

later. Dieulafoy and Bard<sup>5</sup> have each practised this method in pneumonia, with recovery in both cases. Others in France have also used it a few times, but I have not been able to get access to the journals in which the reports appeared.

In three desperate cases in my service at the Massachusetts Hospital, this winter, I had turpentine injected, in one case on the ninth, in two on the seventh day of the disease. All three died, as seemed certain that they would, whatever was done or not done. I do not think that these cases should really count for, or against the method.

For therapeutic purposes cases of pneumonia may be divided into three classes. First in frequency are those cases which will recover under any treatment or no treatment, unless they are grossly mismanaged; second, those which will die in spite of any and all treatment known at present; third, those in which judicious treatment may turn the scale.

Our object is constantly to strive to enlarge the third class at the expense of the second. Thus far, our efforts have been unsuccessful enough, it must be admitted. But, however sceptical we may be, we should not be hopeless, or refuse to listen to those who bring forward new methods, with an underlying basis of reason and fact. One method of curative treatment has been recently introduced which can claim an encouraging though limited success in practice, as well as foundation in analogy — with tetanus, for instance. Only one case has been reported thus treated in this country, but it would seem our duty to lose no further time, and I propose to test the method in my wards next autumn and winter.

I refer to the injection of blood serum from a human being who has recently passed the crisis of pneumonia, or blood serum or fluid derived from animals rendered immune to experimental pneumonia by the injection of pneumococcus cultures. I will not take your time by going into the details of this method and its technique. The articles of the Klemperers,<sup>6</sup> and others in Germany and Italy who have tried it, are accessible enough. Suffice it to say that the purpose is to induce the crisis artificially, and that of thirty-nine cases thus treated, collected for me from literature by Dr. R. C. Cabot, all save one recovered. Whether the pneumotoxin and antipneumotoxin theory of its mode of action is final or not, remains to be seen. In the sole American case<sup>7</sup> defibrinated blood was used, with results which do not encourage a second trial.

## THE RELATION OF HOSPITALS TO MEDICAL EDUCATION.<sup>1</sup>

BY HENRY M. HURD, M.D.,  
Superintendent of the Johns Hopkins Hospital.

It is not my purpose to argue the duty of hospitals to promote medical teaching. They have always contributed to it and always will, in an increasing degree, as medical education becomes better organized and more efficient. The hospital, whether avowedly so or not, has always been a school of medicine, sometimes

to the few who were attending physicians, resident physicians or internes, and sometimes and now, I am glad to say, more often to those who are pursuing medical studies. The relation of hospitals to medical education has been reciprocal for good. Medical teaching has improved hospital work and hospital work, on the other hand, has improved medical teaching. Neither can exist without the other. It is my purpose, in this brief paper, to point out methods whereby hospitals can best subserve medical teaching and to emphasize the duty of promoting it. A hospital which does not contribute to the advancement of medical knowledge by bringing the results of its investigations and experience to the training of medical students in the plastic stage of their education, fails to attain its highest good or to surround itself with the brightest investigators. The duty being apparent, to point out the best method of attaining the desired end must be the sole object of the present inquiry.

(1) *Pathological Institutes.* — First in importance I would place the organization of a good pathological institute in connection with every hospital. By this I mean much more than an autopsy room and a museum for the preservation of morbid specimens. These are valuable, but their work is not of prime importance compared with what may be accomplished by systematic investigations in all branches of pathological study. Facilities should be afforded for the study of every morbid product. There should be opportunities for systematic bacteriological examination of pus, serous effusions, the products of inflammation, the bodily secretions and excretions, false membranes, new growths and the like. The diagnosis of diphtheria and of follicular tonsillitis, for example, should here be made by cultures, cover-slip preparations and the microscope. The different forms of peritonitis should be differentiated similarly. The effusions of pleurisy should be studied bacteriologically to determine the presence or absence of the tubercle bacillus. Malarial fever should be differentiated from other forms of continued fever by the presence of the plasmodium. The micrococcus lanceolatus, otherwise known as the pneumococcus, should be searched for in pneumonia and cerebro-spinal meningitis. Such studies are impossible unless rooms are provided, specially fitted up with apparatus, instruments and trained observers constantly at hand for the purpose. These studies give a definiteness to diagnosis by excluding possible diseases of other origin; and certainty to prognosis.

