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## *Original Contributions.*

### RECENT PATHOLOGICAL STUDIES OF THE BLOOD.\*

BY L. H. WARNER, A.M., PH.D., M.D., BROOKLYN, N.Y.

THE important and constantly growing branch of medicine which deals with the prevention and aids to the cure of disease, depends no less upon signs for tracking the dependence of one event upon another as the essence of indicative signs. All the efficient measures for the preservation of health, whether by individuals or committees, rests upon the exact knowledge of the natural cause of diseases. The fact is, disease may be defined as the reaction of the human organism under conditions which caused its destruction. In the course of these events there is one aspect of scientific medicine so important that it must be given due consideration—that is, the necessity of experiments for the progress of pathology and through it for the prevention and cure of disease.

It requires no argument to convince the most egotistical practitioner who is the least acquainted with the principles of indicative signs, that experiments are no less necessary than observations. In physiological and chemical laboratories it is obviously and universally acted upon. These methods are indispensable for the progress of animal and vegetable philosophy and to the practical application of science known as medicine. Experiments must be carried on in large numbers and by a variety of experiments and under every variety of conditions in order to become valuable. The tendency of some to retard or abolish experimental work is

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\*Read at the Meeting of the Canadian Medical Association at Ottawa, September, 1900.

fatal towards the rapid progress which has been made in the department of medicine and surgery in years past.

Upon the results depending upon researches in physiology and pathology, depend the progress made in the field of therapeutics. The progress in pathology made in recent years in reference to its analysis of the nature of tissue changes, has been influenced to a considerable degree by the progress made in bacteriology.

Pathology not only explains why certain changes and its causes occur within the organism, but it also explains the particular alteration in one tissue and the change in another instance. Microscopical and experimental analyses have been active in discovering fundamental facts, and gaps which a few years ago were left open by pathology, have been covered since the knowledge of bacteriology has been established.

Experimentations in order to be of benefit in the department of medicine and surgery, must embrace three lines of inquiry: First, an experimentation upon lower animals: second, statistical observations of the results of treatment, and third, individual observation at the bedside in clinics and hospitals.

Of great help in the advancement in pathology and bacteriology has been the work done in the biological laboratories independent of any medical college or hospital. The labors of physiologists and pharmacologists and organic chemists have given us results which enable us to give a more interesting and practical and useful course of lectures on materia medica and therapeutics than we have been able to do in previous years.

Amongst the recent advancing steps in pathology, we have had an opportunity to get a thorough glance at the perfect understanding of hematology, and we have learned to know that in most cases the examination of the blood is the most important factor, that in fact it is more important than the examination of the urine, and it is already an acknowledged fact that the examination of the urine is necessary in each and every case.

Referring to the very latest text-books on physiology, we learn that the inorganic salts of the urine consist chiefly of the chlorides, phosphates and sulphates of the alkalies and alkaline earths, that they arise partly from the salts ingested with the food, which salts are eliminated from the blood by the kidneys in the water secretion, and in part they are formed in the destructive metabolism which takes place in the body, particularly that involving the proteids and related bodies. Referring especially to the phosphates, we learn that they come in part from the destruction of phosphorus-containing tissues in the body, but chiefly from the phosphates of the food.

These teachings seem to demonstrate the inaccuracy derived solely from an examination of the urine. Analyzing the foregoing statements as laid down by our text-books, I desire to comment upon them as follows: that should the phosphates of the urine be chiefly from the phosphates of the food, it would naturally involv

a diseased condition of the organism. More or less of the food is taken into the body in the form of organic substances, or in the process of preparing the food they have been converted into inorganic elements. Elements of both classes, when coming in contact with the secretions of the stomach and intestines, will undergo a further change—a change which will cause them to be presented in such form as to be easily incorporated into the lymph and chyle and thus to enter the blood circulation. The escape of the phosphates, whether organic or inorganic, by any other channel, would demonstrate to us an abnormal absorptive or resorptive process.

If, on the other hand, the phosphates are derived from the destruction of phosphorus-containing tissues, we must first of all consider that the true phosphorus-containing tissues of the animal organism are the leucocytes. Thus the appearance of an abnormal amount of phosphates in the urine would demonstrate the destructive process which is going on in the polynuclear leucocytes.

Whenever there is doubt regarding the origin of the appearance of phosphates in the urine, it is rational to determine the cause of the appearance of the phosphates in this manner by a subsequent examination of the blood, and in the paper to follow I am going to demonstrate that such destructive process within the leucocytes and the insufficiency of nuclein contained within their nuclear body can be demonstrated positively and finally by the various staining methods which I now employ.

The results of blood examinations have contradicted former prevailing ideas, that because of the existence of a pale face there is always an anemia present and that iron is always indicated; that a flushed face is not always a proof of an increase of hemoglobin in the blood; that the appearance of cardiac and pulmonary symptoms is not always an indication of organic disease, but is often a symptom of chlorosis.

The examination of the blood makes a positive diagnosis of malaria. It enables us to make a proper distinction between the diagnosis of leukemia and tuberculosis. It enables us, in conjunction with the Widal test, to make a positive diagnosis in typhoid fever, and last but not least, on account of the superior knowledge of the function and composition of the leucocytes, their histological differentiation and classification enables us to corroborate the fact that the old-time prevalent idea that a so-called leucocytosis was indicative of disease, is erroneous. One of the reasons why the progress in medicine has not been more extensive may be due to the fact that the universal custom of our medical colleges to accustom the student of medicine to the systematic teaching in the hands of one teacher is being adhered to. This process more or less involves the handing down from one generation to another of the ideas of one man to another, while the teaching by various professors educated at various medical institutions would implant upon the active brain of the young student various teachings which would cause him to exert his best endeavors to find the cause of differentiation and derive from such studies a new line of thought and a new path.

upon which he will enter upon experimentations which must necessarily result in advancing ideas and benefiting both the medical profession and humanity at large.

With these facts before us, it remains with us to strongly endorse post-graduate instruction. With the experience the young physician has gained since leaving his *Alma Mater*, he will be enabled to put the many methods acquired during this time to practical use.

The subject which I have selected for this paper is especially intended for the differentiation of leucocytosis.

Leucocytosis should be considered in three different classes: a physiological leucocytosis, a pathological leucocytosis and a leucocytosis depending upon medication. The former two are subdivided as follows:

A physiological leucocytosis is divided into three classes: (a) Digestive leucocytosis, (b) leucocytosis of pregnancy, (c) leucocytosis of the new-born.

A pathological leucocytosis is divided into four classes: (a) Leucocytosis due to inflammation, (b) leucocytosis due to malignant tumors, (c) a post-hemorrhagic leucocytosis, (d) a pre-mortal leucocytosis.

In order to do full justice to the subject, it is necessary to laud the work of Metchnikoff, who was the first to establish the fact that the leucocyte is the agent of nutrition. He established the fact that the leucocytes convert all proteids into nuclein, and that this nuclein represents all the nutritive material delivered to the several tissues of the body by the blood. Originally the term "nuclein" was applied to a peculiar phosphorous substance isolated from the nucleus of pus cells which apparently made up the greater portion of the nucleus. Chemical analysis revealed the fact that the amount of phosphorus contained in this product isolated from various sources varied to a great extent. This caused the suggestion that the processes of separation might have caused a certain amount of cleavage or decomposition of more complex molecules resident in the cell and of which the isolated nuclein was only part, and this we may presume to accept as a fact.

The employment of chemistry for the isolation of nuclein must cause a splitting of this organic product into by-products of nucleic acid and nucleo-histon. The separation of organic elements from their habitat by means of chemical processes is bound to cause a contraction when organic and inorganic elements meet.

A diagnosis based upon an examination of the blood taken from a patient upon inorganic medication is not absolutely reliable unless such diagnosis is based upon repeated chemical examinations of the blood.

Noting that profound pathological changes occur within the cellular elements of the blood prior, during and immediately after meals, it must appear at once as reasonable to advocate the usage of organic remedies at such a time as not to exert their influence upon

the blood cells while approaching such pathological changes. The diagnosis of disease depends not so much upon the estimation of hemoglobin and the counting or formation of the red cells, but rather upon the differentiation and classification of the white corpuscles. I assert this opinion upon the known fact that the leucocytes convert and distribute the proteids as tissue pabulum, it thus being demonstrated that the leucocytes are the main factors in hematology. I have made it my study by a series of experimentations to, if possible, determine their age and also determine the period of their best activity. In order to determine this fact it did not remain with pathology alone to arrive at a definite understanding, but the various staining processes and organic therapy had to be called into requisition.

As a preliminary to reciting the results of my investigations, it is necessary to recall the classification of the various leucocytoses which may confront us in the study of hematology as above cited. We can determine the exact cause or origin of the leucocytosis by means of staining processes which will present to us widely different histological pictures. At times we will be confronted with a true picture of leucocytosis which in reality is a leucocytodieresis or, in other words, a pathological process whereby the nucleus of the leucocytes is in process of division (karyokinesis), causing there the creation of a number of individual nuclei and nucleoli which rapidly surround themselves with a distinct blastema, thus causing the creation of young lymphocytes. This process of cellular metamorphosis is one of the processes due to the physiological action of some therapeutic agent and is a most desirable manifestation and indication towards a favorable prognosis. I intend to show by illustration that it is absolutely necessary for the hematologist to know the therapeutic agent employed in the case under observation, in order to absolutely and correctly make his diagnosis.

