

corps were not well kept, and we can not be so positive concerning the number of cases.

44. *Army surgeons correctly diagnosed a little less than half the cases of typhoid fever.*

The total number of probable cases of typhoid fever among the regiments studied in Chickamauga was 9660. Of these 4068 were diagnosed typhoid fever either by regimental or hospital surgeons. Most of the cases improperly diagnosed were sent to general military hospitals, or to civil hospitals with the diagnosis, "malaria." In 80 out of 85 cases sent from the Fifth Maryland to civil hospitals in Baltimore, the diagnosis was changed from malaria to typhoid fever. Of 98 cases sent from the Eighth New York to hospitals in New York City, all were recognized as typhoid fever by the physicians in the hospitals, while the majority of these had been entered on sick reports under other diagnoses. The failure of regimental surgeons to properly diagnose many cases of typhoid fever is easily explained. Orders required, very properly, that every man sick for forty-eight hours should be sent to the division hospital. It will be seen from this that the cases were not under the observation of the regimental surgeon for a sufficient time for him to make a diagnosis. There is also some excuse for the failure of the surgeons at the division hospitals to recognize all the cases of typhoid fever. Many of the less severe of these cases remained in hospitals for a short time, and were furloughed home, or forwarded to some general hospital. Moreover, we have shown in the body of our report that, in recognizing nearly one-half the cases of typhoid fever, the army surgeon probably did better than the average physician throughout the country does in his private practice.

45. *The percentage of deaths among cases of typhoid fever was about 7.5.*

Of the 9660 cases already mentioned as occurring among certain troops at Chickamauga, 713 died. This gives a death-rate of 7.38 per cent. This corresponds closely with the death-rate for typhoid fever in those places in which most accurate records have been kept. In the city of Hamburg, during the years 1886-87, there were 10,923 cases with a death-rate of 8.5 per cent. Brandt has collected 19,017 cases treated by cold baths with a mortality of 7.8 per cent. Of 2293 cases treated in some of the larger hospitals in this country in 1897, 9.24 per cent. died. Further details concerning the mortality in typhoid fever are given in our report.

46. *When a command is thoroughly saturated with typhoid it is probable that from one-third to one-quarter of the men will be found susceptible to the disease.*

I am inclined to believe, but desire to state it as an opinion, that typhoid fever disappeared in some of the regiments only after all the susceptible material had been exhausted. This was probably true in all regiments which had 400 or more cases.

47. *In military practice typhoid fever is often apparently an intermittent disease.*

This fact is shown especially in the study of the Eighth New York. Please bear in mind that I state that typhoid fever is apparently an intermittent disease. I do not mean that the apparent intermissions are afebrile; I only mean that the men sick with this disease had periods of improvement which were so marked that regimental surgeons often returned the men to duty, probably at the request of the men themselves. We have discussed this very fully in our history of the Eighth New York.

48. *The belief that errors in diet with consequent gastric and intestinal catarrh induced typhoid fever is not supported by our investigations.*

This belief, which was formerly held by many, is founded on false conclusions arising from erroneous conceptions of the etiology of the disease. Moreover, the early symptoms of typhoid fever are often confounded with those of simple gastrointestinal catarrh.

49. *The belief that simple gastrointestinal disturbances predispose to typhoid fever is not supported by our investigations.*

The members of our board began their investigations with the belief, which seems to be quite generally held, that acute diseases of the gastrointestinal tract render the individual more susceptible to subsequent infection with typhoid fever. However, our studies have forced us to come to the following conclusions concerning the relation between typhoid fever and preceding temporary disorders, including those diagnosed as diarrhea, enteritis, gastroenteritis, gastroduodenitis, intestinal catarrh, gastrointestinal catarrh, gastric fever, and simple indigestion: *a.* The temporary gastrointestinal disturbances of May and June had but little if any effect on subsequent infection with typhoid fever. *b.* The temporary gastrointestinal disturbances of July and August, instead of predisposing to typhoid fever, gave a certain degree of immunity against subsequent infection with this disease. In our report we have attempted to give an explanation of this.

50. *More than 80 per cent. of the men who developed typhoid fever had no preceding intestinal disorder.*

In 2763 cases in which this point was especially investigated, 2356 were not preceded by any intestinal disorder.