The microscopic study of tumors and new growths while an operation is in progress and before its completion, is of equal value. Three examples drawn from actual occurrences in a Baltimore hospital, will serve to make my meaning clearer. A patient with a suspicious abdominal tumor, presumably malignant, had submitted to an exploratory operation and a frozen section, while she was on the operating table and before the operation was completed, showed the growth to be tubercular in character. The cavity of the abdomen was drained and washed out with a sterilized salt solution and the patient made a good recovery. A second patient seemed to be suffering from a simple abscess of the breast, but a bacteriological examination of the contents of the abscess cavity showed that the inflammation was tubercular in character and led to the examination of the surrounding tissues, which were found to be filled with tubercle bacilli. A radical operation for the removal of these diseased tissues

<sup>1</sup> Read before the Hospital Section of the International Congress of Charities, Correction and Philanthropy at Chicago, June 12, 1893.

<sup>5</sup> *Lyon Médicale*, 1892, p. 533.

<sup>6</sup> Berliner Klin. Wochens., 1891, p. 833, and Wiener Med. Wochens., 1892, No. 22. Niesser: Deutsch. Med. Wochens., 1893, p. 593. Lara: Wien. Med. Wochens., 1893, No. 12. Bozzolo, *ibid*.

<sup>7</sup> Hughes and Carter, *Therapeutic Gazette*, October, 1892.

then followed and a condition was found present which justified a grave prognosis. In another case a culture made during a severe abdominal operation, subsequently showed that a chronic peritonitis had been caused by a virulent streptococcus and led immediately to the isolation and separate nursing of the patient to prevent the infection of the ward. Such instances are of daily occurrence and the wisdom of these expert examinations is fully established by repeated experience.

In dressings, also, subsequent to surgical operations, similar sources of infection are revealed by bacteriological examinations; and the communication of infection to other patients may be prevented by the knowledge thus acquired. This work, while of prime importance, ought not to impede the true work of a pathological laboratory, which is to study the origin, course and effects of disease upon every organ of the human body. Every large hospital ought to have a paid pathologist, whose whole time should be given to this form of study and he should be provided with a sufficient number of assistants to do this work thoroughly. Diseased tissues and organs should be examined in gross at the autopsy table and afterwards the material should be studied in frozen sections and by hardened specimens. Cultures should also be made post-mortem of all products of inflammation to determine their precise character. These studies clear up obscure diagnoses and lead to the more successful treatment of other cases.

(2) *Clinical Laboratories.*—Every hospital ought also to have a clinical laboratory for blood examination, urinary analysis, the examination of the stomach contents and the examination of feces and sputum. The blood should be examined, as a matter of routine, in all forms of wasting disease. The value of the methods of Ehrlich in the different forms of leukæmia is attested daily by practical observation. The differentiation of malarial from typhoid or other forms of continued fever, is frequently only possible when the plasmodium has been demonstrated in the blood. The importance of a bacteriological examination of cholera stools for the presence of the comma bacillus, has been recently demonstrated in the late cholera epidemic in Europe. The equal importance of searching dysenteric stools for the presence of *amœbæ coli* has been demonstrated many times in the Clinical Laboratory of the Johns Hopkins Hospital during the past year. Abscesses in the liver and lungs and one jaw abscess have thus been shown to be dependent upon this protozoan. The confusion which exists in the profession to-day, regarding malarial hæmaturia, can only be cleared up by similar expert examinations. In such clinical laboratories syphilis often needs to be differentiated from tuberculosis by the microscope. Skin affections also, like urticaria, favus, the different forms of dermatitis, tinea versicolor and tuberculosis need to be similarly studied. The presence of the otomycosis *aspergillus* in ear affections can only be definitely shown by the microscope. The tetanus bacillus, the streptococcus of erysipelas, the staphylococcus of suppuration and the pneumococcus of pneumonia and meningitis should also be similarly demonstrated when present. In no other manner can medical education be made definite and thorough. The day of theories and brilliant hypotheses to account for many of these diseases is past and demonstration ought to replace them.