Regarding the various changes occurring within the leucocytes and various staining processes, we may have as an authority Arnold, who has observed the change of staining qualification of the plasma and nucleus after iron medication; with the methylene blue and eosin stain he obtained varying results. In some instances the cytoplasm appeared to have taken but a very weak stain, while at other times the stains were profound. He noted that the granulations in but very few instances allowed the recognition of iron, and, furthermore, that according to the various stains employed upon the same specimen, the leucocytes appeared less or more in quantity, less or more in size and less or more granulated.

This, coming from so high an authority as Arnold, necessarily leads us to recognize the fact that the diagnosis based upon a blood examination, without the additional knowledge of employed therapy, will prove erroneous; and it was this very fact that led me to enter upon the study of determining the number of stains and combination of stains and the morphology of the leucocytes.

Leucocytes are not all alike histologically, and their functions are as diverse as their morphology. Classification of the leucocytes depends upon the staining processes employed upon their microscopic structure and reaction.

The lymphocytes are small cells, resembling in size the red corpuscles of normal blood, whose centre is taken up by a large, round, homogeneous, stained, concentric-lying nucleus, surrounded by protoplasm. The nucleus and protoplasm are basophilic, but with some basic stains the protoplasm shows a greater affinity than the nucleus. Often from one to two are visible within the nucleus. The latter appears with a relatively-thick, deeply-stained membrane. The varying size of the lymphocytes as found in the blood of children and adults, or as in cases of lymphatic leukemia, has led to the wrong interpretation of these bodies. Thus Troje's marrow cells have absolutely nothing to do with bone marrow, but are large forms of lymphocytes. This latter view has been confirmed by Frankel. In normal blood of the adult the percentage of lymphocytes amongst the white cells is from 22 to 25 per cent. An increase above this is termed lymphocytosis or lymphemia.

*Large Mononuclear Leucocytes* are voluminous cells of about two to three times the size of the erythrocytes with a large oval eccentric-lying but weakly stainable nucleus and strong protoplasm. The latter is free from granulation, is weakly basophilic and in contrast with the protoplasm of the lymphocytes possesses less staining affinity than the nucleus. In the normal blood they appear in about 1 per cent. Their origin has not been established whether from the spleen or bone marrow, but all recent researches point to the latter as their source.

*The Transitional Forms* deviating from the large mononuclear leucocytes are differentiated from the latter by indentures of the nucleus and the greater staining affinities of the latter, and the appearance of a small number of neutrophilic granulation in the protoplasm. The number of mononuclear leucocytes and transitional forms in normal blood amount to about 3 to 4 per cent. of the white blood corpuscles.

*Polynuclear Leucocytes.* These originated to a small degree from the transitional forms in the blood circulation, and the rest are formed in the bone marrow. They are smaller than the mononuclear and transitional forms, and are recognized by the peculiar polymorphous nucleus. The total division of the nucleus into three or four round nuclei is a natural process. The nucleus shows an affinity to all nuclear stains and the protoplasm shows a strong affinity towards the larger number of acid stains and is characterized by a thick neutrophile granulation. The reaction of the protoplasm is alkaline, but in a less degree than is the case of the lymphocytes. The ordinary polynuclear cells contain free glycogen but in specific diseases we come across cells giving free iodine reaction. Glycogen has been demonstrated in the blood of diabetic patients and free iodine in the blood in cases of contusions and

fractures, pneumonia and narcoses of long duration. The number of polynuclear leucocytes in normal blood is 70 to 72 per cent. of the total white corpuscles.

*Eosinophiles* resemble the polynuclear neutrophiles, but are easily differentiated by the intensive granulations possessing a special affinity to acid stains. Their number is from 2 to 4 per cent.

*Giant Cells* (Mastzellen) are sparingly found in the blood to about 5 per cent. They are known by their intensive basophilic granulation of irregular size. The nucleus shows little staining affinity, and thus these cells often appear as light polynuclear non-granulated cells.

"*Pathological Blood.*"—Mononuclear cells with neutrophilic granulation (Myelocytes) are voluminous with a relatively large weakly stained nucleus, centrally located and evenly surrounded by protoplasm. A noted difference between these and the large mononuclear leucocytes is the noted decrease of neutrophilic granulations of the protoplasm, and aside from the large forms of myelocytes, smaller ones are frequently found of about the size of the erythrocytes. Transitional forms in a stage between the two previously mentioned ones are also found.

In contrast to the polynuclear neutrophilic cells, these myelocytes show no ameboid movement upon the hot stage apparatus. They are always found in myelogenous leukemia. They have also been found in lymphosarcoma accompanied with bone marrow metastasis, in post-hemorrhagic anemia and in cases of mercury poisoning. They are frequently found during children's diseases, especially in anemia pseudoleukemica infantum. Of especial interest is the appearance of myelocytes in infectious diseases, especially in diphtheria (Engel), 6 per cent., 4 per cent. (of the cells) indicating an unfavorable prognosis. At the beginning of pneumonia no myelocytes are found, but they are plentiful at the time of crisis, at times as high as 12 per cent. of all neutrophilic cells. Mononuclear eosinophilic cells (eosinophilic myelocytes) represent the eosinophilic analogue of the previous group and are mostly larger than the polynuclear eosinophiles. Smaller specimens are frequently found in leukemia. They are rarely found outside of myelogenous leukemia and anemia pseudoleukemica infantum, and, if so, only in infectious diseases.

*Small Neutrophile Pseudolymphocytes* are of about the size of the small lymphocytes. They have a round intensively-stained nucleus and a small strongly-neutrophilic granulated protoplasm. They are rarely found and are dividing products of the polynuclear cells. The latter process occurs within the blood where first the nucleus divides into four or five parts, after which the entire cell divides into equally as many fragments. These cells are found in fresh pleuritic exudates.

For the thorough understanding of blood histology it is of the greatest importance to thoroughly understand the origin of the



leucocytes, whether in the lymphatic glands, spleen or bone marrow. At one time there was a movement on foot to consider all leucocytes as derivatives from the lymphocytes. Similar opinions prevailed after the embryological works of Saxer, which were accepted by most anatomists, physiologists and clinicians. Gailard's anatomical works tended to demonstrate that all varieties of leucocytes were only different developing stages of one and the same element. He differentiated hyaline and asidophilic and basophilic cells, and deviated them all from the lymphocytes. In 1889 Uskoff reported a series of experimentations which showed him three developing stages in the cell form: First, young forms or lymphocytes; second, large cells (ripe) with a large and irregular nucleus representing mononuclear or transitional forms; and, third, old cells representing polynuclear cells. He obliterated the eosinophilic cells entirely. His experimentations were followed up by Frankel, who confirms the view that the lymphocytes represent the young cells of all leucocytes.

Before entering upon a description of the results obtained in the preparation of blood specimens by means of various single or combined stains, it is well to also mention the various basic and acid stains. Regarding the properties of stains, it is my view that the opinion of the laboratory worker, based upon actual facts, should supersede the opinion of the chemist. Amongst the acid stains used in my experimentations were fuchsin, orange, nigrosin, eosin, indulin and aurantia. The basic stains employed were methylene blue, safranine, theonin, gentian, violet, bismark brown, and methyl violet. The fact that the leucocytes are the carriers of nuclein to the various tissues of the body, made it appear reasonable to institute investigations as to which one of the stains would exhibit the closest affinity to nuclein. This necessitated the isolation of nuclein by means of chemical processes. A quantity of fresh-drawn blood was mixed with water and ether in equal parts, causing the nuclear element to aggregate in a layer between the ether and water. After slight trituration the fluid was drawn off by means of a pipette, and the residue was washed in water and finally boiled in alcohol, leaving a precipitate of a clear white color and flocculent white consistency. Chemical tests of this substance show the percentage of phosphorus to be 5 : 7. This product was mixed with a pepsin solution so as to reduce the probable albumen present, and the final product obtained by repeated washings responded to the formula of  $C_{29}, H_{49}, N_9, P_5, B_{32}$ . Aside from the nuclein thus obtained, further nuclein was obtained by digesting in a pepsin solution a quantity of the organic physiological product known as protonuclein. The residue left after digesting this product with pepsin resulted in obtaining a somewhat larger supply of nuclein. To 5 per cent. solutions of nuclein in water at a temperature of 98 degrees I added the various basic stains heretofore mentioned, and learned that the bismark brown stain showed more affinity to nuclein than the gentian violet and methylene blue

stains, and subsequently to the nucleus of the blood cell. With this information on hand I undertook to stain blood specimens, using bismark brown and methylene blue, also gentian violet as basic stains in combination with the various acid stains previously mentioned.

