the will has no control.

The brain is evidently the instrument of the mind, and its derangement is followed by a disturbance of the intellectual faculties. If its functions are interrupted, either by injury done directly to the brain or through the medium of the nerves, the mind ceases to act. A slight compression, or a powerful jar, is frequently sufficient to suspend for a time the operations of the mental powers. So dependent are these powers on the organization of the brain for their healthy exercise, that many have supposed that the mind was nothing but matter exquisitely organized; and it seems to be on this foundation that has been

reared the whole superstructure of what is familiarly known under the name of Phrenology. The teachers of this doctrine, as far as I understand them, maintain not only that the brain is the seat of the mind, but that the intellectual faculties, the moral powers, and the animal propensities, reside in different parts of it; and that these parts are more or less developed in proportion to the degree in which these properties are enjoyed by individuals, with a corresponding development of the skull; and that it is easy to discover, by an examination of the skull, the extent to which these properties are possessed. The intellectual faculties are said to reside in the fore part of the brain, the moral powers are placed in the upper part of the centre, and the animal propensities at the base. And then we have charts of the skull on which are marked the precise situation of each of the various faculties and powers, though it must be confessed that the professors have not till of late been agreed as to the exact spot in which these different faculties reside.

Too many distinguished men, however, have been the advocates of phrenology, to allow me to speak lightly of it. But if it be maintained that mind is the result of organization, and that its various faculties and powers are placed in different parts of the brain, which are exclusively assigned to them, I must say that the doctrine is not only fraught with dangerous consequences, but that it is at variance with facts familiar to almost every physician.

A belief that the intellectual character of men can be determined by an examination of the skull will often lead to very erroneous and unjust conclusions, and may tend to discourage individuals, who may not happen to possess the external characters of great mental powers, from all

efforts at improvement. But this would not be a substantial objection, if the theory were well founded. Is the brain anything more than the instrument by which the mind operates? We know that the brain may be wounded, extensively lacerated, and large portions of it, amounting to a quarter of the whole, actually removed, without impairing in a great degree the intellectual faculties. Abscesses and tumors of large size have often been found in the brains of individuals after death, who retained during life the full possession of their mental powers.

It has not unfrequently happened, in wounds of the head, that the very organs of certain faculties, according to the phrenological system, have been removed, without impairing these faculties.

Though the mind is affected in most diseases of the brain, it does not necessarily decay with the decay of the body. It is not unfrequent, a few hours before dissolution, when the tongue is hardly able to give utterance, and the whole animal frame is wasted and worn out, to witness displays of intellectual power that would astonish at any time. The mind, acting with more freedom, soars higher, as if in anticipation of the disenthralled state on which it is about to enter.

It is true that the brain is the instrument by which the mind operates; and the more perfect the instrument, the more perfect will be the mental operations. But we know not in what this perfection consists. It cannot be in the mere size of the organ, as is frequently supposed; for this is contradicted by what we see in other animals. Nor is it in its resemblance to the human brain; for some of those animals in whom this organ resembles that of man most closely, are surpassed in sagacity by others in whom the

resemblance is much less complete. We had better admit, then, with Buffon, that "the soul, thought and speech, do not depend on the form or the organization of the body." It may be thought humiliating by some to acknowledge our ignorance, but it is better to do this than to fall into dangerous error.

I have, however, already digressed too long to pursue this subject further; and I will now proceed to notice some other parts of the animal economy, which are important, both from their connection with the vital functions and their liability to disease.

Among these the digestive apparatus holds an important place. The food during mastication becomes intimately mixed with the saliva, and is then conveyed by a powerful muscular action into the stomach. It is brought in this organ, by the agency chiefly of the gastric juice, a peculiar fluid which is secreted by the stomach, into a homogeneous mass. As soon as this mass enters the first intestine it comes in contact with a set of absorbent vessels, which, from the milky appearance of the fluid they contain, are called lacteals. These vessels take up all that part which is adapted to nourish the body; they then unite in a common trunk, which conveys this nutritious fluid into the blood-vessels. But this fluid is not yet sufficiently assimilated to the blood to form a part of the circulating fluid, which is destined to convey nourishment to the whole body. How this purpose is effected will be seen by attending to the circulating and respiratory functions. The fluid received from the lacteals is poured into a vein, and is thence carried to the right side of the heart. In man the heart is a double organ, each part of which is the centre of a distinct circulation. That of the right side circulates

the dark-colored blood, which is returned by the veins from all parts of the body, after having parted with a portion of its nutritive principles; and with this blood, just before it enters the heart, is mixed the fluid which is furnished by digestion. This dark-colored blood is sent by the right side of the heart to the lungs, and it there undergoes a change, either by parting with some noxious principle which it contains, or by absorbing something from the air, and it then becomes of a bright scarlet color. It is then returned to the left side of the heart by what are called the pulmonary veins, adapted to all the purposes of life, provided the lungs be in a healthy state.

The instant it enters the left side of the heart, it is sent by that organ with great force through the arteries to all parts of the body. It has been calculated that two ounces of blood are thrown out at each contraction of the heart; and as there are about seventy of these in a minute, nearly ten pounds of blood must consequently pass through the heart in that time; and as the whole blood in a male adult is estimated at twenty-five pounds, it follows that the whole blood of the body is circulated in less than three minutes. This action of the heart continues during life; it cannot cease for a moment without producing death; so necessary is the stimulus of the red blood for the support of the vital functions.

The heart does not move with the same rapidity at all periods of life. In infancy its pulsations are more than one hundred in a minute; these gradually become less frequent, till in old age they rarely exceed sixty. During the early periods of life the body is continually increasing, and the circulation is more rapid to supply the demands which are made by the growth of the various organs.

A principle of decay seems to be implanted in the structure of the animal machine at birth. The circulating system, which is so essential to the continuance of life, is from its very activity doomed to destruction. So long as all the systems act in perfect harmony, the circulation goes on well; but the least interruption in one is sure to produce embarrassment in the others. In the early periods of life this is not sensibly felt, because the machine can at that time accommodate itself to great irregularities; but as we advance in age the case is different. If the respiratory or digestive functions are disturbed, the circulation labors, the blood accumulates in some organs or vessels, producing immediately serious effects, or laying the foundation for incurable disease.

But, even without this, the heart and arteries cannot carry on the circulation for any length of time beyond the term of years usually allotted to man. The brain becomes gradually less sensible, the nervous energy is of course diminished, the heart consequently acts with less power in distributing the blood, and nutrition is less perfectly performed. The valves of the heart and the great vessels become thickened, and finally converted into a bony substance, and the vessels themselves lose their strength and power of resistance. The circulation is languid and carried on with great labor, nutrition in the different parts is not perfectly effected, and the whole functions of the animal body finally cease, without the occurrence of any disease. We see, then, in what light we should regard the pretensions of those who boast of discoveries which will confer perpetual youth and immortality on man's bodily frame. Should not the strong marks of dissolution which are impressed on it by its

Creator, and the evidence which we have of the imperishable nature of the human mind, rather teach us to consider the present state as the beginning only of existence?

The functions of respiration are intimately connected with those of the circulation. These are performed by the windpipe and the lungs. The lungs are large organs, divided into three parts or lobes on the right side and into two on the left, and occupy the principal part of the cavity of the chest. They are composed almost entirely of air tubes and cells, and blood-vessels. The blood in an impure state is brought from the right side of the heart, and distributed in numberless vessels throughout the lungs. In the act of inspiration the air is brought into the air-cells, and the blood is separated from the air by a delicate membrane only. The blood in health is immediately changed in color and properties, though it is not determined precisely how this change is effected, or in what it consists. The air we breathe is composed of two different constituent principles, with a small mixture of a third. Soon after this discovery was made, — and it is of modern date, — it was thought that in the process of respiration the blood absorbed the oxygen or vital part of the air, and hence this red blood received the name of oxygenated blood. It is very certain that the air thrown out from the lungs is very different from that which is taken in, containing a much greater quantity of fixed air, or carbonic acid gas. Some chemists have undertaken to show that all the oxygen which is taken from the atmospheric air in respiration is no more than what is contained in the fixed air which is discharged by the lungs, and that this air is formed in the process of respiration by the union of the oxygen of the air and the carbon which is

given off by the blood in a volatile state. They assert, therefore, that the blood in respiration does not absorb oxygen from the air, but that it parts with a portion of its carbon; and that it would be more proper to say that in this process the blood is decarbonized, and not that it is oxygenated.

Without stopping to discuss the comparative merits of these theories, it must be acknowledged that the change produced in the blood in its passage through the lungs is essential to life. If it be completely suspended, even for a moment, death follows. When the air is prevented from entering the lungs, the circulation continues in them, but the blood undergoes no change, and is returned to the heart with the same color and qualities as before it entered the lungs. The instant this black blood is thrown by the left side of the heart to the brain, life ceases. Hence we understand the manner in which death is produced in drowning, hanging, and in entering places in which the air is unfit for respiration, as in wells and cisterns. In these cases death is not instantaneous, because some air finds access to the lungs; but in some cases of hanging life is destroyed by a fracture of the spine, and a consequent pressure on the spinal marrow. The Turkish punishment by the bow-string, which consists in drawing a cord so tightly around the wind-pipe as completely to prevent the entrance of the air to the lungs, produces instantaneous death.

It is evident, I trust, from what has been said, that the functions of the brain, stomach, heart and lungs, are essential to life; and it follows that when they are deranged, or imperfectly performed, disease is the consequence. It is true, also, that they are the organs which are in most cases primarily affected in the disorders of literary men.

In speaking of the diseases most likely to occur in connection with a cultivation of the intellectual faculties, the only order which I shall observe will be that of time; that is, I shall describe them in the different periods in which they are the most liable to occur. Till the body has attained its full size, all its powers seem to be directed to its nutrition and growth. These powers bear a different relation, therefore, to each other, at the different periods of life. Before the adult age, all the nutritive powers are in excess; the brain and nervous system, which give energy to the whole, are more developed in proportion in the child than in after life; and in consequence children are more liable to affections of the brain and nerves. Even cutting the teeth or overloading the stomach will not unfrequently produce in them violent and sometimes fatal convulsions, and there is a strong tendency in many of the diseases of childhood to terminate in dropsy of the brain. These facts should teach us that the minds of children should be gradually developed, and that there is danger that the brain will suffer if they are early excited to action. Epilepsy, and other affections of the brain, are known to be often the melancholy attendants on precocious childhood. The minds of children, under ordinary circumstances, are developed spontaneously at a period as early as is consistent with health; and it may well be doubted whether the premature display of intellect, which is sometimes witnessed in them, can compensate for the hazard which must necessarily accompany it.