(3) *Operating Rooms.*—Every hospital of any

size, and especially a hospital to which medical students have access, should have surgical operating rooms arranged for carrying out a perfect surgical technique. Here should be consistent and constant efforts to reduce the danger to patients from the infection of wounds to the minimum. These operating rooms should be object lessons in thorough surgical cleanliness. There should be apparatus for hand disinfection and facilities for scrubbing and cleansing the hands. Every step in the technique of antiseptic surgery should be carefully prescribed and followed. It is now evident that infection of wounds does not come through the air or from atmospheric conditions, but rather from actual contact. Pus-producing germs gain access to wounds at the hands of the operator or his assistants or by infected instruments or ligatures or through infected skin-stitches or by subsequent dressings. Hence, it is of the utmost importance that the technique pursued in every hospital operating room be thorough and consistent to the end that every person may know the reason of the procedures adopted. Students and physicians should be trained to appreciate understandingly what is harmful and to be avoided and what is harmless and permissible. It may be asserted with confidence of no successful contradiction that, in the technique of many surgeons, unnecessary precautions are frequently taken and necessary precautions are as frequently omitted from a lack of adequate knowledge of the true sources of infection. These can only be adequately taught by bacteriological methods. Ligatures, instruments, bandages and all forms of dressings should be sterilized in such a way as to meet every bacteriological requirement. Cultures taken from the first dressings, made subsequent to an operation, should not grow upon any form of culture media. Experiments which have been made in wound infection have clearly demonstrated its sources and its methods of prevention. Each operating room should be as carefully arranged to carry out antiseptic precautions as the laboratory of the bacteriologist. More than this may also be asserted. Every operating room ought to pursue careful and systematic experiments upon hand disinfection. No one believes that an ideal excellence has yet been attained. These fruitful experiments are alone possible in large operating rooms with frequent operations and abundant facilities for carrying on the work thoroughly. It is most gratifying to call to your attention the fact that two large operating rooms have lately been constructed in New York with every facility for this systematic work. If they contribute, as they undoubtedly will, to the simplification and perfection of surgical technique, their erection will fully justify the outlay, as large as it may seem to the unthinking critic.

(4) *Photographic Rooms.*—An equally important part of the educational outfit of a general hospital should be a well-constructed and well-arranged room for photography. Here medical men should be trained to do photographic work in the various departments of hospital service. Each man should be taught the manipulation of cameras and photographic plates, and should learn methods of developing, printing, enlarging, etc. Photo-micrography has proven a very disappointing branch of photography. A poor drawing which accurately portrays what the observer sees is generally much to be preferred to the most finely finished microphotograph with its blotches of color and flattened surface. Not so, however, with what may be termed

gross medical photography. Its field of usefulness is apparently limitless. Many surgical conditions should be photographed upon the spot, even while an operation is in progress. The rapidity and accuracy with which newly-discovered or newly-recognized forms of disease have been made known to the medical public, are well shown by the disease known as acromegaly. Although this disease was first differentiated and described by Marie, in 1886, its peculiar *facies* became at once familiar to physicians throughout the world by the excellent photographic reproductions which were distributed, and to-day it is easily recognized wherever found by medical men who have never been shown a case. In a similar manner cases of myxœdema and the various forms of paralysis have been accurately portrayed, to the great advantage of the student of medicine. Photographs of skin diseases, deformities, muscular atrophies and hypertrophies, ulcers, tumors, aneurisms, surgical operations, surgical methods and surgical dressings, perpetuate these conditions much more clearly and satisfactorily than pages of description. In many instances these representations are sufficient to enable the observer who has not seen the case to confirm the diagnosis.