The microscopical pictures thus presented appeared uniform, and my investigations were furthered by using first as a basic stain methylene blue, and, after washing the specimen in water, continuing with an acid stain, again washing the specimen in water, and following this by using a second basic stain different from the one used at the beginning. The various specimens subjected to such treatment finally resulted in giving various microscopical pictures, especially showing the histology of the lymphocytes. The protoplasm appeared transparent on all specimens on which acid fuchsin and orange were used as acid stains, and wherever eosin was used there appeared a pale pink ring on the protoplasm. The employment of a single basic stain effected a stained periphery, while the employment of two basic stains and one acid stain in the manner previously mentioned showed not only the periphery, but also the nucleus in the protoplasm relatively distinct. A number of specimens stained by various methods showed the lymphocytes contained no granulations, while others stained by my method always revealed granulations. With these facts before us, it remains to be seen of what importance it is to the hematologist to have a perfect stain or staining method by means of which he is able to gain a true histological picture of the specimen under observation. I desire to mention that blood preparations prepared in the regular manner and dried in a hot oven at a temperature of 34 degrees centigrade, were of better value than those specimens which were heated on a hot plate, or which had been subjected to twenty-four hours' immersion in alcohol. The importance of the special stain occurred to me while experimenting with malarial blood according to the Ziemann Romanowsky method, the proper usage of which requires a great deal of study and experimentation, so as to obtain a proper stain. The method of preparing this stain is well illustrated in the work of Ziemann, entitled "Malarial and Other Blood Parasites." A comparison of malarial specimens stained either with eosin and methylene blue or the triacid stain of Ehrlich, or the Sudan stain, which is rapidly coming into prominence, with results obtained from the Ziemann Romanowsky stain, will at once exhibit the superiority of the specimens prepared by the latter method, by a more delicate outline of the structure, and the perfect stain of the malarial parasite and its spores. My experimentations regarding the study of the leucocytes by various staining methods resulted in producing for me the best results by employing the following staining method. Immerse the specimen in a 1 per cent. aqueous solution of methylene blue for one minute, wash the specimen in water, after which immerse in a 1 per cent. alcoholic solution of eosin for one minute; again wash the specimen in water

and immerse for one minute in a 1 per cent. aqueous solution of bismark brown. This same stain I employed for lymphocytes, myelocytes, eosinophiles, mononuclear leucocytes and polynuclear leucocytes with the best results. The basic stains appeared in bright colors, showing their extreme affinity in the nucleus of the polynuclear leucocytes. The illustrations presented show the peculiarities of the bismark brown stain, and according to previous chemical tests appear as a guide to estimate the amount of nuclein exhibited in each nucleus. My experimentations upon animals regarding the effect of nuclein feeding upon blood cells gave the following data. Both series of animals fed on carrots, cabbage, grain and bread gave the following results of blood examination: Hemoglobin 72 to 84 per cent., red cells 4,000,000 to 4,500,000, white cells 6,000 to 6,500. The animals were separated into classes A and B. Class A continued on previously mentioned diet, while Class B received five grains of protonuclein three times a day. After first twenty-four hours blood examination of Class A showed slight or no alteration. Employing above suggested staining methods we note the lymphocytes with a weakly stained periphery and fully stained nucleus. The eosinophiles show no trace of the bismark brown stain, the mononuclear leucocytes show weak brown granulations and the polynuclear leucocytes show deeply brown stained but sparing granulations. Examination of blood of animals of Class B reveals hemoglobin percentage unaltered, red cells slightly increased, white cells largely increased. The lymphocytes show a deep stained periphery (blue) and a fine granulation in brown evenly distributed. The eosinophiles, aside of their peculiar red granulation, show the nucleus to be covered with brown granulation. The mononuclear leucocytes exhibit a dense brown granulation, and the polynuclear leucocytes exhibit coarse almost separated brown granulations. The impossibility to observe the stained specimen on the hot stage prevented my proving my prevailing opinion that each one of the coarse granulations just referred to represents a distinct nucleus formed in the dividing process of the polynuclear nucleus prior to being liberated to become a lymphocyte. The possibility to observe the dividing process of the stained leucocyte upon the hot stage would have enabled me to explain the creation of a finely granulated nucleus of the lymphocyte from the coarsely granulated divided nucleus of the polynuclear leucocyte. We must hope that further investigations on this line will cause the solution of this problem. The lesson taught by these experiments teaches us the value of nuclein as a reconstructor, not alone of red, but also of the white blood cells. It teaches us that nuclein medication will cause an increase of active phagocytes, a manifestation very much desired in infectious diseases, and it furthermore demonstrates that the medical profession should encourage the work of those who devote their labor to research work, the combined efforts aiding towards lifting the departments of medicine and surgery to the highest possible plane.

PHYSICAL TRAINING—ITS RANGE OF USEFULNESS IN THERAPEUTICS.\*

BY B. E. MCKENZIE, B.A., M.D.,

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ANY subject chosen for presentation to a body such as this must, in its recital, justify the course taken; it would be presumptuous to take up your time in relating well-known and generally recognized facts. It is the privilege and duty of the specialist to act as a scout going in advance of the main body. Alone he may spy out the enemy's country along only a narrow tract, but there is the more reason why his scrutiny should be careful in order that he may bring reliable reports to the advancing army.

In the thirteen years just passed there have come under my notice a considerable variety of cases which the general practitioner finds it difficult to deal with satisfactorily, and which have been treated with gratifying results by means of physical training. In some of the cases I am of the opinion that there is little or no room for discussion; in others, no doubt, the paper will arouse opposition.

The tendency towards urban life, the pressure of school work, the conventionalities of dress, the customs of society and the keen competitions of life have brought about conditions presenting a marked contrast with the physical status that existed when a very much larger percentage of our population grew up in the country, accustomed to the active duties of the pioneer. The need of physical education, scientifically pursued, is greater now than it was then.

The term, physical training, as used in this paper, is meant to have a wide meaning, including, not only work in the gymnasium, but out-door sports and games conducted under supervision. Its purpose is to advocate scientific methods of development such as will bring all the physical powers to a higher standard of efficiency in order that the individual may be better equipped to bear the burdens and do the duties of life with ease and enjoyment; and, especially, to show its application in cases that have congenital or acquired defects.

There is a marked tendency everywhere to make the athlete a specialist, as much so as is the professor of Greek or Hebrew; such an extreme development along one line is not the best equipment for meeting and performing the duties of life. It is not the highest gain to be able to run a mile in the shortest time or to be able

\*Read at the Meeting of the Canadian Medical Association at Ottawa, September, 1900.

to stand the most abuse in the prize ring; but it is of vast importance that the growing child should be able so to breathe as to inspire sufficient oxygen to purify the blood and assist in the physiological processes that are essential to the highest development of both mind and body; it is essential that the powers of co-ordination should be at their best so that physical units may act in harmony; it is important that disabilities and defects, congenital or acquired, should be remedied or improved so that the individual may not be hampered or weighted down in life's contests.

Physical training may be considered as general and corrective. Reference here is made only to the latter. It is assumed that the person put in charge of the physical training work has a good understanding of physiology and anatomy and of the principles underlying successful gymnastic training. Those who come to us are patients, and our study and practice in this work is that of applied gymnastics and athletics.

#### DEVELOPMENT.

Development is the result of three factors—heredity, environment and activity of function. We pass by the first without further reference. The second we try to determine as correctly as possible during the time that the patient remains in our care; and this feature of the work is of the utmost importance. The third opens to our vision the whole subject of education.

Without activity within physiological limits no cell can have a normal development. In the cervical cord the motor cells are imperfectly developed if the arms have been amputated in early infancy. The speech centre itself is not always developed in the left cerebral hemisphere; but, in left-handed persons, in the right hemisphere (Owen). If the eyes be removed from a new-born animal, the optic nerves and tracts cease to develop, and they degenerate so that the corpora geniculata, corpora quadrigemina, and the pulvinar on each side manifest a similar degeneration (Fawcett).

The inference drawn from these physiological data is that in order that any structure, whether it be bone, muscle, viscus or nerve, shall attain its highest development, it must be so educated as to perform its own function up to the limit of physiological well-being.

The purpose for which physical training was commenced in the Orthopedic Gymnasium was comparatively narrow. For a long time those who had devoted special attention to treating cases of spinal deformity had found the results unsatisfactory. Dependence had been placed almost entirely upon braces. Little had been done on this continent before 1887 to make use of corrective gymnastics, with a view to supplanting mechanical treatment by rational developmental methods. The first efforts had in view the treatment of such cases as those of lateral curvature, round shoulders, etc. Incidentally there came under observation patients who



FIG. I.—L. R., 14 years of age. Figure at the right shows her standing naturally and without effort; figure at the left shows her best position, making an effort, after treatment for three months.



FIG. II.—L. R., girl 14 years of age, same as Fig. I. In this stooping position the rotation or twist in the spine is well shown in the figure at the left, that at the right shows that actual rectification took place even in the bony structures.

were suffering from other defects, such as flat-foot, pigeon-breast, parietic conditions, assymetry from any cause, and frequently cases that might be considered to be in the pre-tubercular stage.

By way of illustration I will here give a brief clinical description of one case which might fairly belong to the last class referred to.

#### PRE-TUBERCULAR STAGE.

E. M., a girl, aged 14, under treatment by Dr. L. L. Palmer, for nasal catarrh, referred to me because she had a slight lateral curvature. On examination the girl is found thin and pale, the infra-clavicular regions depressed, especially that of the right side, though examination revealed no actual deposit. This girl remained constantly in the gymnasium for nine months, and occasionally came for the work during the second year, with the result that she improved very greatly in general health, acquired a large amount of thoracic development and mobility, increased in flesh and color, and maintained an excellent figure. It would seem no unwarrantable claim that the improvement which occurred in the curvature of the spine (which was very satisfactory), was yet only a small part of the gain made. It is no uncommon observation that young girls can show a difference of three to four inches between forced expiration and forced inspiration, and a few months' training sometimes shows a gain of one to two inches in thoracic measurement.

Klebs asserts that in the great majority of cases, tubercular infection of the lungs occurs in the posterior part of the apex (this being the most vulnerable point), as a direct result of a discharge of infected chyle into the vena cava. If this part of the lung apex be healthy, so as not to present a suitable nidus for the germs, they may pass on with the current of blood to find lodgment in some other area; but if the blood has been thoroughly aerated it may exert its bacteriological power over them, and may remove the germ by the action of the phagocytes. In the case of persons who have but little reserve power, and whose ready vulnerability presents a temptation to invasion by the bacillus, there is probably no agency that will so completely raise the individual to a higher standard of physiological efficiency, enabling him to offer greater resistance than such thorough deep breathing of pure, sun-warmed air as will open up every ultimate lung-cell, thus affording the fullest opportunity for protection by Nature's own means.