A derangement of the digestive functions, in some of its forms, is among the most frequent and troublesome diseases which afflict literary men. It is most likely to occur between the ages of fifteen and thirty-five, though no period

of life is wholly exempt from it. There is, as we have already seen, a direct connection by means of nerves between the brain and the stomach; and we know that a blow on the head is often followed by vomiting, and that a disordered stomach usually produces pain in the head. Various affections of the mind have a powerful influence over the digestive functions. Grief will not only destroy, for a time, the appetite for food, but will also interrupt and suspend the power of digesting it.

Under the name of Indigestion, or the more popular one of Dyspepsia, is included a great variety of morbid affections, which all agree in one particular, namely, that the stomach, whatever may be the cause, does not readily and with ease digest the food taken into it. This sometimes proceeds from the state of the brain, at others from that of the muscular coat of the stomach; at one time the secretion by which digestion is effected is imperfect, deficient in quantity, or of a quality not adapted to the purpose for which it was intended. It not unfrequently happens that the lining-coat of the stomach is in a state of low inflammation, which sometimes terminates in serious and incurable affections of the organ; and again all the symptoms of dyspepsia may arise from a disordered state of the liver, which acts sympathetically on the stomach. If this view of the subject be correct, it must be perceived that the same means cannot be adapted to all cases of dyspepsia, and that those who pretend that they possess a remedy suited to every individual laboring under the disease must either deceive themselves or be willing to deceive others. It is not necessary to be acquainted with medical science to know that what would be beneficial in inflammation would do mischief in debility and want of action.

But though this enfeebled state of the stomach is often an attendant on a literary life, it is by no means a necessary consequence of it. Few men, certainly, in this country, are injured by too much study; there are none among us who devote more hours to mental labor than is compatible with health. The difficulty arises rather from a sudden change of habits, and a neglect of those means which are essential to a sound state of the body. Our students, the moment they become so, are too apt to abandon exercise; confine themselves too long in hot and perhaps ill-ventilated apartments; place no restraint on their appetite for food, which is usually as great in those who lead a sedentary life as in those who labor daily many hours in the open air; and, in addition to all this, indulge themselves not unfrequently both in smoking and chewing tobacco; and then, if the stomach should flag and seem unable to accomplish the task that is required of it, the whole difficulty is referred to studious habits and mental labor, while all the other circumstances which have been named, and which no doubt are the real cause, are entirely overlooked.

Another trouble, and one which is intimately connected with the derangements of which I have just been speaking, is frequently met with in professional men; I allude to a disturbance in the functions of the liver. This most frequently occurs in those individuals who, in addition to intellectual labor, are in situations of great responsibility; and the disease is, perhaps, more often seen among the clergy than any other class of society.

The liver, whose office it is to secrete the bile, is the largest gland in the body. But, unlike other glands, it is not supplied with the arterial or pure blood for this secre-

tion; on the contrary, the bile is secreted from the venous or dark-colored blood, which is returning to the heart for the purpose of undergoing the change which is effected in it by the lungs. One of the objects of this secretion, therefore, seems to be to rid the blood of a portion of its impurity, and the bile may be regarded as an excrementitious fluid. If the liver fail to perform its office, or if there be any obstruction in the passage of the bile to the intestines, the blood is impure, and the effect of this is felt by no part of the system more sensibly than the brain; and it is, perhaps, fair to conclude that the brain may have some influence in producing this state of the liver. At any rate, we know that in all those morbid affections which arise from a disordered state of the liver, whether it be only a derangement of its functions, or whether the organ itself be actually diseased, the mind is sensibly affected. This remarkable sympathy did not escape the observation of the ancients; they attributed nearly all cases of mental disease to a derangement of the abdominal organs, and the term which is employed to denote one species of this disease — melancholy — is derived from two Greek words, meaning black bile.

This disordered state of the liver is usually attended with a torpid state of the whole alimentary canal, a great depression of spirits, a general lassitude, and an indisposition to bodily and mental effort. It must be overcome at an early period, or it will prove almost unmanageable. It sometimes requires great sacrifices on the part of the patient for its removal. Change of scene, change of habit, change of diet, and sometimes even change of occupation, must be made before it can be cured.

The next in frequency to the diseases of the digestive

organs are those of the lungs, and they are unfortunately for the most part of a more severe and alarming character. Though the respiratory apparatus is often deranged, the only wonder, with those who are acquainted with its structure and functions, is, that it is able to keep in order as long as it does. The lungs are of the most delicate organization, composed almost entirely of air vessels and cells and blood-vessels, and covered by a membrane of the finest and most attenuated texture; and this membrane is every moment of our lives in contact with the atmospheric air, which is not unfrequently loaded with foreign substances of a highly acrid and deleterious nature. Hence, the lungs are oftentimes disturbed and irritated; but if the rest of the system be healthy, the equilibrium is soon restored, and the organs regain their wonted activity. If, on the other hand, the functions of the other parts are imperfectly performed, if there be a general torpor and want of action throughout the system, an accumulation of blood takes place in the respiratory organs, and it sometimes lays the foundation for incurable disease, though it is frequently thrown off by that conservative principle which seems to preside over the animal economy. But if, instead of being removed by the efforts of nature or the interference of art, this derangement is suffered to continue, it increases on every slight occasion, till a violent hemorrhage ensues to relieve the crowded organs. And this bleeding at the lungs is one of the most common diseases of literary men. Their habits of life are well calculated to produce this. Their want of active exercise, which prevents the circulation from having that vigor so essential to its well-being; their long confinement in close rooms, breathing an atmosphere not the best calculated to impart energy to the

system, and the quantity of food which they take, usually much more than they require with their limited exercise, all seem to predispose them to the disease in question. The irregularity of their habits, too, both as to sleep and exercise, is not to be overlooked in estimating the influence of the causes which produce hemorrhage of the lungs. This disease, though alarming, is by no means always necessarily fatal. If it be properly treated at the time of its occurrence, and the patient afterwards adopt an entire change as to diet, regime and exercise, if there had been any error in these particulars before, it may never again recur, unless there should happen to be some strong constitutional predisposition to it. When this is the case, before recovery from one attack is complete, another occurs, and the patient at length sinks into a confirmed pulmonary consumption. This is one of the most frequent terminations of bleeding at the lungs, when that disease has a fatal issue; though it has happened in some rare cases that the primary disease has been so violent in its attack that the system has sunk under it.

But, though consumption may arise in this way, it is unfortunately far from being the only mode in which it originates. It is the great scourge of our country, and sweeps off annually more victims than any other disease. It delights, too, in "a shining mark," and selects the young, the blooming, and the intellectual. Its attacks are usually so insidious that it has made sure of its victim before he is aware of the blow. A slight cough, which almost escapes notice, is for a time, perhaps, the only symptom of a malady that is sapping the constitution; this is followed by slight chills, which are succeeded by flushes of heat, recurring daily; a general lassitude and indisposi-

tion to action are soon perceived, and before long night-sweats and hectic fever set in as the melancholy precursors of the fatal termination, which will not long be postponed.

The frequency of this disease in the United States may be in part owing to the great and sudden changes of weather which occur in some parts of the country, and which have a baneful influence in all affections of the pulmonary organs. A change, essential to life, as has been before observed, is effected by the lungs in the properties of the blood; and it is certain that the skin performs to some extent an office of a similar character. When, therefore, the heat of the body is suddenly reduced, the blood deserts the surface and circulates more through the internal organs, and the skin consequently affords but little aid to the lungs. To persons of vigorous health this is of no consequence; but the case is altogether different with those of feeble lungs, and a violent hemorrhage has sometimes been produced merely by a sudden transition from heat to cold, in persons apparently in good health. Every physician is aware of the advantage of a uniform temperature in all cases of pulmonary disease. It is desirable that the lungs should have as little as possible to do, and it is important, therefore, to invite the blood to the surface by a steady and agreeable warmth. The changes produced in the appearance of patients laboring under consumption, by the changes in the temperature of the air, are very remarkable. While the atmosphere is mild and warm, the countenance, and the whole surface of the body, are of a natural healthy color; but a sudden reduction of temperature throws an increased volume of blood to the lungs, which are feeble and diseased; they are unable to effect completely the necessary change; dark-colored blood is,

consequently, returned to the heart, and thence sent to all parts of the body, giving the countenance a livid hue.

This view of the subject affords, perhaps, the best explanation of the advantages to be derived from sea-voyages in pulmonary disease. The temperature of the ocean is nearly uniform at all seasons of the year; and the air at sea is of an agreeable warmth, and subject to but slight variations. The lungs perform their functions with more ease, under such circumstances, than when subjected to great irregularity in the quantity of the blood sent to them, which is the uniform effect of great and sudden vicissitudes of temperature.

Advantages, however, are not always derived from sea-voyages in pulmonary diseases; partly because the voyage was not of sufficient length, or because the climate of the country to which the patient was sent was not adapted to his case, but more because the voyage was not undertaken at an earlier period. But little benefit can be looked for when there is an organic affection of the lungs.

We can understand, too, in this way of viewing the connection between the functions of the skin and those of the lungs, the advantages that may be derived in our own climate by artificial hybernation, as it has been called, of consumptive patients; that is, of confining them during the winter to a room kept at all times at an uniform temperature. There is more reason to believe, however, that patients lose nearly as much by the want of exercise, when subjected to this process, as they can possibly gain in any other way.

At a period of life somewhat later than that at which pulmonary affections are most likely to occur in literary men, diseases of another organ — the brain — are not unfre-

quently met with. Apoplexy and palsy, the two most important, are the only ones that I shall notice. Apoplexy, though its seat is in the brain, may arise from the state of that organ, or that of the stomach, or that of the circulating system. It is a state of mental stupor and bodily inaction, arising from pressure on the cerebral organ. Sometimes the brain is so much weakened by great mental efforts, made without proper attention to bodily exercise, that it is unable to bear the ordinary circulation of blood through it. At others, the stomach is overloaded, and cannot digest the food that is conveyed into it. This in some cases is sufficient, if immediate relief be not obtained, to produce such powerful effects on the brain as will terminate in apoplexy. And, finally, the exciting cause of the disease seems occasionally to be owing to the state of the circulating system; though it can hardly be supposed that this alone would be sufficient to produce it, if the brain were not already predisposed to it. At all times a large portion of the whole blood of the body circulates in the brain, and sometimes accumulates there in the veins and sinuses, producing directly compression, or leading to an effusion of water. At other times the blood is carried there with such force that some vessel gives way, blood is poured out, the brain is compressed, and the patient becomes apoplectic.