51. *The deaths from typhoid fever were more than 80 per cent. of the total deaths.*

The percentage of deaths of typhoid fever to total deaths is not so high if we accept the diagnoses given in the official reports.

52. *The shortest period of incubation in typhoid fever is probably something under eight days.*

This statement is founded on data obtained by a study of typhoid fever among the hospital corps, men and women nurses at Chickamauga. The details are given in our report.

53. *One who has lived in a camp in which typhoid fever is prevalent is liable to develop this disease any time within eight weeks after leaving such a camp.*

The particulars bearing on this statement are given in our history of the Fifth Pennsylvania.

## SECTION ON PRACTICE OF MEDICINE.

ADDRESS OF THE CHAIRMAN.\*

BY GEORGE DOCK, M.D.

ANN ARBOR, MICH.

We meet again for the consideration of a well-filled program. The number of papers is considerably less than last year, but is still so large that, allowing for the usual proportion of authors unavoidably prevented from appearing, our time must be economically used in order to get through. An effort has been made to group papers on allied topics so that the discussion may be directed to the series, and repetition avoided in that way. In most cases the topics for the groups were arranged

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by the officers of the Section. Other set discussions on chosen topics were projected, but for various reasons could not be carried out as planned. The officers of the Section take not a little pride in the large number of abstracts and synopses published in the program. The utility of these in preparing members of the Section for the best appreciation of papers, and in bringing out pertinent comments and criticisms, seems obvious. For the benefit of future progress, attention may be called to the advantage of making the abstracts as short as possible. This can be done better by the author than by the Section officers or the editor of THE JOURNAL. It would seem that about 100 words should be the limit.

The number of papers on our program leads to the question whether it is not advisable to form a new Section, in order to take up part of the work, and interest will naturally be directed to the unofficial Section on Pathology, of whose existence you already know. There are a number of thoughts that may be expressed in this connection. In general, it seems better to have as few sections as possible in an association made up, as this one is, largely of general practitioners. Yet such is the amount of material that specialization is certain to press its claims in various directions. So far as the proposed new one is concerned, there is a doubt in the minds of some as to the scope intended, due to the various meanings given the term "pathology" and also to the activity of the Section officers. If we take away from the existing Sections on special pathology and therapeutics all their papers devoted to pathologic topics, and place these in a group by themselves, we emasculate the former. Perhaps there is no greater need, not only in medicine, but also in surgery, gynecology and various other branches, than the constant repetition of the principles of pathology, the assertion of the anatomic, physiologic and chemical basis of diseases and the cultivation of positive standpoints in these branches. For the specialist in pathology, such a section might doubtless be a source of much interest, but even he might gain something by annual contact with the clinical workers in hospital and general practice, that he would not find in a special section.

On the other hand, a section devoted to experimental pathology might be useful, still more so one in which general pathologic problems might be considered and where, in addition, specimens might be exhibited, methods demonstrated and apparatus shown. So far as the exhibition of anatomic specimens is concerned, it seems to the speaker that these should be selected with special reference to their importance in pathology or to the method of preparation or preservation. With energetic Section officers, such as were wisely selected for this year, the results would be of great value. It might also be useful to limit the source of such specimens each year to the section of country in which the meeting is held. In this way not only would the labor, expense and risk of distant transportation be avoided, but a general cultivation of anatomic work excited, and, combined with a practical exhibition of apparatus, a more rapid diffusion of methods of all kinds set up.

The chairman of a Section in the year completing a century should be pardoned if he falls into the mood natural to such an epoch. At the end of this century, nothing could be more agreeable than to recount the great discoveries that have made it, in medicine, more interesting than any that have gone before. But all these things have been told and retold by more eloquent tongues,

and there is another operation that is often more useful though not so pleasant—the examination of the past with a view to facing the future with more certain glance. Socrates held that an unexamined life was not worth living. The same thought might be applied to a profession, and although I would not give the impression that, like Socrates, I have a divine command to examine medicine, the chair in which your favor has placed me may be held responsible for any seeming impiety on my part for attempting it.