Nothing that is here stated is intended to advocate forced lung exercise, when inflammatory conditions have arisen as the result of tubercular deposit. It is wise to bear in mind constantly the distinction between a simple lowering of the physiological power of resistance and the actual existence of disease.

#### TWO VARIETIES OF SPINAL CURVATURE.

It will be well to point out here also that in the common term spinal curvature there are two conditions existent which differ

radically, and require to be carefully distinguished. In the one there is tubercular disease present which has produced more or less destruction to the bony column, and is analogous to the early deposit of tubercle in the lungs, and requires to be guarded from increased action just as does the lung which has become inflamed. The other variety is not accompanied by any inflammatory condition nor destruction of tissue, but is dependent upon some cause or causes which produce simple deformity without disease. It is this latter variety that may be treated successfully by the means here advocated.

#### OBJECTIONS TO TREATMENT BY BRACES.

There are three strongly marked objections to be urged against any brace or jacket for the correction of lateral curvature of the spine.

The first is, that such mechanical appliances do not correct the deformity. In order that a brace may act efficiently it must be based upon the principle of the lever, and three points must be available for the application of the force—that for the weight, for the fulcrum, and for the power. Considering that the chief deformity in lateral curvature is, in nearly all cases, higher than the inferior angles of the scapulæ, and that patients will not tolerate a brace which will extend above the level of the shoulders, it becomes impossible to have three points at which to apply the force. Few who have made extensive trials in correcting spinal curvatures will claim to have had satisfactory success by the use of mechanical means. In my own observation I have not found one case in twenty on whom a brace can be wisely employed.

The second objection is this: The constant application of a force pressing upon the structures of the trunk produces atrophy and weakness of the muscles, and limits and discourages free thoracic movement. The air cells are not filled with the constantly changing air, the thoracic organs are hindered in their development, and the indications which exist for the treatment of persons thus affected are not met, but rather the reverse condition is brought about.

The third objection: It is natural to lean upon any artificial help to which one becomes accustomed. The individual learns to depend upon the brace, instead of cultivating his independent power of maintaining an attitude of erectness.

#### TWO VARIETIES OF LATERAL CURVATURE.

In dealing with lateral curvature it is well to distinguish between two classes of cases each of which presents its own distinctive clinical picture. The one is the patient who has had deformity from early life, and where the affection arose from lack of asymmetry in the skeleton, so that we have to deal with a case presenting actual bony deformity. The other is a case of postural deformity. This arises frequently from relaxed habits of stand-



ing and sitting, from the use of improperly constructed school furniture, etc.

#### POSTURAL CURVATURE.

In dealing, in the gymnasium, with the latter class, those who present simply a postural deformity, and who have little or no real asymmetry dependent upon skeletal deviations, free gymnastics are called for. The patients are ranged in a small class numbering not higher than ten or twelve upon the gymnasium floor, and are taught the correct method of standing, so that the attitudes shall be the best possible for the individual. This part of the work must largely be done with each patient alone, and a large mirror can be used with great advantage to help the patient to understand what it means to maintain an ideally erect attitude. Henceforth, throughout all the exercises, there is an effort made to have the patient return constantly to the ideal position just described.

#### FIXED CURVATURES.

In dealing with fixed curvatures something is required in addition to the training or educational method just referred to. The employment of force outside of the patient is necessary. With this object in view patients are allowed to swing freely, having the entire weight of the body suspended by straps passing underneath the chin and occiput. There are few persons who would be willing, at first, to have themselves thus suspended; but patients coming into the gymnasium, and seeing others swinging back and forth through an arc of twenty feet or more, soon realize that it causes no pain, but that it may be made a source of pleasure and amusement. The ceiling of the gymnasium is fifteen feet from the floor and we have an iron rod extending along the centre from end to end. Several ropes are suspended from this rod and brought down to varying heights, so that patients of different sizes may find a convenient point of suspension in such a way that the toes can barely be brought to the floor. Thus suspended six or eight patients at a time amuse themselves by swinging back and forth from one side of the gymnasium to the other. It will be seen that in this manner a considerable force is exerted to straighten the spine, the pull being felt especially upon the concave side and in the shortened ligaments of the vertebral column.

In the more strongly marked cases a still further application of force is made. While the patient is suspended a girth passes around the thorax similar to a saddle girth, and the patient is drawn away from the perpendicular line of suspension by passing a rope from the girth to a pulley placed on a higher level. The lateral pulling force is made in such a direction as to press the spine toward a straight position. Even a further force may be employed. It is well known that the rotation or torsion of the spine is the most difficult to correct. While the patient is suspended and the lateral force as above described is being exerted,

the arm of the director may be placed around the body so as to fix the pelvis, while the other hand is pressed forcibly upon the most prominent portion of the ribs. In this way a most direct power is employed for untwisting the distorted spine.

Dr. Lovett, in a paper recently published, has shown how the spinal column, when hyper-extended, tends to make correction of the rotation during lateral bending. This principle is employed by us in the application of the girth, so that there are two forces at work tending to correct the rotation which is the most difficult element to rectify. The one is found in the hyper-extension and lateral bending, and the other in the lateral pulling by the girth



FIG. III.—K. D., 24 years. Figure at left shows natural standing attitude at commencement of treatment; figure at the right shows attitude which she could assume after treatment for two months.

applying its force at the point of greatest prominence of the deformity.

These various agencies, which are employed for stretching and forcing the deformed spine into a corrected or over-corrected position, not only do not produce atrophy, but they actually cause increased growth by stimulating the circulation; and they become a method of giving massage to all the structures of the trunk. It is difficult, by any ordinary methods, to give massage effectively to the deeper tissues of the spine. By the method above outlined, however, even the ligaments, fasciæ, muscles and bones are so influenced that there is a stimulation of the circulation and consequently an increased growth.

Of all the methods which have been practised for employing force to rectify deformities of the spine, I know of none which it can be so effectively and powerfully accomplished, without the production of pain or without the danger of causing any harm, as by the simple methods above outlined.

#### IMPORTANCE OF DIAGNOSIS.

A word of caution may not be out of place here. Occasionally we find patients, sent in with a recommendation to treat them in the gymnasium, who, upon careful examination, prove to be the subjects of organic disease of the spine. I have already pointed out that such active and forcible treatment would be entirely contraindicated in such cases.

It may be said that such employment of force can be continued for only a comparatively short time. Correction of the deformity, however, though it be only for an instant, implies that all the structures upon the concave side have been stretched sufficiently to permit of correction.

#### THE EDUCATIONAL ELEMENT.

At this point the element of training or education is called into play. After employing force as described, the patients are ranged upon the floor in small classes and each is taught to maintain the best attitude possible for that individual. In all work done as free gymnasium work, the patient is expected to return to this ideal attitude after every movement, with chest well thrown forward, shoulders held well down and backward and head erect. After every series of movements requiring muscular effort an opportunity is afforded for deep breathing. The utmost care is taken that in inspiration the lungs be filled to their utmost capacity, and that the patient shall learn to employ every lung cell so far as this is possible. Great stress is laid upon this point, not only to effect more complete aeration of the blood and to cause increased functioning of lung cells, but also for a reason which is more mechanical in itself, namely, that roundness and symmetry of the thoracic walls may be secured. In many of the deformities of the chest, such as pigeon-breast, it is not wise to apply any pressure from without to correct the deformity; and the only available means is that which is employed from within by the filling of the lungs to their utmost.

#### FLAT FOOT.

At an early period in this work it became manifest that weakness of the feet and of the leg muscles, producing what is commonly spoken of as flat foot, weak foot, weak ankles, could be most successfully and scientifically treated by methods which would increase the power of the groups of muscles holding the feet in a correct position. Even the normal foot when the individual

stands at rest has a tendency to turn over in such a manner as to allow the inner malleolus to come nearer the ground, thus producing pronation of the foot. In persons who stand much and have a predisposition to flat foot, the inner groups of muscles comprising the tibiales and the long flexors have become taxed beyond the limit of their reserve power and the foot gives way to the strain upon the ligaments, and the disabilities and pains of the flat foot are experienced.

Special boots, flat foot plates, and other mechanical devices are certainly of great importance in rectifying the deformity and lessening the pains of flat foot, but especially in children and adolescents the best results and the most scientific treatment is found in strengthening the group of muscles which hold up the arch and the inner border of the foot. The benefits to be derived, however, from training, are not limited to increasing the power of the structures at the inner side. Great gain ensues from educating the patient to hold the foot in walking and standing in such a position that the weight-bearing portions which come into contact with the ground shall be more directly under the body. In numerous cases of children and youth a lengthened period of education in this way has quite cured the deformity and has enabled the patient to hold the foot in good position without the use of any mechanical assistance.

In the treatment of flat foot I would name the therapeutic agents in order of importance, thus: 1, physical training; 2, properly constructed boots; 3, flat foot plates or other mechanical means; 4, operative measures in extreme cases.

#### CHOREA.

A few words concerning the treatment of chorea. My first experience in treating this disorder in the gymnasium occurred in the following manner. I was consulted in the autumn of 1892 regarding a boy of eight years who had lateral curvature of the spine. He was advised to come for treatment in the gymnasium but did not present himself for nearly three months afterward, and in the meantime had developed chorea. Believing the proposed treatment for the curvature in no way contraindicated he was placed in a class doing light work, mostly free gymnastics, none but himself having chorea. In all class work implicit, prompt obedience to the word of command given by the directress is insisted upon; but, at first obedience was, for this boy, impossible; he could not make the required movements. No special attention was paid to this fact and he was permitted to do the best he could and was so placed in the class that he could see and imitate others in front of him. After the first lesson it was quite evident that the inco-ordination was less marked and that he was gaining control of his unruly members. In less than a week—exercises were carried on every day—every sign of chorea had disappeared;

and so long as he remained under observation there was no relapse. In this case no other treatment was employed.