Palsy usually occurs at a later period of life than apoplexy. It seems to be owing to a deficiency of action in the brain and nervous system; it is sometimes universal, and at others partial. Frequently one side of the body only is affected; sometimes the lower half is paralyzed, and at other times it is confined to particular limbs.

There is in this disease the same loss of muscular power,

to a certain extent, as in apoplexy, but without the same disposition to sleep and mental torpor. It does not appear to be owing to congestion in the brain, or compression of that organ, but rather to a want of energy. Though the patient is not torpid, yet if the affection be at all severe the mind is usually affected in a greater or less degree; and if there should be partial recovery by the efforts of art, or the powers of nature, there is always reason to apprehend another attack. This remark, however, does not apply to that species of paralysis which affects a single nerve only. It is not uncommon to see this affection in the nerve which supplies the muscles of the face; it appears to have no connection with the brain, it is in all respects a local disease, and though the power of motion is not always recovered, no other inconvenience remains.

The circulating system is not exempt from disease. The heart and large arteries not unfrequently, towards the close of life, are so much distended as to impede and for a time interrupt their functions. These diseases, however, are by no means peculiar to literary men, though I am inclined to believe that they are more subject to them than those individuals who lead a less sedentary life, and who labor or take more active exercise in the open air. At any rate, it is certain that there is an intimate connection between this class of diseases and the passions of the mind. They become invariably more frequent, it is said, in periods of great public interest and excitement; and numerous cases of the kind occurred among the distinguished actors in the French Revolution.

I have thus noticed, in a very brief and imperfect manner, some of the principal diseases of literary men. This is not the place to say anything of the remedies; but I

must ask your indulgence a little longer, while I offer a few words on the subject of prevention. Everything on this point may be summed up in two words — temperance and exercise. By temperance I do not mean abstinence from distilled spirit. The good sense of our community has already decided that ardent spirits are never required by any individual in health; and that they should be administered in disease, like other powerful remediate agents, only by skilful hands. To the correctness of this decision I cordially add my testimony; daily experience teaches me that the use of alcohol not only swells our bills of mortality to a frightful size, but renders complicated and unmanageable diseases which would otherwise be under the control of art.

By temperance, when addressing a body of literary and professional men, I mean moderation as to the time allotted to sleep and study; moderation in exercise, regimen and diet, particularly in the quantity of food. The accommodating power of the digestive organs is such, that they can adapt themselves to almost any kind of nutritive substance, and assimilate it to the body, without any violent effort. The quality of the food, if it be not actually deleterious, does not produce much inconvenience, so great is the solvent power of the secretion of the stomach. But when the quantity is daily more than the wants of the system require, a powerful effort is necessary for digestion; during this process the other functions of the body are less perfectly performed than usual; the whole surface becomes cold, there is a general lassitude and indisposition to action, with a strong tendency to sleep. Nature thus, by a powerful effort and concentration of her energies on one point, at length succeeds, and the system resumes its wonted

activity. But if this is to be daily repeated, disease must inevitably ensue. The stomach may be excited to action a little longer by artificial means; condiments of various kinds, alcohol and wine, are often resorted to, but they only increase the debility which is sure to follow. At length the stomach loses its action entirely, or a sudden stroke of apoplexy follows a hearty meal, or the liver becomes incurably diseased, with dropsy and its attendant evils, or perhaps the heart and great vessels become so enlarged as to cut off all hope of relief.

I said that the quality of the food was of less consequence than the quantity, but I did not mean that it was of no consequence. It is desirable that it should be simple and nutritious, such as is easily digested; and every individual's own experience is the best guide on this point. In fine, it is important that the food taken should be in such quantity and of such a quality that it can be digested without disturbing the other functions of the body; without rendering the mind torpid, and the body inactive.

Exercise, to be of the greatest possible use, should be taken daily and in the open air. Passive exercise, such as sailing or riding in easy carriages, is best adapted to invalids, who are unable to take a more active kind. To them it is valuable, and the importance of remaining long in the open air seems not yet to be generally appreciated. Active exercise, such as walking, and riding on horseback, is what is required to preserve the health of those who lead a literary and sedentary life, while passive exercise is adapted to those who are in pursuit of it. Walking is, perhaps, on the whole, best calculated for students; for what is lost by the length of time necessary to obtain sufficient exercise is more than compensated for by the advantage

derived from remaining so long in the open air. Many are willing to take exercise while the weather is pleasant; but it should be taken daily, without regard to weather; and there can be no better proof of the benefit resulting from this, than the almost uniform good health of the members of the medical profession, who are exposed not only to all vicissitudes of weather, and at all seasons of the year, but who are compelled to expose themselves frequently to the night air.

Much has of late been said in favor of gymnastic exercises, and strong efforts were for a time made, and with some degree of success, to introduce them into our public seminaries. To the young they cannot be injurious; in many cases they are no doubt useful, but it may well be doubted whether they can ever be made to take the place of the youthful games and sports that have been transmitted for ages; and, if they could, whether the exchange would on the whole be advantageous. But if they are not undertaken at an early period of life, they may prove mischievous, by bringing into action muscles unaccustomed to be thus exercised, and in this way lay the foundation for some severe affection.

With attention to diet and exercise, modified to the peculiar circumstances of each individual as his own experience may dictate, almost every student may promise himself good health, with a fair prospect of attaining the age which is the usual period for man; and, what is of infinitely more consequence, he will have every reason to believe that the light of intellect will remain unclouded to the last.

PROFESSIONAL TRIALS

OF THE YOUNG PHYSICIAN; AN INTRODUCTORY LECTURE DELIVERED AT THE MASSACHUSETTS MEDICAL COLLEGE, NOVEMBER, 1841.

GENTLEMEN:

Most of you, I presume, are students of medicine. You have chosen the profession of the healing art as the business of your future lives. You have selected an arduous and responsible calling, and I trust you well considered the duties which you will hereafter be called upon to assume, before you made your final decision. I would not, however, if I could, make you regret that decision; but it may not be amiss to speak of some of the trials and disappointments which all in our profession are liable to meet, and to state some of the obstacles which you may encounter in your path. I do this not for the purpose of discouragement; but, if you are apprised of the difficulties to which you may be exposed, you will be the better able to overcome them. You will prepare yourselves more fully for the struggle; and if you prevail at the outset, as I trust you may, your success will cheer you onward in your course.

But, though our profession has its cares, its trials, its painful responsibilities, with days of toil and sleepless nights, it has, too, its cheerful hours, its pleasures, and,

may I not add, its honors. With all its difficulties, it is, to those who pursue it properly, a noble calling. Its study, when it is studied aright, enlarges the mind; and its practice, if practised as it ever should be, cannot fail to improve the heart. It brings us less in angry collision with our fellow-men than many of the other duties of life; it affords us opportunities of relieving human suffering to an extent which is enjoyed by no other class of society, and of studying the works of the great Author of our being in a way that can hardly fail to inspire us with a deep sense of his infinite power and goodness.

With an experience of more than thirty years of its study and practice, and having enjoyed a moderate degree of success, I can with truth say, that, knowing all that I now do concerning it, if I were to live over again, I should choose it as the business of my future life. You cannot, therefore, believe that I think meanly of it, or that I shall speak of the trials to which all who practise medicine must be subjected for any other purpose than to prepare you to meet and overcome them.

Young men, soon after they enter on practice, are not unfrequently disappointed, and, I may say, vexed, by want of success in obtaining business. Perhaps they do not always attribute this to its right cause. It is true, I fear, that it occasionally happens that some of them fail in this respect because they enter on their profession without sufficient preparation. They think too lightly of the preparatory duties. They regard a diploma as an end, and not as a mere evidence of some degree of proficiency in their studies; and they sometimes seek to attain this end with the least possible degree of labor. They skim superficially over the various branches of medical science, obtain a

general knowledge of the leading and most familiar topics, and rely upon this and chance to carry them safely through their examination. They have never been imbued with the true spirit of students. They have studied nothing deeply, they have hardly meditated at all upon what they have seen or read, nor have they observed faithfully and with diligence. When, therefore, they enter on the practice and are thrown on their own resources, the responsibility is more than they can bear, and they are crushed by its weight.

So numerous are the branches of learning that go to form a good medical education, that a diligent devotion of every moment of the ordinary period of pupilage is barely sufficient to give even a tolerable knowledge of them. The most that can be done, in the three or five years which are usually devoted to the study of our profession, is to lay a foundation, broad and deep, on which something valuable may be afterwards erected. There is no greater mistake than to suppose that the study of medicine should cease when we enter on its practice.

The celebrated Dr. Rush, when visiting on one occasion the department of the Pennsylvania hospital devoted to the insane, was struck rudely on the back by one of the inmates. The doctor turned quickly round; the man perceived his mistake, asked his pardon, and said that he mistook him for a medical student. The doctor replied, "My friend, I am a medical student, and hope that I always shall be." The truth is, that no one can look for eminence in our profession who is not actuated by the spirit of this reply. Our studies are most useful to ourselves and to our fellow-men when we are engaged in practice; for it is then that we have an opportunity of

applying what we have previously learnt, and bringing the statements of others to the test of our own experience.

The branches, too, are so numerous, as I have already suggested, that there is not actually time to study them properly. Some of them are elementary, and can be pursued as well while we are students as in after life; while there are others of which we cannot obtain a thorough knowledge until we are engaged in the practical duties of our calling. Anatomy lies at the very foundation of all medical and surgical science, and is not to be learnt as it should be by books and plates, and preparations and models, however exact they may be, but by careful, laborious and patient dissection. We must trace out each part for ourselves on the dead body; observe its connections, examine its structure, and compare it with that of the other portions of the frame; and in doing this, books and drawings, and other artificial means, will be useful auxiliaries. But to study anatomy as it should be done requires no small part of the student's time; a portion of each year should be devoted to it.

Chemistry and Botany are also elementary studies; they make us acquainted with the tools with which we are to work; or, more properly speaking, with the weapons with which we are to contend with disease, and to ward off, if we may, the fatal blow that may be aimed at our patients.

The study of Physiology also will demand no inconsiderable share of the student's attention; for he must be well acquainted with the functions of the body in health, if he expects to understand the deviations produced in them by disease.

Materia Medica instructs us as to the various remedies,

their modes of preparation, their doses, and the manner in which they are to be exhibited. It is obvious that this department must be carefully studied; precision is essential not only to the success of our practice, but also to the safety and lives of our patients. An apparently slight error in quantity may be productive of fatal effects.