Not long ago, in talking with a master of one of its most successful technical subdivisions, my friend remarked that medicine was becoming daily more easy. Against the word "easy" I had to protest, though realizing what was meant. So far from growing easier, the art as well as the science of medicine grows daily more difficult. It is more certain, more thorough, more far-seeing and more far-reaching than ever before, but it requires of its votaries more knowledge, more technical dexterity, greater expenditure of time and greater lucidity of judgment than ever before. We have only to point to any one of the commonest diseases to make this clear. Take a case of typhoid or malarial fever, or of pulmonary tuberculosis, and consider the numerous things to be done and to be thought about that twenty years ago were as far from our minds as was Aristotle's treatise on the constitution of Athens.

It is an interesting and to some a discouraging fact that, although medicine has made most remarkable improvements in this century, its influence over the layman seems less than before and waning rapidly. While it is becoming more positive, more candid, more accurate, the grossest delusions flourish. Not only the plausible nostrum-maker, but the palmist, the astrologer and the ridiculous therapeutic claims of a dozen half-crazed brains have their believers by the thousand. Not many years ago a favorite theme of semiscientific poets was the prediction of a rapidly approaching golden age, when the physician, trained in biologic laws, should occupy the place once held by priests and augurs, but wield his authority only for good ends. Failure in the consummation of this ideal need not make us despair of human nature. In a time of rapid advance it must happen that great differences exist between the trained and the untrained. Moreover, this is an age with little respect for authority. Not only now as before, *irrt der Mensch so lang er strebt*, but it is perhaps well for medicine that people no longer look on its real proficient with the faith of the savage in his medicine-man. Healthy skepticism can do us no harm, and we must remember that with all our advances we still have about us some relics of medievalism. The subject, however, is rather one for the psychologist than the physician, and at this time may be passed over for the consideration of one that affects us more directly, and we may venture to raise the question whether we have used to the best advantage the talents given us by this century, and whether we are likely to be prepared as well as possible for the revelations of the next. A few examples may be considered.

In the first decade of our century Corvisart again gave to the world what the preceding century had rejected. His translation of Auenbrugger's invention of percussion, enriched by his own brilliant commentaries, was soon enlarged and controlled by master minds in every country. For half a century this has been a method of undisputed value in the determination of the

existence and extent of a large number of important diseases. In the second decade Laennec opened up a new world with the stethoscope. This has been explored by all the great physicians of the last seventy-five years, in the face of argument and ridicule, and, with percussion, has helped to call attention to the value of inspection and other so-called physical methods of diagnosis, but how often do we see them all entirely neglected or carelessly used. Not only is the routine examination of the body frequently left undone, but even with marked symptoms on the part of the various organs accessible by these methods, either no examination is made, or it is made in a manner that would be ludicrous if the results were not often most serious. A striking example of neglect of physical examination recently came to my notice. One of my assistants found that a man who consulted him had a complete transposition of the viscera. The manipulations excited the patient's interest, and when he was told the state of affairs said he had been examined seven times for life insurance and been treated once for pleurisy, in a large city hospital, without having the condition discovered. In the third decade Bright showed the relation of albuminuria to kidney disease, and in the fifth Henle and others made clear the diagnostic importance of tube-casts. Though the actual value of these two discoveries has often been exaggerated, they are still essential in diagnosis, but how often are they neglected. Perhaps few fail to make use of tests for albumin in cases in which certain diseases are suspected, yet, as a routine measure, they are often omitted. As to casts and also other substances in the urine, such as blood, pus, and pathogenic bacteria, many physicians are as if these things had never been.

It is not difficult to explain the reasons for this state of affairs. One is indolence, but the most important is that the methods have not been acquired at the medical school; perhaps some of them have not even been seen by the helpless student. Even if the methods have been learned, the student often has not the fundamental knowledge that diagnosis means more than the naming of a disease. Satisfied if he recognizes, even vaguely, one clinical picture in a sick man, he fails to retain or acquire a mastery of diagnostic measures. The condition depends in turn partly on the absurdly large number of medical schools in the country. With from six to seven score of these the obtaining of students must be a more important matter than their training. One of the most certain hopes of the new century is that, comparatively early, many of the superfluous schools will become extinct. Along with concentration of labor in the schools and improvement in the previous preparation of students, we can confidently expect a notable change for the better in methods of teaching, for there has probably never been a time when teachers of medicine, as well as undergraduate students, were so critical in regard to methods as now.