Since that time several other cases have incidentally come under our observation only two of which, however, have been such as to permit of satisfactory observation so as to note final results. Both of these were girls of about thirteen years of age, who had been afflicted for periods of one and a half and two years respectively. In both of these cases results have been most gratifying. The cure of the disease was not accomplished nearly so quickly as in the boy, but from the first, manifest improvement occurred not only in the control of the muscles which was acquired, but in the improved color and general condition of health. Each of these remained under treatment several months, and at the present time one of them presents no trace of the disease while the other manifests a slight uneasy and anomalous motion of the feet.

But few references are made in literature, so far as I can determine, to the treatment of this affection in the way here advocated. The most extended reference to the subject that I find is that by Le Grange in his work, entitled "La Medication par l'Exercices," 1894, p. 425. He says: "It is in affections marked by defective co-ordination of movement that exercise has given its best results, and especially in chorea or danse de Saint Guy. . . . In simple chorea, when the child has a measure of control over its movements, simple floor exercises, rhythmical and executed to the word of command, afford the nerve centres a form of discipline to which the child's members yield obedience, and the will gradually resumes control over the muscles."

Reference to the subject has been made by Wirt, of Cleveland, and by Somerville, in the *Scottish Medical Journal*.

Although nearly all of our ordinary books say that rest and medication are the only means of successfully coping with this disease, yet it seems to me that physical education is a very rational method, especially when the acute stage has passed and the disease has become chronic.

#### HYSTERIA.

One of the most interesting series of observations that we have been able to make in this work has reference to hysteria. In dealing with this affection of protean form one fact has impressed itself upon me more than any other, the necessity of obtaining absolute control and of exercising wise discipline in the case of patients thus affected.

L. D., aged 22, referred by Dr. Reynolds, of Mount Forest; farmer's daughter; said that she had been unable to work for six years; that she had suffered with pain in the back and head and inability to exert herself; for three months previous to consulting me she had been confined to bed unable to help herself; her mother had been an invalid for ten years and is said to be suffering from spinal disease. This young woman was brought to my office on a

stretcher, and upon requesting her to stand up and disrobe that I might examine her spine, her aunt said she was unable to stand or even to hold up her head. By insisting upon her doing as I requested, she did stand up and was examined; but I was unable to find any evidence of organic disease. Within a half hour she walked up two flights of stairs to the ward in the hospital. At once she was taken into the gymnasium for an hour each day, and work, at first light but increasingly difficult, was given until she was able with the other patients to do all the ordinary work. Treatment was continued for a period of six weeks, at which time she

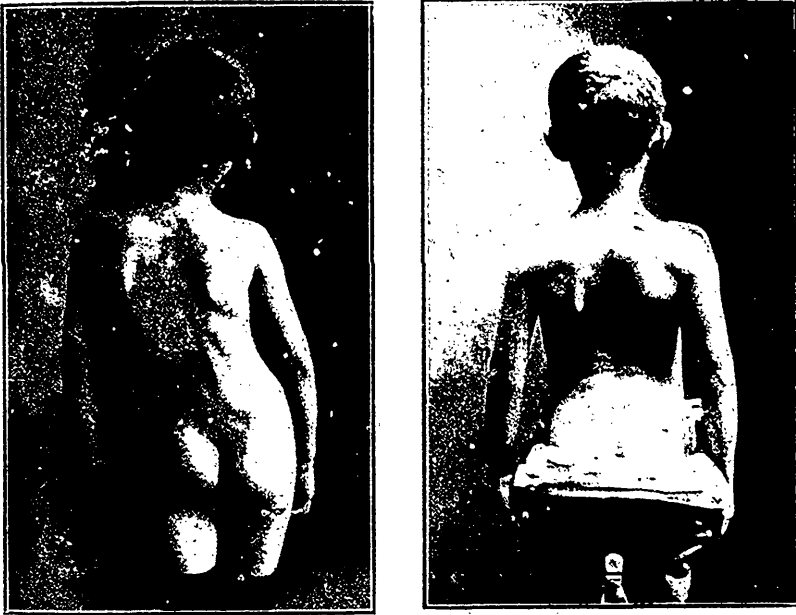


FIG. IV.—F. T., 5 years old. Paralysis of body muscles from anterior poliomyelitis which causes the deformity. Received treatment at first by recumbency, and for a short time afterwards in the gymnasium. The figure at the right, however, shows the boy's condition two years afterwards, and illustrates well the natural tendency toward recovery in cases of infantile paralysis.

was spoken to very plainly regarding her condition and tendencies. She returned home and has now for a period of nearly a year continued well and is working hard.

E. G., referred by Dr. Coventry, of Windsor; a young woman aged 18; rather anemic and of nervous manner. At fourteen years of age she complained much of headache and backache and of general lassitude, so that she was kept from school most of the time. During four years which have elapsed both she and her family have considered her unable to work, and during this time she consulted a gynecologist, who removed one ovary; an orthopedic surgeon,

because she was lame and believed to present symptoms of hip disease, who assured the family that she had no joint affection; and a neurologist, who said he believed her condition was one of hysteria.

At the time of examination, in April last, I found her very lame, walking with a limp that was very different from any that I had ever observed. Although she was very lame, and had been so for some years, yet there was no evidence of any inflammatory condition of any joint and but very trifling atrophy of the limb. Whenever any part of the leg or foot was touched the entire limb was thrown into violent and erratic convulsions (I do not know what better term to use, so irregular and so extreme were the excursions of the limb). The heart presented a systolic-murmur; otherwise there was no evidence of organic disease. I expressed the opinion that the case was one of hysteria and advised that the girl come into the Orthopedic Hospital in order that she might be completely under control. Having carefully instructed the directress that all work given to this patient in the gymnasium must be done with the greatest care, beginning with the simplest forms of movement, gradually calling into exercise the individual extremities and seeing that excuses were not accepted in place of work, she commenced training at the beginning of June and continued until the 30th. While under observation during this time the only real cause for lameness that I discerned was an undue pronation of the foot, which I am disposed to think arose from her manner of walking for so long a time. At the end of the month the limp had almost entirely disappeared, her health and color had greatly improved and she had been taught to place the unduly pronated foot and to walk with it in a correct position. The highly satisfactory gain continues until the present. She has continued to improve during the two months of vacation.

M. D., aged 29, who, three years ago had a carbuncle situated near the coccyx, referred by Dr. Meade-Sirrs. In giving her history she speaks of "abscess of the spine," and says that some bone came away after incision. The cicatrix presented does not indicate that there had been anything more than a small carbuncle. During three years, however, she has worn jackets and braces, has been advised change of residence for her health, etc. Her invalidism continued up to the time when I saw her in May last. She then complained greatly of pain in the spine, and said that she was unable to work. Careful examination revealed no sufficient cause for the complaint made. All the organs were found in a healthy condition, her color was good, she had but little fat and her muscle was slight. She was immediately subjected to the usual discipline of the gymnasium with results as gratifying as in the former cases.

Let the brief recital of these three cases suffice to show the purpose of the work in the case of patients thus affected. It is not claimed that the special work done has any specific influence. I desire to emphasize here two features of the work. First, the directress who is in charge is a woman of good judgment, of tact

and firmness, and follows out strictly the directions which are given. Taking these patients into the hospital whenever this course is found practicable we obtain control of their lives, and do not allow a trifling matter to stand in the way of carrying out whatever regulations are deemed important. We obtain a very absolute control over the doings of these patients for a considerable length of time, and thus help them to act with good common-sense until they have been enabled to see the folly of their former course, and become inspired with confidence that they can conduct themselves in a rational manner.

DR. WEIR-MITCHELL'S TREATMENT.

Up to this point the treatment differs little from that advocated by Dr. Weir-Mitchell. The "rest cure," however, falls short,



FIG. V.—F. S., 29 years. Shows improvement in attitude which could be effected in two months' training.

inasmuch as it is too negative in character. Systematic training to self-reliance and renewed confidence are needed to render the cure effective. Though the patient should regain health it is soon found that life is not a negation, but that its problems must be grappled with in a positive manner and solved. Massage, good diet, etc., are important, but in order to establish permanent results the volition must be called into exercise.

The training continued regularly every day affords us an opportunity to exercise the necessary discipline, to bring into exercise and co-ordination the faculties and powers tending to produce rational behavior in a healthy individual. It is highly important, in the first place, to make a correct diagnosis, and, afterward in following out the work, it is essential that the person in



charge of the gymnasium shall proceed with tact and firmness. In the case of one young woman who was subject to "spasms" and great nervousness, when displeased or crossed, these attacks came on while at work in the gymnasium, and she had me sent for. I did not go to see her, although in the building at the time, but sent word that she must do her work as usual, and that no attention must be paid to her attacks. After this course had been pursued for some days these attacks disappeared, and she improved rapidly.