Anatomy, Physiology, Chemistry, Botany, and Materia Medica, may be regarded, then, as the elementary studies, constituting the basis of all professional knowledge; and yet, to become familiar with any one of these would require more time than is occupied by the whole period of medical pupilage.

But, when a competent knowledge of them is obtained, they are to serve only as an introduction to higher, and to the physician more important studies. I need hardly say that these are Pathology, Surgery, and Midwifery. Each one of them is thought sufficient, in many parts of Europe, to engross the whole time of some of the most eminent men living. This division of labor does not exist, to any extent, in our country; perhaps it is best that it should not; but the simple fact that the same individual is called upon to practise such various duties, and all of them of so responsible a character, is sufficient to show the necessity of unwearied diligence and devotion to the requisite preparatory studies.

But when young men have labored faithfully as pupils, they will be often disappointed if they look for early success; and the disappointment is greater because they are unprepared for it — they have formed false expectations. Some of them seem to think that it is only necessary to have gone through their period of pupilage with fidelity, to entitle them at once to a large and lucrative practice.

Failing in this, they occasionally become disappointed with their calling, and are tempted to renounce it in disgust.

It is no doubt true that mankind in general are slow to employ young medical men. They require experience in those to whom they intrust their health and their lives. Though they may not undervalue the learning of the young candidates for fame, they attach more importance to that practical knowledge which books cannot give, and which a man can acquire only by the judicious use of his own faculties in his intercourse with the sick. To a certain extent this prejudice, if so you choose to call it, is well founded, and the young physician must be content for a time to render his services for the most part to those who can make him no other compensation than that of enabling him to study his profession at the bedside. Let him do this faithfully, kindly and diligently, and he will be sure to reap his reward. He will gain knowledge which will never fail him; and his services, if well performed, will by degrees introduce him to a better class of patients. In our country, fortunately, there are scarcely any individuals, however destitute, who have not some friends in competent circumstances; and these friends will not unfrequently employ a physician merely from his kindness to the poor. If there be no higher motive, though I trust there is with us all, self-interest alone, then, should prompt us to minister cheerfully to the sufferings of the needy sick.

But I may add that there is not, at the present day, that reluctance in our community to employ young physicians that there was thirty years ago. This is in accordance with the spirit of the times. There is not now the same deference paid that there once was to old habits, to

old institutions, and, I am sorry to add, to old age. And I am not without my fears that, if this spirit of reform, as it is called, continues, the old men will have more reason to complain of want of patronage than the young.

Young physicians sometimes fail of obtaining business because they adopt a wrong course at the outset. They enter too much into the ordinary pleasures and amusements of life. I refer, of course, only to the innocent pleasures and amusements; and, at their age, it is very natural that they should wish to partake of them. But, in so doing to any great extent, I am convinced that they make a false step.

The world regards physicians as in some measure different and distinct from the rest of the human family, having different feelings, propensities, and sources of enjoyment. Society seems willing to adopt the division which the old woman made of mankind, into men, women, and doctors. And it is perhaps well for both parties that a belief in the correctness of this division should in some degree be kept up. It creates a kind of confidence which might not otherwise exist; and does away with a great deal of reserve on one side, and embarrassment on the other, which might be very inconvenient and annoying to all concerned.

It is hard, I am aware, to forego the harmless recreations of life simply because the opinion of the world requires it; but it is one of the conditions on which professional success is to be obtained; it is, in fact, a part of the price that is to be paid for it. I would not be understood to say that this self-denial will necessarily bring success; but only that success will not be attained as early, if at all, without it. Every young physician should know that he will not be likely to arrive at eminence for

years, without he is influenced by a self-denying, self-sacrificing spirit. He must submit to privations often very severe and hard to bear, but he should regard them as a means by which he is to accomplish his object. There is nothing in this life that is worth having that can be had without paying for it; and almost everything can be had if we are willing to pay the price. Health, fame and fortune, are in the reach of almost every individual; but I fear that there are not many who are willing to submit to the terms on which they may be obtained. Temperance, industry and moderation in our wants, are the price by which we may ordinarily gain health, reputation and wealth; but if we are not willing to pay this price, we cannot expect to have the objects of our wishes. We have no right to complain, if we are unwilling to comply with the terms of the bargain.

And so it is with our profession; its rewards and honors are to be had only on certain conditions. These may seem to some to be hard; but every one must decide for himself whether the objects he seeks are of sufficient value to induce him to submit to these conditions. I would not be understood to say that it is necessary for a young physician to deny himself the enjoyment of private social and domestic intercourse; on the contrary, I believe that by cultivating the friendship of those who are deserving of respect he adds essentially to his own happiness, while he renders brighter his prospect of professional success. But, if he be among the foremost in the amusements of the day, absorbed with the ordinary cares of the world, and let it be seen that his profession is not uppermost in his thoughts, though he may be regarded as a friend, courted and caressed as a companion, and his

bating, has been wofully disappointed in the result. It may have carried him along smoothly and prosperously at first, but it is certain to end in mortification and regret, bringing with them the forfeiture of his own self-respect, and of the respect of his professional brethren.

There is one trial, of a very annoying and vexatious character, to which most medical men are subjected in the early part of their practice, and that is, the want of confidence which is manifested towards them by those with whom they are most intimately connected. It is too often the case that the relatives of a young physician look on with apparent indifference when he is struggling in a path beset with difficulties, and do not extend a helping hand till his own exertions have placed him where it can be of but little avail. It is true now, as it was in the time of our Saviour, that a prophet is without honor in his own country, and among his own kindred. Mankind find it difficult to realize that those whom they have known in their childhood ever cease to be children; and a man's own relatives are the last to perceive the change. They wait till every one else has discovered the skill and ability of their young medical relative; and when their patronage can be but of little use, and too often not till then, they are willing to extend it to him. Under these circumstances, the young physician would be justified in addressing such patrons in the language which Dr. Johnson used to Lord Chesterfield: "The notice which you have been pleased to take of my labors, had it been early, had been kind; but it has been delayed till I am indifferent, and cannot enjoy it; till I am known, and do not want it." Such chilling neglect is among the severest trials in the life of a medical man But he must learn, what I am certain is true in

most cases, that his support will be often derived from sources from which he has the least right to expect it; and that he must rely mainly for success on his own efforts, and be the architect of his own fortune and fame.

It must be admitted, however, on the other hand, that the early patronage of friends, if it be in the least degree excessive, may ultimately prove injurious to the object of it. It places him too soon in responsible situations, in which he may not justify the confidence that has been reposed in him. The best medical business is that which is gradual in its growth, and which is obtained by the individual's own exertions. It is the most permanent, as it is not the result of caprice or accident, but is the consequence of the good opinion that has been formed of the physician's merits. It is the more valuable, too, as it gives him occupation enough in his early career to interest him deeply in his profession, and at the same time does not engross him so entirely that he has neither leisure nor inclination to continue its study. If he fail to do this, and does not keep himself familiar with the progress of the sciences connected with the healing art, he certainly will not be able to advance, and he will find it no easy matter to maintain his position.

Whatever may be the neglect which a young physician experiences from his relatives, sound policy would dictate that, if possible, he should show no impatience under it. An opposite course would do him no good, and might gratify those who were so destitute of right feeling as to treat him as they had done. Complaints, querulousness and fault-finding, avail nothing but to injure him who resorts to them. Indifference should be assumed, if it be not felt; and the injury under which he smarts should

be patiently borne. He should console himself with the belief that "sufferance is the badge of all our tribe," and that his lot is not different from that of most of those of the same calling who have gone before him.

The trials of a professional life of which I have been speaking are those that arise principally from want of employment. There are others, however, which most physicians are destined to encounter even when engaged in active and extensive practice. Some of these may be regarded as necessarily incident to our profession in the present state of knowledge; whilst others grow out of an erroneous condition of public opinion. There is not time to enter at large on these subjects; I will, however, briefly notice some of them.

With regard, then, to the first, those which seem to be inseparable from our profession. When a physician enters on business, especially if he has applied himself diligently to the various branches of his professional studies, he is apt to think that he is prepared to combat with success disease in every form. He has found, in the volumes of learned lore through which he has waded, all the ills to which flesh is heir, described with a minuteness and apparent accuracy that would seem to render it impossible that he should be at a loss to recognize them. The symptoms are so clearly pointed out, the lines of demarcation that separate one from the others are so well marked in the books, that it could hardly be imagined that any one, even of the dullest perceptions, could mistake. He has the rational signs and the physical signs all so carefully enumerated, that it is as easy, he would think, to know a disease by them, as it would be to recognize a mineral, a plant or an animal, by its technical description. Nor is

this all. For, though the learned authors occasionally admit—reluctantly, I know—that some of the diseases are obstinate, others unmanageable, and a few incurable, they are never at a loss to furnish you with remedies in abundance; and such are the resources of our art, that the more mortal the malady may be of which they are treating, the longer is the list of powerful means by which they propose to overcome it. Thus showing that it is as true now as it was in the days of the father of physic, "Ars longa, vita brevis est."

In this way the young physician is often deluded, and consequently enters on his duties with wrong expectations. For a time, nothing may happen to undeceive him. His early cases may be such as go on spontaneously to a favorable termination. But this cannot last long. Some one will occur of a different character; at each succeeding visit he will find it assuming a graver aspect; all the means in which he had the greatest confidence will be tried in vain; and the disease will go steadily on, uncontrolled and unchecked, till it closes the mortal career of his patient. For this he is unprepared; he is overwhelmed with regret and self-reproach, and is apt to imagine that a different course might have produced a different issue.

He is yet to learn that many of man's maladies are in themselves mortal; that human power has no control over them; and that the most which it can do, in many cases, is to lighten human suffering, and smooth the passage to the tomb. The physician feels still more keenly if it should happen, as it sometimes does, that the patient was one to whom he was bound by strong ties of personal affection, and who relied on his skill with unfailing confidence. Though his sufferings may soon cease which arose from a

belief of neglect or omission of duty on his part, he will still be apt to reproach the profession in which he had confided too strongly; he will be, perhaps, inclined at first to renounce it altogether. He may feel a disgust for a calling in which he has spent the freshness of his youth and the vigor of his days, and which has failed him at his utmost need.