Another topic worthy of examination is that relating to the more instrumental part of diagnosis—a thing that has within a short time assumed important proportions, but the various relations of which are often neglected. It is here especially that apparent ease tempts to superficial examination of the sick.

The many manipulations included under the general head of laboratory examinations vary so much in difficulty, in certainty and in weight as evidence that it is only natural that mistakes occur, yet these are so

vital that those concerned should be constantly on the alert to guard against them. How difficult it is to measure the importance of each laboratory fact in itself is often illustrated in practice. I have known of a surgeon being told that in a certain case an enlarged spleen was part of a leukemic process, and with the remark that he believed "clinical observation more trustworthy than instrumental diagnosis," he proceeded to open the abdomen. Another time the report on a sputum examination for tubercle bacilli is negative, but now, instead of relying on the clinical examination, too often sufficient, the patient is allowed to go on as if the negative examination had the same value in one case as a positive one in another. How often is it forgotten that laboratory methods must be learned as separately as any other specialty. No one would think that ability to feel alterations in the pelvic organs gives facility in the interpretation of ophthalmoscopic pictures, yet how often is it taken for granted that one who can cultivate tubercle bacilli can, without practice, detect malarial parasites, or that one who can see tube-casts can also be infallible in the microscopic distinction of primary and secondary anemias.

No doubt the unprepared but ambitious laboratory expert is partly responsible for the present state of affairs, but it would seem that the physician who calls on such an expert should select him with as much thought as he would an operating specialist. Often, too, the physician could control the work of the expert, either by asking for the proof or an explanation of the steps followed. Some time ago a bottle of specimens came to me after making the rounds of half a dozen microscopists. All the previous examiners asserted that the specimens were animal parasites, and their appearance to the naked eye—small, black, thread-like bodies, as they were—made this seem probable. A glance was enough to show that in fact they were the well-known vegetable spirals, the cause of error to so many microscopists in the last fifty years. Some comparisons made it practically certain that the tissue came from bananas. Yet this discovery, so easy to control, was ignored by those in charge. By a curious coincidence the patient herself came under my observation many months later, and on hearing my statement about the specimens, admitted an excessive consumption of bananas, the cause of so much trouble.

When the position and limitations of the laboratory worker are more clearly understood, his remuneration will be better regulated than now. In many places he will be part of a hospital staff, in a laboratory equipped for all kinds of work. In others he will have his private laboratory, and in still others, where the field is not so large, he will have the less brilliant, but not less useful and perhaps more interesting position of assistant to a busy practitioner of broad views.

An examination of the status of another great division of our art, that of therapeutics, is also well worth while in the last days of the century. In materia medica, this century, especially in the latter part, has been prodigal if not discerning. The extraordinary activity in the production of new drugs, though it may give us some that far outrank poppy and mandragora, also makes more difficult the judgment so essential to rational practice. So confused are our standards that it is often impossible to distinguish the wares of the professor of chemistry or pharmacology from those of the modern seekers after the philosopher's stone. In addi-

tion to the products of synthetic chemistry we have a new field in the long-unused animal kingdom. Here constant examination is necessary. It is not easy for the busy man to see how the so-called lymph of an alleged goat should not be as potent as thyroid extract. Serum, too, is a word that suggests potentialities of many kinds, though so widely applied that Virchow's jocular definition—"Serum is any fluid that is not precisely urine"—seems peculiarly apt. One hopes that the end is near when discoverers are driven to such names as "hydrogogin" and "anusol," but the possibilities of the prefix "eu" temper the hope considerably.

No doubt the commercialism of the day is partly responsible for the present state of this branch of medicine, but the medical profession has a heavy load of guilt. I am credibly informed that in a large factory of preparations used only by the profession, thirty clerks are kept busy answering letters from doctors in regard to the treatment of particular cases in practice. These clerks make no pretense to a knowledge of medicine, or even of drugs. They have their trade catalogue, from which they readily secure the desired information. But will this tendency stop with therapeutic problems? Will not diagnostic and pathologic questions also be given the manufacturing pharmacist for solution, and will he be so blind to his own interest as to remain silent? We can gather some idea of this in some recent literature on the important subject of vaccination, a subject strangely neglected in medical schools and scientific laboratories. In this we learn of *vaccinia sine eruptione* as a satisfactory explanation of what would strike a critical observer as a complete failure of the virus. No wonder that "a boy living in the infected district," who performs the operation, is put forth as a witness concerning a matter of which Jenner himself might not be competent to judge.