#### WEAK-MINDED AND BACKWARD CHILDREN.

Another class of patients who can be greatly benefited is the weak-minded. It has been a matter of surprise to know how many children who were brought for advice, because at two, three or four years of age they could not walk, are found to be of varying degrees of idiocy. The large number whom we have been called upon to advise in recent years greatly aroused my interest in and sympathy for them, so that when a proposal was made to found a school for the education of these unfortunates in Toronto I did what I could to encourage it. In this way arrangements were made so that the pupils of the school should have an hour and a half in the gymnasium each day for five days in the week. As this work continued only a few months I am not able to judge from personal observation regarding results, but the works of Shuttleworth, Ireland and others in the Old Land, and of Seguin and Hamilton Wey in America are well known. "Physiological education of the senses must precede the psychological education of the mind."—Seguin, "New Facts," etc., p. 41, 1870. "The training of the muscular system to ready and regulated response is merely an extension of the *serial training*, and both these processes only precede and prepare the way for more purely intellectual training." "Education (for the feeble-minded) then starts on physiological lines, and is addressing itself to the culture of the external senses, and then to the co-ordination of muscular movement, and finally to the promotion, by imitative and other exercises, both of the manual and mental activities."—Shuttleworth, "Mentally Deficient Children," second edition, 1900.

Even after a few months of training I have seen marked advance in the ability to fix the attention, to walk with improved bearing and better co-ordination for the performance of various simple athletic feats.

#### PARESIS.

Some rather striking results have been noted in paretic conditions. S. C., twelve years of age had hemiplegia when two years of age. Though she had learned to walk, the right arm had remained without training and was never used by the girl. She remained with us six months and received daily training in the use of the right hand and arm. At the end of that time she could handle fairly well the stirrup in drawing the pulley weights; she could

lift various objects and carry them across the gymnasium; could pick up and carry a chair with that hand, and had an increase of sensation. The treatment given during this time for the hand and arm consisted in daily massage and education in the way of voluntary use.

In cases of anterior poliomyelitis, where the group of cells in the anterior columns of the cord have been considerably disabled but yet control a considerable number of fibres going to the muscles of the extremity, much may be done to increase the efficiency of muscular power by calling into action the volitional ability that still remains to determine the action of these muscles.

#### OUT-DOOR WORK.

In all suitable weather patients are taken out after gymnasium work and encouraged to engage in games on an adjoining lawn under supervision of the directress. The element of play is introduced even in the gymnasium as much as possible. In this manner monotony is avoided, and in practice we find it very unusual for any patient to express dislike for the work; in fact, parents tell us that the children look forward with pleasure to their hour spent in the gymnasium or on the lawn.

#### IMPORTANCE OF CLASS-WORK.

Reference has been made to class-work. Upon this I desire to lay emphasis. Some who advocate the treatment of deformities by special exercises deal with the patients singly and not in classes. Much individual work must be done, but by neglecting class-work some of the best elements of power are lost sight of. The tactful teacher will hold up before her pupils a lofty ideal, and will call forth a spirit of emulation to stimulate the efforts of each. Then there is the example and sympathy of those who are engaged in the same work and contending with the same difficulties. A class *esprit de corps* is soon established which greatly lightens the labor; and an opportunity is afforded to introduce games, thus relieving the tedium of the work, which being repeated every day, is liable to become irksome.

#### CO-OPERATION ESSENTIAL.

In every instance it is essential to success that the hearty co-operation of the patient be secured. A series of meaningless (to the patient) exercises prescribed on paper to be executed at home or elsewhere is as dead and useless as would be the prescribing of so much Hebrew Grammar. There must be an intelligent, educated, sympathetic instructor and leader, a personality who can inspire confidence and command respect.

Work done in a perfunctory manner is worse than useless. A lofty ideal of what is possible of attainment must be created; and

the greatest good for the patient is secured only when the most ardent efforts are put forth to reach the most difficult heights of the ideal.

#### SUMMARY.

To summarize briefly :

1. Special physical training is rendered necessary for the young by the conditions of modern life.

2. The work is made special and scientific having for its object the development and strengthening of every organ and faculty of the patient.

3. As we conduct this work it is mainly educative. Force from without the patient, however, is largely employed in such cases as cannot of their own volition correct the deformity.

To name affections benefited in the order in which good results have been observed I would place them thus: Hysteria, rotolateral curvature, flat foot, round shoulders, pigeon-breast, flat chest, anemia, parietic weakness, chorea, imbecility.

In this list I have placed hysteria first, because I have not known any method by which this condition, generally so unsatisfactory to deal with, has been brought so successfully under control.

## THE PHYSICIAN'S VASTER EMPIRE.

BY JOHN HUNTER, M.D., TORONTO.

THE most casual survey of the medical literature of this, the last quarter of the rapidly closing nineteenth century, shows us along nearly every line in scientific medical research a progress that very justly may be called marvellous.

A few weeks ago the bells rang out at midnight the glorious news of a great military victory, and over which we entered zealously into the wildest acclamations of joyous frenzy as it presaged the establishment of civil and religious liberty throughout every portion of our world-wide empire. No array of statistics can sum up the value of the martial victories that have been won, yet these do not exceed in importance, nor do they surpass in beneficent influences the unostentatious work being accomplished by medical science. In the South African war the skill of the surgeons, the untiring devotion of the nurses and the intrepid courage of the ambulance corps, stand side by side with the most brilliant military tactics, and with the dauntless heroism of both the imperial and colonial troops. But far removed from trumpet blast or the fiendish roar of shot and shell, wherever our civilization has spread—from the imposing mansion of the great metropolis to the primitive wigwam in the primeval forest—the pangs of suffering are being assuaged and innumerable lives restored to health and usefulness through the practical application of the knowledge that our profession has acquired during the past five and twenty years.

It is not the purport of this paper to make, nor would its limitations permit of any lengthened review of the more recent achievements in medical science. We can—in geographical parlance—only glance at the countries more or less under our sceptre, as we travel on into the great continents yet unreclaimed. A visit to one of our hospitals furnishes abundance of indisputable evidence of what has been accomplished by the introduction of aseptic and antiseptic methods. Diseases once the *bete noir* of hospital practice are now effectually barred out.

The sleuth-hound, erysipelas, and the heterogeneous brood gathered together under the title of blood-poisons that shadowed the surgeon's knife so persistently only three or four short decades ago, have been banished from the operating-room. Portions of the body that were once most religiously pre-empted from the touch of the surgeon are now voluntarily laid bare on his altar.

If we direct our steps towards the medical wards we find scientific research—giving to this term its full significance, for I hold that the correct interpretation of clinical evidence, *e.g.*, discerning the true significance of pulmonary or cardiac sounds, is as

truly scientific as the determination of a specific germ by the aid of the microscope—advancing *pari passu* with that in the surgical ones. The study of the etiology of disease and of its pathological manifestations are being intelligently and most assiduously prosecuted. No longer is the physician willing to have his mind enshrouded in mere empirical fads. Nothing satisfies him short of actual facts. He only tolerates empiricism until the truth can be discovered. The precision so eagerly sought after in etiology and pathology finds an equally earnest counterpart in therapeutics. Drugs and remedies are valued just in proportion to their specific action. The old "shot-gun" prescription, like the old shot-gun itself, is now rather an object of curiosity than of utility. We see this desire for specific treatment fully manifested in the intense interest taken in serum therapy with its antitoxins.

Obstetric practice, too, has been revolutionized by the advent of aseptic and antiseptic procedures. The young wife can now lie down on the puerperal couch with as little forebodings of evil as when she approached the marriage altar. Asepsis has purified what love has sanctified.

However, in our art, as in mountain climbing, the ascent of each higher peak unfolds a wider vision. No sooner have we learned how to take care of the individual than we are confronted with the problems involving the well-being of the community and nation in which we may be more or less potent factors—and of the world in which, at least, as individuals, we can scarcely hope to be more than infinitesimally small fractions. The latter statement, though true, need not discourage us for we must not be unmindful of the inspiration instilled into our youthful minds by our teachers as they taught us to repeat that modest poem about the little drops of water and the little grains of sand.

Our special training enables us, in looking out on the wider field included in the well-being of the community, of the nation, and of the world, to form some estimate of the nature and amount of work yet to be done. Reference has already been made to some of the more brilliant achievements of our art, but these are not the roseate hues—the reflected light of a setting sun, they are but the scintillating rays of the dawn presaging the effulgence of the noon-day sun, when scientific medicine shall have spread her beneficent sway over the whole world. To help on this forward movement I think, Mr. President, that this Association might profitably take a suggestion from recent military tactics and make a reconnoissance in force of some of the great problems confronting us.

The remainder of this brief paper will be devoted to introducing three or four important questions well worthy of greater attention than they have had or are now receiving. These are: 1. Sanitary Science; 2. Education; 3. Social Purity; 4. Medical Missionary Work.

In regard to sanitary science or the laws and regulations per-

taining to health, our profession, through its members who compose the numerous provincial and local Boards of Health and who occupy the position of Health Officers, is exercising a potent influence. However much has been accomplished already, in preventing the spread of contagious and infectious diseases, yet we realize only too well how much remains to be done. Take, for example, the one disease, tuberculosis. Are not its ravages still appalling? Political scientists tell us that if our civilization is to be perpetuated the care and uplifting of the inferior races must be taken up as the white man's burden. Is it not almost equally true that the preservation of our race from destruction by tuberculosis is the physician's great burden? Look at the enormous amount of literature that is appearing on this question, and at the efforts that are being made everywhere to educate the masses, as to prophylaxis, and in regard to making suitable provision for the care of the "consumptive poor." But the conflict only seems to deepen. The most optimistic of us scans the horizon in vain for a specific. The contingents that have been sent out in the way of tuberculin, creasote, etc., have failed in altogether too many cases to rescue those who have been assailed by the bacilli. However, as loyal soldiers, we are not going to lay down our arms, we are going to fight to a finish. What does this mean? It means that it is the imperative duty of every physician to re-study the question of tuberculosis, to prosecute his researches into the etiology of every case so as to trace the origin of infection to its source, in order, when possible, to have it destroyed and to perfect his resources in detecting the earliest manifestations of the disease and to educate the people up to a proper recognition of the contagious character of tuberculosis, and of their duty to use such means as will prevent its spread. It involves also the education of the public to realize the importance of cleanliness, of having abundance of pure air and sunshine, of the use of plenty of wholesome, nutritious food, and of temperate and proper habits in every relationship in life, in maintaining health and preventing disease. It calls for the judicious expenditure of large sums of money in the construction and maintenance of a sufficient number of sanatoria where tuberculous patients can be properly treated, and upon physicians to settle the vexed question as to amount of isolation to be imposed on consumptives.