But in such cases the main difficulty arises from a false estimate which has been made of the resources of our art; from expecting more from it than it can possibly accomplish. And this extravagant opinion of human power and human skill is far from being an uncommon error, by no means confined to the vulgar and unlearned. It is frequent among medical men as well as among others; and they speak of curing disease and restoring health as if they were really something more than very feeble auxiliaries to nature's efforts. A physician should be, what Lord Bacon says every man ought to be, the interpreter and servant of nature. This is his true province; in this he may be useful, I had almost said invaluable, to his fellow-men; but if he attempts more, he will be more likely to do mischief than good.

But even when a medical man has a right view of the power of the remediate agents he employs, he is often called to severe trials. He is doomed to see, in many cases, the triumph of disease; he is compelled to stand by and watch its slow but certain progress; his remedies are inert, or at most they are but palliatives; and, though they may give comfort, they cannot prevent the fatal issue. This must be the case in the present state of our knowledge; perhaps it ever will be so. But it does not lessen the value of our profession; it is only an additional motive for cultivating

it with more assiduity. The influence which it may exert when it is properly practised can hardly be overrated. It is both moral and physical, giving confidence, tranquillity and hope, to the doubting and often enfeebled mind, and ease and comfort to the wasting body.

Another source of vexation that is common to medical men, even when in full practice, is the encouragement that is given by almost every class of the community to those who deal in all sorts of empiricism and quackery. It matters not how ignorant and unprincipled these pretenders may be, or how extravagant are the pretensions they set up, — they find dupes in abundance. Our land swarms with empirics of all descriptions at the present moment. Every city of any size can furnish an example of each species, from the reckless practitioner who deals in enormous doses of deadly drugs, down to the credulous disciple of Hahnemann. We abound in steam-doctors, natural bone-setters, cancer-doctors, seventh sons of seventh sons, Indian doctors, and itinerant eye-doctors; and, as if our sex did not furnish impostors enough of this kind, the women have taken the business in hand, and we are now supplied with a goodly number of "female physicians."

Men of science, education and long experience, are in too many instances deserted for characters of this description; and this is done frequently by individuals of no ordinary degree of intelligence. In fact, men who ought to know better will often encourage the most ignorant and worthless pretenders to the healing art; and the very fact that it is quite impossible for them, from their want of opportunities and education, to know anything of the subject, seems to be their best recommendation. Profound ignorance, entire want of personal respectability, and gross

habits of intemperance, are sometimes no bar to extensive practice. It cannot be denied, too, that many individuals of good standing in society represent the skill of such practitioners as greatly superior to that of the large body of well-educated men; and apparently take a pleasure in making statements, both in public and in private, in their favor, which, to say the least, are quite as strong as the truth will warrant.

It must, however, be admitted, on the other hand, that patients sometimes improve while under the care of these empirical practitioners. The disease with which they were afflicted may have been nearly subdued by the former treatment, or it may have passed off spontaneously, and the new remedy in this way gets the credit of doing what in truth is the work of nature; and perhaps, in some few instances, these bold and reckless men, made bold by their very ignorance of the danger they incur, give relief by a resort to harsh and violent means, which a well-informed and prudent man would not think safe to adopt. For "fools rush in where angels fear to tread." They thus anticipate by their rashness what would have been accomplished with equal certainty, though in a more gradual and safer manner.

The confidence that is too often reposed in such individuals, by persons of sound judgment in other affairs, is a striking example of the infirmity of human nature. Men who would not trust an ordinary piece of machinery to any but a skilful mechanic, who understood the various parts of which it was composed, will frequently put their own bodies, infinitely more curious and complicated than any specimen of human mechanism, into the hands of those who know nothing of the structure and functions of the human frame.

If one half that is sometimes said of the skill of these empirics were true, it would be useless for you to come here; it would be worse than useless for you to spend some of your best days in the loathsome atmosphere of the dissecting-room, and in the foul and tainted apartments of squalid misery and sickness. Your science, and learning, and patient observation, would avail nothing, when placed in competition with the ignorance and effrontery of these rash and desperate practitioners. The sooner the schools of medicine were abolished the better, if it were true, as is by some asserted, that those educated in them are less skilful than the untaught. But it is not true; and though, for a time, the latter may have a degree of reputation and apparent success, it is not lasting; while the learned, pains-taking and faithful physician, is acquiring by his labors an enviable reputation and a spotless name.

The true way to discourage quackery is to raise the standard of medical education. Make it apparent that men of science are more skilful than mere empirics, and the former will be universally preferred. It must be confessed that much of the encouragement which is given to these ignorant pretenders may be attributed to the imperfection of our art, — to the numerous instances that are frequently occurring in which it is baffled by disease. Individuals finding no relief, and no promise of relief, from educated physicians, will occasionally resort to men of fairer words and more supple consciences, who will not hesitate to assure them of a cure in cases where it is evident that human means must be unavailing. Invalids, with bodies worn down and minds enfeebled by long suffering, will grasp at anything that holds out a hope of recovery; and it is not strange, therefore, that if, under

such circumstances, they cannot obtain it from the skilful, they will seek it, heedless of consequences, from the artful charlatan.

We must labor, then, to improve our profession; to extend the boundaries of medical science, so that it may bring within its control many diseases which are now incurable. This is the proper mode of checking empiricism; we cannot contend successfully with its disciples in any other way. They would not feel the weapons which men of science would use, and those by which they could be reached educated physicians could not stoop to employ.

I have thus sketched, gentlemen, briefly and imperfectly, some of the trials which you are likely to meet in your career. I have presented to you only the evils of our profession; but there is a brighter side of the picture. It was not, however, my intention, nor is there time, to look at this. But I must say that our profession has its pleasures, as well as its pains. We are sometimes, it is true, censured without cause, but we are more often the objects of grateful interest when we may, in fact, have done but little to merit it. Our calling is, on the whole, a cheerful one; we meet with more gratitude than unkindness; and, though we are the frequent witnesses of painful suffering and distress, we are still more often present at scenes of heartfelt joy and relief. Our duties become less burdensome as we advance in years; the severity of the struggle is at the onset, when we are best able to bear it; when the heart is buoyant with hope and the bright visions of future success. The painful responsibility that weighs heavily on the mind in early life lessens as we advance; and we find, if we have done our duty faithfully, that as we increase in age we increase also in the confidence and respect of our fellow-men.

You have entered on your studies at an auspicious moment. The facilities for the acquisition of knowledge are increased and multiplied to an almost indefinite extent. It may, I believe, with truth be said, that the means of acquiring medical science are greater in this country now than they were in Europe thirty years ago. There are teachers of experience in every department; well-appointed hospitals, where disease in every form can be studied and the power of remedies observed; in which, too, an opportunity is offered of seeing the operations that accident, or malformation, or any other cause, may render necessary; and in our commonwealth, by the enlightened policy of its government, practical anatomy can be pursued under the sanction of the law. The period, too, is favorable, as less deference than formerly is paid to authority in medicine. We are not as much attached to theories and systems as men were in other times. We hear but little of the humoral pathology or the doctrine of the solidists; we have no Cullenians or Brunonians at the present day; and there is no one who is ready to adopt, without examination, the dogmas of any man, however great his name and reputation may be. It is an age of inquiry and observation, in which students are carefully collecting facts, without caring whether they will support any prevailing theory. The science of medicine may be said to be at present unsettled, in a state of agitation, undergoing a change, which we have a right to believe, from what has already been done, will be a salutary one. It looks to every one of its votaries to contribute something to make it so.

The increased facilities which now exist for the acquisition of professional knowledge bring with them corresponding duties. More will be required of you than of those

who have gone before you, by your fellow-laborers in the cause of science and humanity, by your patients, and by the community at large. Disappoint not their just expectations. Faithfully improve the opportunities which you may enjoy in your pupilage, and enter on the practice of your profession with a firm resolve to add something to the general stock of knowledge, to lessen human suffering, to acquire the esteem and respect of your professional brethren; and by so doing you may be assured of a prosperous career, a useful life, and an enduring fame.

ON SOME OF THE DUTIES OF THE MEDICAL PROFESSION;

AN INTRODUCTORY LECTURE AT THE OPENING OF THE NEW MEDICAL COLLEGE, NORTH GROVE STREET, BOSTON, NOVEMBER 6, 1846.

Gentlemen:

We meet to-day, for the first time, in this building. It has been erected since our last course of lectures, and it is to be henceforth devoted to the promotion of medical and surgical knowledge. It will be found, it is hoped, well adapted to supply the wants of those who come here for medical instruction. It is furnished with ample and commodious lecture-rooms; with convenient apartments for cabinets of specimens to illustrate the various branches of our science; with a spacious laboratory, with all the necessary appliances for the elucidation of the lectures on chemistry; with a room for the library, to which the students will have free access; and, in addition to these, it has the proper conveniences for the prosecution of practical anatomy, a department of knowledge of the greatest value to the physician, and of paramount importance to the surgeon.

It is our pleasure, as well as our duty, on this occasion, to make our grateful acknowledgments to those citizens whose munificent liberality has contributed to the erection

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It is our pleasure, as well as our duty, on this occasion, to make our grateful acknowledgments to those citizens whose munificent liberality has contributed to the erection

of this edifice; and our thanks are in an especial manner due to one* whom we are proud to call a professional brother, whose well-timed bounty secured the accomplishment of an object which might otherwise have been for some time postponed. We know that he will feel himself amply rewarded by the consciousness that he has done something, as he often has before, for the prosperity of his native city; something to aid the student in the acquisition of professional knowledge, and something, we trust, for the advancement of the various branches of the healing art.

But, while we feel grateful for these increased facilities for the communication and the acquisition of knowledge, it must not be forgotten that they impose new duties both on teachers and pupils. Both, I trust, will feel that more is expected of them; and both, I am confident, are prepared to enter on their labors with increased zeal and earnestness. Let it not be our reproach, that the liberality of the community has been misplaced; that we are insensible or indifferent to the advantages we possess, or that we are unwilling to labor for the advancement of an art which is so intimately connected with the health and the lives of our fellow-men.

It has been the practice in this institution, for a few years past, to begin our annual course by an introductory address, by some one of the faculty; and, unfortunately for the audience and myself, that duty, this day, devolves on me. Presuming that most of those who are present are members of the medical profession, or are preparing themselves for it, it occurred to me that I could not better occupy the first hour of our meeting than by saying a few words upon some of the duties of that profession. I shall

* The late George Parkman, M.D.

speak but of a few of these; they are those, however, the obligation of which every man in our calling should deeply feel.

The first of these — the great, the most important duty — is that of qualifying one's self, by adopting every means within his power, for the practice of the profession. In the other callings of life, if an individual undertake to do that for which he is not qualified, he alone, for the most part, is the sufferer. His deficiencies, let them come from whatever cause they may, will sooner or later be known; the confidence that had been reposed in him will be gradually withdrawn, and he will then look back with bitter regret on time misspent, and opportunities unimproved.