Therapeutic false prophets will last long into the twentieth century, but the examined, criticised life then, as ever since the days of Hippocrates, will be but little influenced by them. To it, "they come like water and like wind they go."

#### IMPROVED METHODS AND DETAILS IN THE CARE OF PATIENTS DURING SURGICAL OPERATIONS.

BY FENTON B. TURCK, M.D.

CHICAGO.

Surgery has reached so high a state of perfection in technique, in toilet and in the care of the patient before and during operation; that there would seem to be nothing left for improvement. Notwithstanding our apparently perfect precautions, however, the surgeon occasionally loses cases through septic infection, shock or other causes.

In the case of septic infection, the surgeon is bewildered in the attempt to determine the source of infection. "The operation is successful but the patient dies," sometimes as the result of infection, sometimes from shock, oftentimes from both. The object of this preliminary report is to present a few facts that may indicate some of the subtle causes of infection and shock occurring, though all the usual precautions have been taken. In operating on the abdomen, the skin is found to be a source of infection. Welch and others have clearly shown that bacteria are still found in the skin, even after all the usual preparations have been made. I have made a number of cultures from the skin

before and after operations by various surgeons, as well as in cases of my own. The method was to take cultures from the operative area after the usual aseptic preparations of the skin had been made. After the incision cultures were made from the wound and from the peritoneal cavity. The operation completed, cultures were made from the superficial area, the skin, the deeper connective-tissue layer, the peritoneal cavity and the laparotomy sheets and towels. The result of the bacteriologic investigation was positive in each case and confirmed the observations made by others. The detailed results of my bacteriologic work are reserved for a more complete report.

The laparotomy sheets and towels, as they become wet, are capable of transmitting infection from the field to the edge of the wound and peritoneal cavity. The indications are, therefore: 1, to prevent, as far as possible, infection from the skin and contact with the skin, with the hands, instruments, sponges, etc.; 2, to protect the skin from becoming contaminated by pus or visceral contents. To meet these indications I have devised an improved laparotomy sheet made from thin rubber dam which is fitted close to the body and is illustrated by the accompanying cut (Fig. 1).

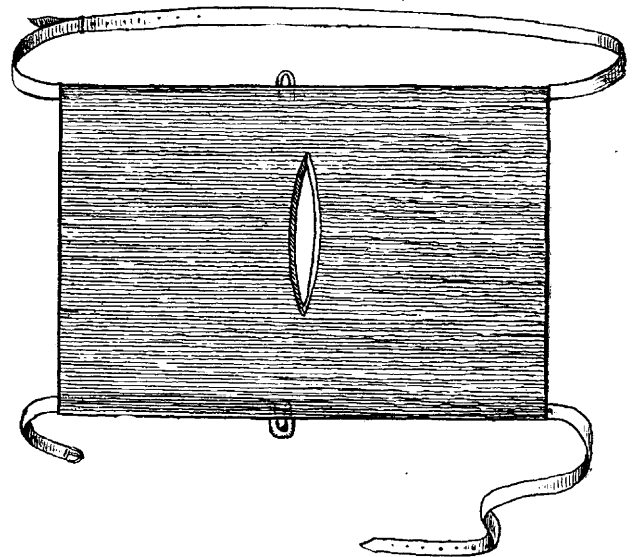


FIGURE 1.

The advantages of this rubber protective are that it not only lessens the danger of infection from the skin, but prevents the latter from becoming contaminated. It also prevents the loss of heat by evaporation from the exposed area of the body, thus lessening danger of shock. The use of the protective does not prohibit the additional use of the linen laparotomy sheet. The former is so arranged as to fit closely and does not interfere with the field of operation.

Some surgeons consider it necessary to protect the edges of the wound by suturing the peritoneum to the skin. This requires considerable time, and as the stitches are usually placed at some distance from each other, the edges are not entirely protected. If the rubber sheet be folded and under the edges of the wound, it may be clamped and held in position after the removal of the hemostatic forceps; the clamps act at the same time as self-retaining retractors, which may be used at any moment. This is shown in Figs. 3 and 3a.

Having presented methods for protecting the viscera from infection by the skin, the next important consider-