Another great problem in sanitary science, the solution of which demands of us at least intelligent co-operation, is the lighting, ventilation, heating and space capacity of private and public buildings. Is it not a notorious fact that one or more of these is grossly defective? It seems we cannot leave these matters altogether to the architect. We must come to his assistance. Of course, it can very truly be said that physicians have not the time to devote much attention to this department of sanitary science, but why should not some of our members become specialists in this line? There is a splendid field here for medical pioneers to

cultivate. The construction of our homes, schools, colleges, halls, churches, cars and boats should be under intelligent medical supervision, and *en passant* have not the wars in South Africa and China vividly impressed upon medical men the world over the necessity for efficient and ample provision being made for the care of sick and wounded soldiers? I need not enlarge on this phase of the question as some of the military surgeons present will do it full justice.

The second important problem that we have selected for consideration is our educational system. This question, Mr. President, should elicit an intensely interesting and instructive discussion, as there are so many professors, teachers, ex-teachers and High and Public School trustees amongst our members. Anticipating such a discussion, I will be very brief. We are not called upon, at least in our capacity as physicians, to decide what particular branches shall be taught, *e.g.*, whether we shall have more English than classics, or more mathematics than literature, but the methods in which instruction shall be imparted, the amount of time devoted to study, the age at which children should be admitted, the conditions on which they should be promoted from class to class, the hours of study, the amount of school and home work—these all call for medical supervision. How to have a child acquire a good education and at the same time acquire a high or even a normal standard of physical development is a very important problem. Under present conditions we know only too well that the close of the session generally brings an influx of patients, the victims of neurasthenia, anemia, insomnia, or of visual, nutritive, cardiac or menstrual disturbance. These morbid conditions, occurring session after session during a period of years, are a serious menace to both health and development. I think, too, that I am but expressing the opinion very generally held by the members of this Association when I say that the development and health of our young women call for some pretty radical changes in the educational systems in vogue in our collegiate institutes, universities and ladies' colleges. Now that we realize, probably more fully than ever before, that our civilization can only be maintained by a virile people, can we afford to submit those, whom we hope to see capable of rearing vigorous men, to debilitating influences during the most important period of their physical development? And not only from a military point of view, important as it is to be a strong military nation, but in every other sphere in life—labor, business or profession—physical development, vim and power of endurance are very powerful factors. It is unnecessary before such an audience as this to call attention to the exceedingly close relationship between physical vigor and high mental and moral attainments. A volume might be written on this question, but has not enough been said to warrant the statement that the time has fully come for physicians to make a forward movement and adopt a far more aggressive policy in inaugurating educational reforms that will not only permit, but

materially assist, our children and youth of both sexes, whilst acquiring a high standard of mental and moral culture, to develop such physical stamina as will enable them to meet all the duties of life, enjoying its sunshine and bidding defiance to its shadows for the allotted span of threescore years and ten, or perchance fourscore years?

The third great problem of our list is the question of social purity. In the momentous issues involved in the ethical aspect of this question this is neither the time nor place to engage, but I do believe that physicians, fortified as they are with their special knowledge, should speak, *ex cathedra*, against every form of sexual vice and immorality, with their disastrous effects upon the health and well-being of the individual, the community and the nation. On the threshold we, as physicians, are confronted with the question as to the amount and character of the knowledge, *re* the sexual system, that parents or teachers should impart to children before the age of puberty. There are those who claim that up to this age the great principles of right and wrong, implying thoughts, words and actions, should be inculcated through precepts and example, without any reference whatever to the sexual instincts and functions. Others, again, believe that, however desirable it would be to have our children grow up in an atmosphere of purity and in blissful ignorance of sexual distinctions, society is so constituted that our children cannot always choose their companions, the scenes they must witness, the knowledge they must acquire, the language they hear, or the character of books coming into their hands, and therefore some specific knowledge should be imparted as an antidote. For who of us cannot recall from even early childhood the unchaste picture, the impure words, and the immoral suggestions, jokes and stories, not only of older playmates, but alas! only too often, of both adult and aged men. The latter class also claim, and we as physicians can corroborate the truth of it, that whatever knowledge children receive about the sexual functions from ignorant and vicious sources is exceedingly detrimental to both their moral and physical well-being. For these reasons it is claimed that, however difficult and delicate the task may be, children should be taught at the earliest age possible such true facts pertaining to the functions of the sexual system as will prevent them from being deceived by the false and vicious teaching of the streets. No contagion is more dangerous than the contagion of impurity, and parents should be educated to appreciate the valuable services the family physician can render in helping them to preserve the morals of their children. They could well afford to pay for such assistance. Whatever differences of opinion may justly be held in regard to the methods of dealing with this question before puberty, there can be no objection to imparting the physiological facts pertaining to the sexual functions after this age. Boys should be frankly told the cause of emissions, warned of the degrading and debilitating effects of masturbation, and of the dangerous con-



sequences following infection from the venereal diseases. Is it not a lamentable fact, and cannot some portion of the blame be laid at our door, that the vast majority of our youth of both sexes fall into immoral practices or acquire venereal diseases through ignorance? However, with this great problem, your patience and my space only permit me to add a suggestion or two. Can we not utilize our knowledge as a cordon around virtue, to ward off the assaults of those vices and diseases that degrade and destroy our race? Can we not take more aggressive action in inaugurating reforms that will help to lessen the amount and mitigate the horrible consequences of the social evil? And have not the time and need come for us to assist our legislators in framing some prohibitory measures regarding the marriage of diseased persons?

The fourth and last question to be considered is medical missions. The purely religious phase of missionary work, however important it is, does not come under consideration. The aspects of the question it is our province to discuss, pertain to the unsanitary conditions of life in heathen countries, the absence of medical science and skill, the etiology, pathology and treatment of those diseases that cause such indescribable misery and suffering, or destruction of life amongst these people. Such now is the phenomenal expanse of commerce, that our mercantile fleets bring us in contact with everything from everywhere. We can no longer fold our arms and say it doesn't concern us, for the plague is away in India. To-morrow the virus may be transported to our own tables. We must study the history and character of these plagues that decimate whole races of the human family, for it is only by the aid of knowledge and "eternal vigilance" that infection can be kept out of our own harbors.

The "teeming population" of these heathen countries offers unlimited scope for clinical and scientific work. Hitherto these etiological, pathological, bacteriological and clinical mines, the proper working of which could have so vastly enriched the science and art of medicine and surgery, have been allowed to lie almost dormant.

Again—are we, who are so highly favored, to turn a deaf ear to the cry of the "submerged races"? Our country justly boasts of having sons who were ready to lay down their lives—aye, and did it, too—for their country's flag, but where are our legions of young doctors willing to go out and, if need be, lay down their lives in giving to the heathen those blessings our service can bestow, and in enriching our medical literature out of the knowledge and experience they would there acquire? Can we not appeal to the ambition—yes, and to the high sense of duty, too—of our young graduates and undergraduates, to emulate our gallant soldiers? No words can adequately express our admiration for what our soldiers have done, but may we not hope to see another equally noble contingent go out from our shores, not with banners flying and martial music mingled with the rumbling of wheels

bearing heavy guns; not impatient to be borne over a vast ocean and to spring on those distant shores, to assert their power with whiz of bullet, glitter of cold steel or hellish roar of shot and shell. No; the second contingent goes out noiselessly, with intellect and soul inspired from the treasure-house of science, with skilled hands unostentatiously bearing the implements of our art. They, too, long to reach those distant shores—not to slay, but to save; not to disable, but to restore to health and strength again; not to carry away captive, but to release the suffering from the bondage of pain and disability; not to establish civil and religious liberty only within the confines of an empire, but to place within the reach of every human being, irrespective of color, race, creed or nationality, whatever aid medical science and art can render, in bestowing health, happiness and length of days.

In conclusion, time and space alike have compelled me to condense into sentences what might justly claim volumes, but no paper is written in vain if it only suggests to other minds a train of thought along some important line.

Judging far more from what you know than from anything I have said, are we not justified in holding that the great fields of sanitary science, education, social purity and medical missions yet contain vast regions that we have scarcely explored, much less brought under the beneficent sway of medical science? Have we not by isolated action, such as an occasional lecture or article on some of these subjects, confined ourselves too long to merely "sniping" at the abuses that are rampant? Has not the time come when all the members of our profession should arm themselves with the facts that medical science can furnish, waging an uncompromising war against all that retards the development of mankind? thus going forth as the mounted infantry of science, to overcome and destroy the influences of the visible and invisible agencies of disease, to preserve the health and well-being of the race and to extend the sovereignty of medical science over "a vaster empire than has been."