With us it is somewhat different. We undertake to practise a calling which professes to have the power, in many cases, of lessening human suffering; in some, perhaps, of successfully combating disease, and in others of prolonging human life. I will not undertake to say, nor would it be easy to do it, to what extent these professions are well founded. That there is some ground for them, I am sure; but that the great mass of mankind confide too much in the powers of the healing art, I have no doubt. Without stopping to discuss this point, it is very certain that a great degree of confidence is reposed in the members of our profession; the health and the lives of our fellow-beings are intrusted to our care; our aid is often sought, in moments of trial and difficulty, with such an assurance, on the part of those who seek it, that it will not be unavailing, that adds most painfully to our responsibility; and it cannot be doubted that there are situations in which we are sometimes placed, where the life of a human being may depend upon the course which we adopt at the

time. Here, then, our deficiencies affect others. They may cause the loss of a human life, or entail upon a fellow-being an incurable infirmity.

It may be said that this is an extreme case — one of rare occurrence; but, even admitting this, the mere fact that it may happen would alone be a sufficient reason for assiduity and diligence in preparing ourselves for practice. But it is not so rare as some may imagine. There is hardly a physician of any experience to whom it has not happened; and it is quite as likely to occur at the outset of our career as at any other period. It may happen to any pupil who now hears me, almost as soon as he leaves these walls and enters on the duties of his profession.

He may be called to a patient in extreme agony, with symptoms that may arise from different causes, and which would require very different modes of treatment. If he has availed himself of all the opportunities which have been within his reach during his pupilage, he would be at no loss to decide upon the nature of the complaint and the mode of treatment; he would act promptly and with confidence, and the patient would, in all probability, be soon restored to health. But, on the other hand, if he be at a loss to decide, the mere delay consequent upon this doubt may be fatal. This may seem an extreme case; yet it has occurred, I fear, too frequently. Strangulated hernia has been mistaken for a spasmodic affection of the bowels; the treatment, of course, has aggravated the difficulty, and hurried on a fatal termination. Even delay, under such circumstances, will compromise the safety of the patient, and death may occur before the medical attendant has decided what course to adopt. Yet both colic and strangulated hernia are, in a majority of cases,

if seen early, within the control of remedies; and almost any one who has diligently studied his profession may, in most instances, bring them to a successful issue.

Let me suppose that one of the first cases to which you are called, when you begin the practice of your profession, is that of an individual who has received a deep wound from a sharp cutting instrument. There are many circumstances connected with cases of this kind that add much to their painful interest. The sudden manner in which they occur, the great amount of blood that is usually lost, the entire prostration of the patient, and the frightful change in his appearance, ordinarily produce so much terror in the bystanders, as to prevent them from rendering any assistance to the sufferer. They depend entirely on their medical adviser; the whole responsibility rests on him, and they anxiously wait his arrival. Here, then, you are thrown upon your own resources. There is no time for counsel. You must not only decide what is to be done, but you must be prepared to do it promptly. The scene is most frequently one of great confusion, and calculated to disturb the equanimity of the most cool and self-possessed.

On your arrival, you probably find that the flow of blood has ceased from the fainting of the patient. He is cold, pallid, almost insensible. You fear to bring on reäction, lest the bleeding should return; you are equally afraid to have him remain as he is, lest death should soon close the scene. If you should simply dress the wound, without ascertaining what vessel is injured, and securing it, if it be one of any considerable size, you will find, to your sorrow, that the trouble is not over. If the amount of blood lost be not very great, and if the patient had been

previously in good health, reäction will come on, and you may indulge the delusive hope that the danger has passed. But this will last but a short time. A second bleeding will occur, and you will be summoned again in haste to your patient. Again you may find him faint, and the blood no longer flowing. You may be again tempted to resort to means that will be only temporary in their effects. If you do not feel entire confidence as to the proper course to be adopted, you will make increased pressure, and bind up the part more firmly than before. You will persuade yourself, if you have not studied your profession as you should have done, that you will have no further difficulty, though the chances now of the recurrence of the bleeding are vastly more than they were before. And it will recur; and the same course will be gone through with three or four times more, till the patient gradually sinks away and dies. Not because there was anything necessarily fatal in the accident, but because his professional adviser did not know how to treat it. This is not an imaginary case; I have known it to happen more than once.

Let it never happen, I beseech you, to any one of you; and it cannot, if you improve the opportunities of acquiring knowledge that will be offered to you here. The instruction which you may derive from the lectures and the dissecting-room will render you competent to the management of such cases.

I could adduce, I am sorry to say, many others of a similar character, well calculated to enforce what I wish to impress upon you, the moral obligation which is imposed upon every man, who undertakes to practise the profession of the healing art, to qualify himself in the best manner

he can to discharge the duties of it. I will add but two or three more examples, and these belong to a class from which the members of our profession have experienced more vexation than from almost any other source. I allude to injuries occurring about the joints. On every account, it is of the utmost importance to examine accidents of this character with extreme care. An erroneous decision may entail upon the patient an infirmity for life; and may bring upon his attendant, not merely mortification and regret, but not unfrequently the heavy penalties of the law. I would not imply that in every case, if the nature of the injury be perfectly well understood and managed, the limb can be restored to its former usefulness. I know it often cannot be; and there is hardly any subject upon which mankind are more unreasonable than upon this. They attribute to mismanagement, oftentimes, what is due in part to the accident, and in part, perhaps, to the state of the patient's system. They seem to think that it is in the power of our art to restore the limb to its original condition, be the injury what it may; and if this be not accomplished, they too frequently try to make their medical attendant responsible. I am grieved to say that there is much reason to believe that professional men sometimes encourage suits of this kind against their brethren; and it is melancholy to think that decisions in such cases are too often made by men who are utterly incompetent to form any opinion on the subject. It is no unusual thing to have a dislocation complicated with a fracture of the neck of the bone; in such cases it is almost impossible to restore the head of the bone to the socket before the fracture has united; and we are then oftentimes foiled in our attempts to do it, by adhesions that have formed, by partial obliter-

ation of the socket, and other causes. Under these circumstances, judicious surgeons proceed with great caution; they are fearful of resorting to violent means, because they know that these would certainly do harm, and that even mild ones have sometimes cost the patient his life. But, if they have from the beginning understood the nature of the accident, they can explain it to the patient and his friends, and in most instances satisfy them, even if the limb be stiff, and its motions limited, that all has been done that could have been, and that the patient is indebted to the skill of his attendant for his limb, if not for his life. And, what is more important than all, a thorough knowledge of the injury, a correct diagnosis in the beginning, enables the surgeon to adopt that course of treatment that is most likely to bring it to a successful result. He is not disturbed by doubts, or embarrassed by conflicting opinions; his path is a plain one, and he pursues it steadily and with confidence; and, let the result be what it may, he has the conscious satisfaction of knowing that a different method of treatment would have probably left his patient in a far worse condition.

But there are sometimes cases of this kind in which a correct diagnosis is not made; a wrong method of treatment is consequently pursued, and an incurable lameness or deformity is the result. I am aware that there is often a great degree of obscurity about these accidents; yet in most of them I am confident their precise nature may be ascertained by any one who has studied his profession aright; and their very obscurity calls for greater care and caution in examining them. An individual may have injured his shoulder by a fall or a blow on the part. There may be a fracture of some portion of the shoulder-

blade about the socket, or the head of the bone may be displaced. The two accidents have some symptoms in common. Now, if a wrong opinion be formed in a case of this kind, the chance is that the motions of the limb will be, for the remainder of life, very much limited; the limb may become almost entirely useless, and in some instances the patient will suffer excessively from the preternatural position of the head of the bone. This is very likely to happen when a dislocation of the shoulder is mistaken for a fracture of the acromion process; no attempt is made to replace the head of the bone; the axillary plexus of nerves is usually compressed by it; the limb consequently wastes and is painful, and its motions are limited, and occasionally almost lost. If this injury had been properly understood in the beginning, there would have been but little difficulty in its management. The dislocation of the shoulder is more frequent than that of any other part, and perhaps when recent more easily reduced.

It is not unfrequent for a fracture of the condyles of the humerus to be mistaken for a dislocation of the elbow; and in consequence the patient will be very likely to have a permanently stiff and deformed limb.

Injuries about the hip are often productive of still more serious mischief, from the greater importance of the limb concerned, and the greater degree of violence by which the accident is usually produced. Their diagnosis is rendered difficult by the thickness of the muscles by which the joint is covered and surrounded. We cannot feel the parts concerned in the injury with the same ease that we do in accidents about the shoulder or the elbow. We are thus deprived of one important means of arriving at a

correct opinion. Yet it cannot be denied that there are others, which, if carefully used, will most likely lead to an accurate decision. Within a few years great light has been thrown upon this heretofore obscure subject. Mistakes are less frequent than formerly. Regular physicians, for the most part, are familiar with the diagnostic signs of fracture of the neck of the thigh-bone and of dislocated hip, the two accidents which have been so often mistaken for each other. Yet we still occasionally hear of an erroneous opinion being formed, and in consequence an erroneous method of treatment being adopted. If the accident be a fracture, and the attendant who has the case in charge supposes that there is a dislocation, it is obvious that the treatment will be almost anything but what it should be. Extension will be used; the patient will be subjected to extreme suffering; and while the limb is extended it will be thought that the object is accomplished, and the head of the bone replaced. But as soon as the muscles are allowed to contract the shortening reäppears, and the deformity is as great as before. Renewed efforts are then made, and repeated perhaps several times, till the sufferings of the patient are almost beyond endurance, and compel his professional adviser to desist. To say nothing of the immediate suffering of the patient, the bone will not, in all probability, unite as quick or as well as if the case had been left entirely to nature.

It has happened, though I hope not often, in cases in which the head of the thigh-bone has been thrown from the socket, that the accident has been mistaken for a fracture of the neck of the thigh-bone. An error of this kind is of much more consequence than the preceding. If the bone is to be restored to its place, it must be done soon, if

at all; and if it be not replaced, the patient is very likely to have lameness, deformity, and perhaps suffering, for the remainder of his days. It is true that dislocations of this kind, if well understood from the beginning, cannot in every instance be reduced. But if the patient be aware of the nature of the accident, and be satisfied that all proper means of relief have been adopted, he will, for the most part, be reconciled to his condition; but if he feels that his case has not been understood, and that proper efforts have not been employed, he will be very likely to heap bitter reproaches upon his attendant.