(5) *Charts and Graphic Representations; Histories.* — Allied to photography are the various forms of charts and graphic representations. These should be made with absolute accuracy and regularity, and should form permanent records in the hospital. The same is true of medical histories, which ought to be made up daily at the bedside. Such medical histories should be classified, indexed, catalogued and rendered accessible so that any fact of medical interest may be referred to at a moment's notice. There should be a medical staff large enough to do this work thoroughly well. The influence of these careful records upon medical knowledge can hardly be estimated; their greater influence in training medical men connected with hospitals, to habits of careful, painstaking, exhaustive observation and faithful records of the same, is undeniable.

(6) *Dispensary Work.* — The position of carefully conducted medical work in dispensaries or departments for out-patients in training medical men is well recognized. The patients who present themselves for treatment at these clinics, more nearly represent the patients with whom physicians come into daily contact than ordinary hospital patients. Hence the same necessity in dispensary practice of training students in habits of quick, accurate and thorough diagnosis and of painstaking records of the clinical facts which are obtained. Clinical methods and clinical records ought to be as systematic and complete in the dispensary as in the hospital. The facilities afforded by a dispensary for the study of physical diagnosis are, if anything, more valuable than those of a hospital. The same is true of the opportunity for learning the methods of diagnosis in minor surgery and the application of the ordinary surgical dressings. Practical work in the diagnosis and treatment of diseases of women is here feasible, and under competent supervision often proves most valuable. The opportunities for studying the specialties of medical practice are also of extreme value and should be utilized regularly. Every department of a dispensary ought to be under competent expert medical supervision, and all branches should be so conducted as to promote the training of students. The practical difficulty in many dispensaries is that the clinical material is not properly utilized.

(7) *Libraries, Reading-Rooms, Societies and Journal Clubs.* — Every hospital should foster a good medical library and a reading-room filled with the best and latest medical periodicals, and all members of the staff should be expected to use them, and should have time to do so. In most hospitals the medical men are sadly overworked, and through a superabundance of routine work lose all time, and too often all inclination, for medical reading or study. The advantages of a medical society and of a journal club are too obvious to require more than a mere brief mention. These organizations should exist in the staff of every large hospital.

(8) *Medical Staff.* — A careful consideration of the subject leads me to urge that all large hospitals be furnished with an increased medical staff, and that the terms of service of a portion, at least, of the medical men be considerably increased. It is evident to all who have watched hospital work, that the usual term of service extending over a period of twelve, sixteen, or eighteen months, brings active young men fresh from medical schools into hospitals to send them out to give place to other inexperienced young men about the time they are fitted to do independent work. The hospital, consequently, suffers from the mistakes which they make while they are receiving training, and by an inexorable rule loses their services as soon as they are fairly well trained to do efficient and fruitful work. This difficulty would be removed if arrangements could be made to give all fourth-year medical students routine hospital duties under competent supervision. This would train them in practical work to such an extent that when they assumed hospital appointments they would be fitted to undertake independent work, and could supervise the work of other fourth-year men wisely. In each department of hospital service a chief resident should be appointed whose term of service should extend over a period of at least three years. This would enable him to fit himself thoroughly for giving instruction to all assistant resident physicians, and to wisely direct their work. Such service is possible in European hospitals, and if a similar service could be inaugurated in the leading hospitals of this country it would mark a decided advance in hospital work.

In conclusion, I would urge the duty upon every hospital of doing every branch of hospital work as well and as thoroughly as it can possibly be done. If philanthropy recognizes it to be a duty to care for the sick poor and to minister to their comfort by convenient, well-appointed, well-ventilated and well-warmed apartments, the same duty demands that their medical care shall be equally thorough, painstaking and scientific. The best should be constantly striven for; and nothing but the best should satisfy those who are charged with their care. Every hospital should be an object-lesson in the proper care of the sick. It should demonstrate the best methods of medicine, surgery and gynecology, the most approved nursing, the best cooking for invalids and their kindest care.

In India, 21,389 persons were killed by snakes in 1891, as compared with 21,361 in 1890. It is said that in many places in India snakes are bred with the object of getting the government reward for all snakes killed. The abuse is so great that it is proposed to abolish the system of rewards.