It would be easy to multiply cases in which ignorance in our profession might oftentimes entail lasting infirmity, if it did not cause the death of those whom we undertook to relieve. The mere possibility of a solitary occurrence of this kind makes it an imperative duty for every one who intends to practise the profession to qualify himself for the faithful performance of it. It is an obligation of the strongest kind; it is wonderful that all do not feel it. We have no right to assume an office, the discharge of which involves the health and lives of our fellow-men, without preparing ourselves as far as we can for so responsible a station. If we are not willing to undergo the labor, toil and privation, which this preparation demands, then we should not undertake the duties. I would say to those who have come here as pupils, that if they are not ready to submit to the self-sacrifice which our profession demands of all its votaries; if they are not willing to devote themselves earnestly and with their whole hearts to the acquisition of knowledge, not merely now, but when they have entered on the practice of their calling; and if they do not feel the deep and almost overwhelming respons-

ibility of the occupation which they have chosen as the business of their future lives, let them go no further; it is better to stop now than to be compelled to retrace their steps hereafter, or than to go on in a course which cannot, under such circumstances, be pleasant or honorable to them, or useful to their fellow-men.

The duty which we owe to the community is a sufficient reason, as I have before said, for diligence and assiduity in studying our profession, not merely while we are pupils, but after we have become practitioners. There are other reasons, of a personal character, of far less importance, I admit, than the one of which I have already spoken, but yet not entirely without their weight. Without a competent knowledge we can never practise the profession with comfort to ourselves. We shall be continually disturbed with doubts and embarrassed by difficulties, which arise entirely from our own want of qualification. Every new case will be a source of new difficulty, and our daily labors will be burdensome and oppressive.

On the other hand, if we are adequately prepared, and have kept ourselves familiar with the advance which the science of medicine is daily making, we shall find our occupation agreeable and our labors light. We shall have, too, the satisfaction of feeling, let the result of a case be what it may, that we have done all that art could do, and thus escape the bitterness of self-reproach. The practice of medicine, under such circumstances, is among the most agreeable callings of life; the responsibility, which at the outset is painful, daily becomes less so, till it is only enough to stimulate the practitioner to an exact performance of his duties. He will find himself, too, an object of affectionate interest to many who feel that they owe much

to his skill, and he will gradually acquire an honorable and respected name.

It should not be forgotten — and the fact may have an influence with some — that it is very rare for any member of our profession to acquire and long retain the patronage of the community without adequate preparation. He may, it is true, if not qualified, enter on his duties under such favorable auspices as to secure, for a time, an extensive business. But this will not probably continue; and at that period of life when others, more competent, are pursuing a successful career, he will be likely to find himself in great measure neglected by his former patrons.

I do not mean to say that every well-educated physician is sure to obtain patronage; I am aware that there are many adventitious circumstances that control this, to some extent; but I do believe that no man who is not well educated can retain, for a series of years, an extensive and valuable practice. He will be overlooked when he arrives at that age at which, under other circumstances, his counsel would have been eagerly sought; and he will be doomed to experience the most chilling neglect, at the very moment when a well-qualified physician enjoys the most enviable fame.

There is another duty which I deem of great importance, and which I think many members of our profession disregard too much, that may be called the moral management of the sick. Some men seem to think, that if they have pursued their studies with diligence when pupils, and continue to do so while in practice, it is no matter in what way they discharge their professional duties. They are oftentimes rude, impatient and harsh, in their intercourse with the sick; they manifest no sympathy for their

sufferings, and have in their manners the appearance of indifference, and want of feeling. This is a mistake in every point of view, both as it regards the patient and his attendant. Kindness to the sick may be regarded as a remediate agent. A bright countenance, a cheerful smile, or an encouraging word from the physician, often does the invalid quite as much good as the prescription. The mind has a wonderful and mysterious influence over the body, both in health and disease; and that practitioner who overlooks or disregards this does not avail himself of all the means within his reach in the management of the sick. He deprives himself, in fact, of a very useful agent, which others, often less learned than himself, use with great adroitness.

I do not suppose that any man can feel deeply for the sufferings of all whom he visits. It would unfit him for his profession if he did. But he can at least avoid the appearance of indifference; he can manifest some degree of sympathy, and can oftentimes light up, by his kind and cheerful manner, a spark of hope in the breast of a sufferer, which protracted illness had almost extinguished.

Self-interest usually prompts practitioners, in their intercourse with the affluent, to adopt the manners which they think will, in all probability, be most acceptable. If they are rude, abrupt and apparently unfeeling, towards them, it may in most instances be set down as affectation. They have heard of some physicians who disregarded all the little courtesies of life, and who were occasionally almost brutal to their patients; and they are unwise enough to attribute their success in life to the peculiarity of their manners, when, in truth, the most that could be said is that they succeeded in spite of them.

The sick have a claim upon our sympathy; and when, in addition to this, they are poor, the claim is still stronger. I know not how any man can be insensible to it. And yet I fear that most of us do not bear this sufficiently in mind. Some medical men manifest impatience in their visits to them; they do not make sufficient allowance for the mental weakness that grows out of bodily suffering; they treat their complaints too frequently with a chilling indifference, and make it apparent that they regard much that is said to them as unreasonable querulousness. If they choose to adopt this course to the rich, I will find no fault; but I can assure them, if they do, that not many of that class will long seek their advice. But I maintain that they have no right thus to treat the destitute. They are in some measure in our power; to a certain extent dependent upon us; they have little or no means of redress when injured or ill-treated, and they have therefore a stronger claim upon our kindness and sympathy. We should never forget that we are of one brotherhood; creatures of a common parent; subject to the same infirmities; and we cannot tell how soon we may make the same demands on our fellow-men as they now make on us. I am sure, too, that kindness is never lost upon them; it costs us but little, yet it does much to soothe and comfort them. Every man, I am confident, must feel better, who thinks he has done something to smooth the pillow of sickness; and if it be not in his power to remove the disease with which his patient is afflicted, that he has at least lessened his sufferings, and made his exit from life more easy. We have nothing to do with their moral delinquencies; we are only called upon

to minister to their physical infirmities, and to remove them if we can.

It occurred to me, in a recent visit to Europe, that the poor in some of the public institutions which I saw there were treated with more kindness and consideration than they are, for the most part, with us. There are two asylums for paupers maintained by the city of Paris, called the Bicêtre and the Salpetrière,— one just out of the walls, and the other within, — which contain nearly ten thousand inmates. These establishments are exclusive of the hospitals, which have at least ten thousand free beds, most of which are usually filled. Among the subjects of these two alms-houses, some are suffering merely from the infirmities of age; others from those of excess or previous disease, and there is in addition a large number of idiots, epileptics, and maniacs. I spent a day at each of these institutions; and I certainly did not spend two days more to my satisfaction, while I was in that interesting city. It was delightful to see the kindness with which they were treated by all the officers, from the highest to the lowest; and equally delightful to see the grateful feelings of these poor, helpless beings, depicted in their countenances, as we passed through their rooms. It was evident, from their manner, that this was the mode in which they were accustomed to be treated, and not put on because a stranger happened to be present. Everything was apparently done to make them comfortable. There was light occupation for those who were not too infirm; there were but few, if any, who passed their time in listless idleness; and all the improvements in the management of the insane, which have been so great within a few years past, are now

introduced, if they did not originate, in these establishments.

They have also taken a step in advance of any other institution in the world; they have established a school for idiots, in which they combine both physical and intellectual culture. It is wonderful how much has been already accomplished by patience, kindness and perseverance, among this apparently hopeless class. The progress made by some of these moping idiots is almost beyond belief. I saw individuals there, who, when they entered, had hardly intelligence enough to enable them to walk securely, and who could not tell the number of their fingers, draw diagrams on the black-board, and demonstrate problems in geometry. And the school had not then been in existence more than three years. All this was accomplished mainly by persevering kindness. It was this that reached and brought out the ray of intelligence, of whose existence there was before hardly the slightest evidence.

I have selected these two asylums as examples, because many of their inmates are among the least deserving class of society. The greater part have brought themselves to their present condition by an habitual indulgence in vicious habits of the grossest and most offensive kind, and are consequently the least likely to excite the sympathy of their fellow-men. Yet all this does not prevent those under whose charge they are placed from treating them with a degree of kindness that is usually extended only to the more worthy. In fact, in all the charitable institutions that I have visited, both in Great Britain and on the continent, the same mild and gentle plan is adopted; as if it were intended not merely to relieve the wants of those whose necessities were supplied, but, if possible, to im-

prove and reform them. Gratifying as it was to witness this course in relation to the vicious poor, it was infinitely more grateful to see it extended to those who were only sick and destitute. I know not a more interesting sight than can be obtained by a visit to the hospital for sick children at Paris. The nurses of these poor little patients are sisters of charity, who are prompted by religious motives alone to devote their lives to this holy office. Nothing can exceed their kindness, solicitude, and watchful attention. The bright and happy countenances of the children who are not suffering acutely, and the perfect contentment of all, are enough to satisfy any one how well they are treated. They are guarded by these kind women with almost the same anxious care that a fond mother extends to her own offspring.

I am rejoiced to learn that a similar institution, but, of course, on a much smaller scale, is about to be established in this city; and from what I know of the skill and active benevolence of the individual who has projected, and will, no doubt, manage it, I am confident that it will be a blessing to our community.

I hope I shall be excused for having suggested to those who are preparing themselves for the profession of medicine the great importance of an uniformly kind and gentle manner in their intercourse with the sick, without regard to their condition in life. It is important, both to the practitioner and the patient: it often gives to the former an influence and authority in the sick room which he would not so readily acquire; and, by soothing the latter, it not unfrequently lessens his sufferings, and sometimes even hastens his recovery.

I shall be pardoned, too, I trust, for saying to students

how desirable it is, in attendance upon surgical operations, to observe the most perfect decorum and silence. I can hardly imagine a more painful situation than that of a patient who is brought into the theatre of a hospital to undergo an operation. He is usually among strangers; with the anticipation of severe suffering before him; often at a distance from his home, and deprived of all those little endearing sympathies of domestic life which are so grateful under such circumstances. An appeal is thus made to the best feelings of our nature that ought to be irresistible; and I am confident that when levity or indifference is manifested at such times by any of the spectators, it is from thoughtlessness merely, and not from want of feeling. I would not do so much injustice to any one of our profession as to suppose that it could proceed from any other source. The best course for the spectators, in the operating theatre, is to observe a profound silence while the patient is present. It implies a sympathy for him, which he feels and appreciates, and which, judging from my own feelings, is most grateful to the operator.

Allow me also to suggest to those who engage in the labors of practical anatomy — and I trust that all will do so who are preparing themselves for the profession of medicine — the importance of doing it in such a way as to avoid offending, in the slightest degree, the public sentiment. While I feel that the dissection of the human body is essential to a thorough medical education, I am willing to acknowledge that it is necessity alone that can justify the practice. It is naturally repugnant to men's feelings; we are compelled, for the good of others, to overcome this aversion; and it requires, in the onset, no small degree of effort, with most people, to do it. We should be careful,

when we have overcome it, to conduct our investigations so as not to shock, in the slightest degree, the opinions of our fellow-men. It is due to ourselves, to our profession, and to the public, who permit this practice, that it should be thus done. We, as citizens of this commonwealth, owe it in an especial manner to the enlightened rulers of our state, who have sanctioned by law what in many parts of the world is done by stealth. A different course, while engaged in these pursuits, is very apt to blunt the moral sensibility; to make a man in some measure indifferent to human suffering, and thus tend in no small degree to disqualify him for the practice of the profession for which he is preparing himself.

There are one or two other points on which I intended to have said something; but, having already occupied so much time, I shall detain you but a little longer by enlarging upon them. I will notice them very briefly.

I would say, then, that it is desirable that every member of our profession should take a right view of the nature of it. I think that many err in this respect. Too many, I fear, look upon it merely as a means of obtaining a livelihood, and, perhaps, accumulating wealth. They seem to forget, when they enter on its practice, that they should devote themselves to the cause of science and humanity, and that the emolument that may arise from it, though not to be overlooked, should not be the primary object. We owe it to the great men who have gone before us, and who have done so much to adorn and dignify our calling — we owe it to them to labor for the enlargement of the boundaries of human knowledge. It should be our endeavor to add something to the accumulated wisdom of

past ages, and to aid in removing from our profession the character of uncertainty with which it is reproached.

We owe it to the cause of humanity to strive diligently for the advancement of our science. How much suffering still exists which we cannot lessen, or, at any rate, entirely remove! There are many diseases that are yet incurable, and many others over which we have no control.

I would not imply that physicians should in all cases practise their profession gratuitously, or for an inadequate compensation. I feel that they are entitled to an honorable reward, and that their services are not requited in our country as they should be, except, perhaps, in some of the large cities. If they were better rewarded, the profession would be cultivated with more liberal and enlarged views. Its practitioners would be relieved from the anxiety that many of them now feel as to their pecuniary concerns. They would then be able to give their undivided attention to the duties that are strictly professional. Their minds would not be engrossed to any extent by the ordinary occupations of life; and their thoughts would be chiefly directed to the care of the sick, and the acquisition of knowledge.

Many persons, when they enter on the practice, think too much of themselves, and too little of the profession to which they belong. They regard it as a trade, and not as a science. They made a mistake in the beginning; they selected it as they would any of the ordinary occupations of life, as a means of maintaining themselves and their families; and they set about doing this, overlooking the higher and more noble pursuits connected with their vocation. One thing is certain, that our profession, when followed in this way, will yield neither fame nor wealth.

Such of its members as adopt this course are very sure to reap nothing but disappointment, while at the same time they bring discredit on their professional brethren. Under any circumstances, it is the last calling which should be chosen in our community as leading to riches. If wealth, however, be not the object, no other occupation in life can hold out stronger motives for its cultivation. It engages the mind by the variety and interest of its studies; it presents a field for the exercise of the kind feelings of our nature, which is altogether peculiar to itself; it brings us most agreeably in contact with our fellow-men, and for the most part we escape the painful collisions which are experienced in almost every other path of life.

A few words more, and I have done. I cannot close without saying something as to the proper conduct of physicians towards each other. We are not regarded by the rest of the world as the most harmonious profession. We are supposed to be often jealous of each other's fame, and blind to each other's merit. We are thought to fall readily into unpleasant controversies, and to engage not unfrequently in personal altercations, from which no good and much evil is sure to follow. I could add to this list some other unpleasant charges that have been made against us. But this is not necessary for my purpose, which is merely to say something in palliation, and to warn you against the errors into which too many of your predecessors have fallen.

I admit that there is some degree of truth in these charges — far more than I wish. At the same time there are extenuating circumstances that are usually overlooked. We are peculiarly situated. For the first few years of our career, our characters and acquirements are often judged

of, and pronounced upon, by those who are wholly incompetent to form any opinion on the subject. Hence very erroneous decisions are frequently made. Men of small intellect and little learning, possessing none of the requisites of a judicious physician, by their plausible manners, or by some similar means, occasionally acquire extensive business and a certain degree of reputation, while men of modest merit pass along in undeserved obscurity. This is a state of things that is not likely to last, but for the time it engenders bad feelings. It may excite envy, perhaps, in the breasts of those who are conscious of superior attainments. They may indulge in detracting remarks in relation to their more successful rivals; and thus springs up an unkind feeling, that not unfrequently leads to discreditable controversies upon very slight provocations.

The members of the clerical and legal professions are differently situated. They come at once before the tribunal of the public. Competent judges pronounce upon their merits. From this there is no appeal; and in this decision all parties usually acquiesce.

I would not be understood, however, as attempting to justify or excuse in any degree the spirit of controversy with which medical men have been charged; at the same time I think it right to have suggested what may be regarded as palliating circumstances. Every motive urges to the adoption of a different course. We owe it to the honorable profession of which we are members. We have no right to sully the name of that calling whose objects are the advancement of science and the alleviation of human suffering. We cannot maintain its dignity, if we permit ourselves to lose sight of these.

We are bound to judge charitably of each other; to

avoid the expression of unkind opinions; knowing, as we do, the uncertainty of our art, and the slight control that we have in many cases upon their issue. We are bound to believe that every well-educated man, unless we know otherwise, has practised skilfully, be the result what it may; and we have no right to intimate that a different course would have produced a more favorable termination. Our self-respect requires this of us; our respect for our professional brethren imperiously demands it.

I trust that no one will enter on our calling who is not willing to adopt this course. He will not otherwise be a fellow-laborer in elevating its standard. He will do nothing to advance its honor. He will feel no interest in its true prosperity and welfare.

The members of our profession have a great work to perform, and great responsibilities rest upon them. If they do not feel this, if they are not willing to labor for its accomplishment and cannot bear these responsibilities, they should seek another occupation.

All of us should bear in mind that we have received, as a precious inheritance from the wise and the good men who have gone before us, the stores of wisdom that they have gathered up. We may not by our labors increase them; we may not even profit by them as we might; but if we cannot add lustre to the name of the profession of which we are the humble votaries, let it not be our reproach that we have done anything to tarnish it.

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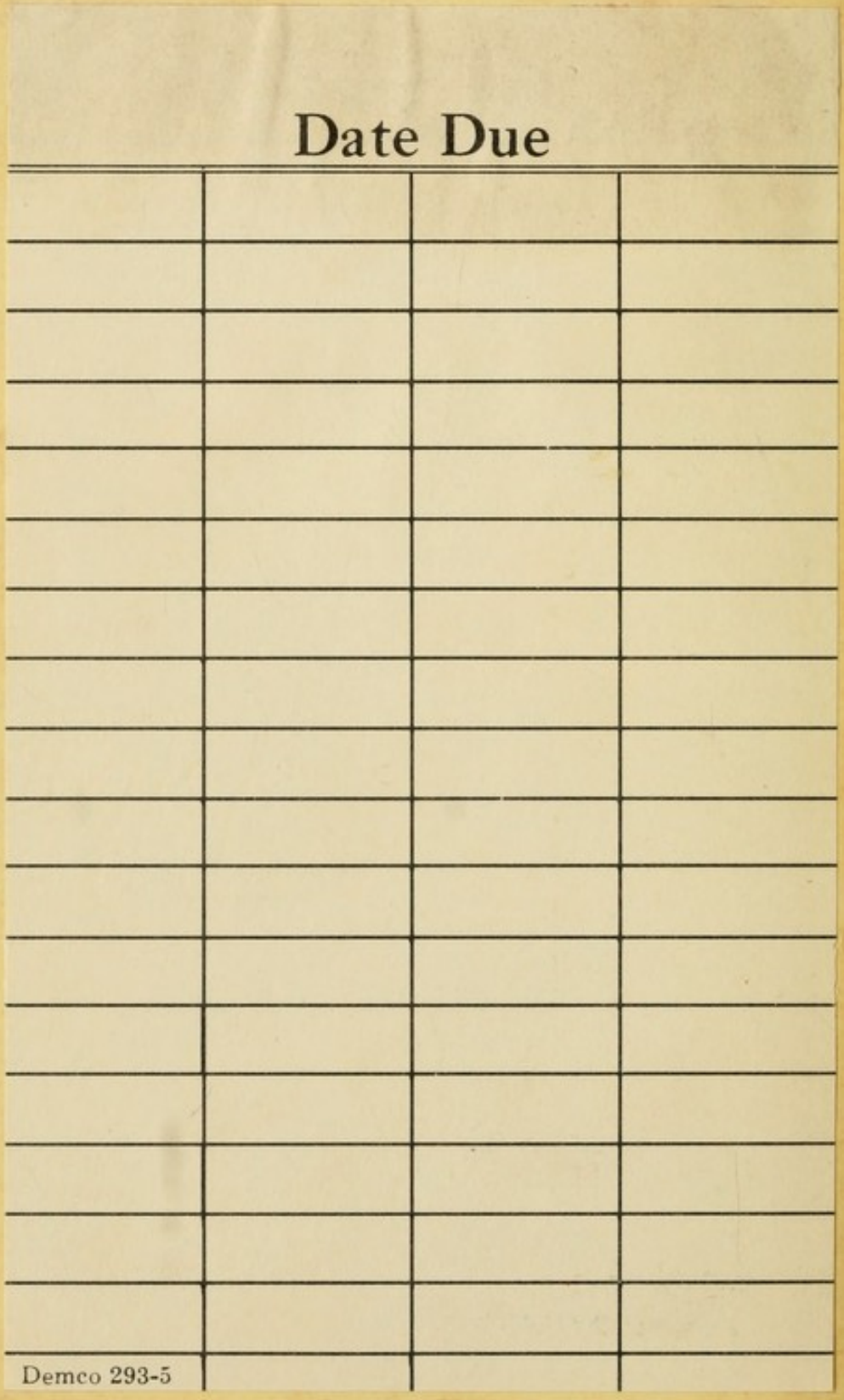

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