## INTUSSUSCEPTION IN CHILDREN, WITH ILLUSTRATIVE CASES.\*

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INTUSSUSCEPTION constitutes the most frequent single cause of intestinal obstruction. One-third of all cases of intestinal obstruction, it has been said, is due to this cause. One portion of bowel becomes invaginated into another, and the invaginated portion (intussusceptum) becomes grasped by the outer layer (intussuscipiens) and is carried onwards by peristaltic action of this investing sheath, in the same manner as a particle of food would be passed on. Thus the condition may increase to a very extensive degree until many feet of bowel become involved. A predisposition to this would, no doubt, be engendered by an irregularity in the wall of the bowel; thus in the adult the advancing portion of the intussusceptum is occasionally a new growth, *e.g.*, epithelioma of the bowel wall; this is grasped and passed on by peristaltic action, drawing in the bowel after it so as to bring about the invagination. One layer may alone be invaginated in the intussusception, but occasionally it happens that two or even three invaginations may occur, one within the other, thus constituting several layers of bowel at the seat of the trouble.

The cause of intussusception in most cases is not observable. It is supposed that in consequence of some local irritation there starts up a peristaltic action of the bowel, limited to a certain portion of the gut, and that, as a result, invagination of the passive intestine in the neighborhood occurs. The occurrence of intussusception in the dying is a remarkable fact; one frequently finds portions of small intestine thus invaginated in infants *post mortem*. These intussusceptions are often multiple. Greig Smith believes that intussusception may be found in 1 in 4 of all *post-mortems*, if carefully looked for.

The symptoms of intussusception are often very characteristic, making the diagnosis easy, but occasionally they are very obscure. Pain is a constant symptom, and is of a characteristic, spasmodic type. It comes in waves; the pain approaches a point of extreme intensity and then gradually subsides, leaving the patient free from it for a varying interval until a recurrence takes place. Vomiting may be a symptom, but it is frequently absent; it is characteristic of that form which involves the small intestine only. At the onset of the trouble the bowels may move, usually small loose stools; later the motions consist almost wholly of mucus

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stained more or less largely with blood (characterized as presenting a red currant jelly appearance). Sometimes, however, the disease is accompanied by diarrhoea and tenesmus. Early in the disease the abdomen is not distended, it may even be retracted, but later on we have obstruction with tympanites, and stercoraceous vomiting may supervene. There may be a tumour palpable in the abdomen with a characteristic sausage shape, but this may not be present. Then again, in those cases where the invagination has become extensive, the apex of the intussusceptum may present through the anus or may be discovered by digital examination of the rectum. Intussusception may prove fatal in twenty-four hours, or it may exist for some weeks, becoming thus a chronic condition.

The above is a short outline of the condition which we have under consideration. I propose in this paper to give an account of a few illustrative cases, and from these draw some general conclusions. The first case from my note-book is one which came under my observation when House Surgeon some fourteen years ago in the Paddington Green Children's Hospital, London. It illustrates the possibilities so well as to recovery in extreme conditions that I venture to reproduce my notes here.

CASE I.—E. A., aged 5, admitted to Paddington Green Children's Hospital on October 13th, 1887. The child was one of six children in the family, all delicate and living in poverty. Twelve months before admission the child had attended the out-patient department for prolapsus recti, of which he had apparently been cured after a prolonged treatment, and the bowel had not been "down" for six months until the day of admission. For two and a half months before admission he had attended as an out-patient, complaining of symptoms indicating serious abdominal trouble. He had pain in the abdomen, he had lost all appetite for food, he had loose movements of the bowels, but no continuous diarrhoea. He failed greatly in flesh, vomiting attacks occurred from time to time. For the week before admission he was much worse, the pain became excessive, the motions offensive. These were usually light in colour, but sometimes they were noticed to be quite black, but never red. The vomiting attacks became more and more frequent. About an hour and a half before admission the bowels moved. The motion was said to contain some blood. An attempt was made to return the bowel, but this was unsuccessful.

On admission I made the following note of his condition: The patient was in a state of collapse, the pulse could hardly be felt at the wrist and he was lying in a semi-comatose condition, his eyes bright and glistening and his pupils contracted, the whole surface of the body cold and the face pale and haggard, whilst the body was greatly emaciated. A large mass the size of one's fist protruded from the anus. This mass was quite cold, but not gangrenous. An attempt was made at reduction, but the child strained and it was found impossible. A piece of gut presented in the centre of the pro-

truded mass, which was of small diameter and apparently small intestine. The finger could readily be passed between the protruded gut and the sides of the rectum, the rectal walls being quite smooth and apparently normal. An hour and a half after admission Mr. Stanley Boyd, under whom the patient was admitted, examined the child and found a tumour in the abdomen, extending up the left side, then across the abdomen just above the navel but not crossing the mid-line. Ether was administered and the protrusion was, without much difficulty, returned into the rectum. The nozzle of a Higginson's syringe was then introduced through the anal aperture and surrounded with tow to prevent the air from escaping. Insufflation was proceeded with, and by this means the intussusception was to some extent reduced, until nothing was felt but a tumour some six or eight inches long, extending from a point rather to the left of the middle line towards the right iliac fossa, but no further progress was made. The swelling had entirely left the sigmoid and the right lumbar regions and now occupied variably the upper and lower umbilical regions, and the right lumbar. This reduction had been effected not only by insufflation (which was imperfect) but by kneading and pressing the distal end of the intussusception between the fingers and thumb through the abdominal wall; it could be well taken hold of and could be seen through the wall as a distinct mass. The child's respirations stopped and the pulse became feeble. Operations had to be abandoned temporarily and artificial respiration commenced and continued for over half an hour before the child came round. Ether and brandy were injected hypodermically and heat applied to the abdomen. Ether was again administered and an attempt made to reduce the tumour by the injection of hot water, but this failed utterly, as did also a further attempt with insufflation. There still remained a small tumour on the right side. Tincture of opium (5m.) was given and brandy, egg and milk administered during the night. The following morning, fourteen hours after admission, the condition of the patient had not much changed, and Mr. Boyd decided to operate. Laparotomy was performed by an incision in the middle line. Small intestine presented in the wound, and it was found necessary to pull this out until the intussuscepted portion was reached; a large amount of small intestine was handled before this was accomplished. The small gut above the intussusception was much larger than higher up, and had a darkish look as if containing some dark contents; the peritoneal surface was normal. The incision was prolonged upward through the umbilicus, and the whole tumour was then lifted out of the abdominal cavity and laid on the surface of the abdomen and surrounded as much as possible with hot sponges. The ensheathing structure was found to be large intestine containing invaginated gut. Mr. Boyd tried first to pull out the intussusceptum and to work the sheath back over it, but he failed. The large gut was then seized below the intussusception and the sheath was, with the other hand, pushed down over this.

Thus the intussusception was attacked from below and the ensheathed piece of gut was gently squeezed out of the large intestine. This was accomplished without any great difficulty. The advancing part of the invaginated gut was found to be the ileo-caecal valve and the vermiform appendix. These on escaping from the sheath were much swollen, had lost polish and showed small red spots. The abdominal cavity was washed with warm water at a temperature of 100 F., and the edges of the wound were brought together with silver wire sutures. The operation lasted about an hour and a half. Much collapse followed the operation, and brandy was given hypodermically and per rectum. The child gradually recovered from shock. The bowels moved on the third day after the operation and he subsequently made an uninterrupted recovery.

*Comment.*—This case illustrates the ileo-caecal type of intussusception and undoubtedly was of chronic character, the symptoms having persisted for some time before operation. It illustrates also the fact that in such cases the ileo-caecal valve and the vermiform appendix may actually protrude at the anus. This condition might readily be mistaken for prolapsus, as it was by me when I first examined the child, but a more careful examination readily revealed the error, as one could easily determine the fact that one had to deal with invaginated bowel in the rectum. The possibility of error in diagnosis is, however, well worth noting. A more favorable prognosis may be given in chronic cases than in the early stage of the acute attack. It is probable that in chronic cases there is a series of relapses after a similar series of spontaneous reductions, consequently we do not get complete obstruction of the bowels, and, what is far more important as affecting the result of operation, the adhesions are not as strong in chronic cases as in acute, and the intussusception is therefore, contrary to what we might anticipate, more readily reduced in the chronic cases, and the danger of injury to the bowel is also much less. In chronic cases the vitality of the bowel wall is good, whilst in acute it may be approaching gangrene. Here, too, we find that even when diagnosis is certain it is difficult, even after opening the abdomen, to locate the tumour and bring it into the wound. No time should be lost, and if the tumour is not readily brought into view the intestine should be brought out on the surface of the abdomen and overhauled until the tumour is reached.

CASE 2.—P. McC., a boy fifteen months old, came under my care in the Hospital for Sick Children, Toronto, on April 20th, 1899, with the history that on the previous day the mother thought he had some slight digestive disturbance and towards evening administered a dose of castor oil. At two o'clock the following morning the bowels moved freely and naturally. Towards daylight the boy seemed to have some abdominal pain, and at 10 a.m. he passed a considerable amount of blood per rectum. The motion seemed to contain nothing else save blood. He vomited about the same time, and the vomiting persisted more or less all day. He

was admitted to the hospital late in the afternoon, when an enema was administered, as the result of which he passed a small quantity of blood mixed with mucus. This material resembled red currant jelly in appearance. Two doctors who had seen the child in the afternoon had each made a rectal examination and reported that on withdrawing the finger it was covered with blood in considerable quantity. Nothing further was detected by rectal examination.

When the child was first seen by me (about twenty-four hours after the onset of symptoms) he was in a very lethargic condition; one could rouse him, but he seemed absolutely indifferent to his surroundings and did not appear to be suffering any pain. The abdomen was somewhat tense, but not markedly so. Palpation was readily conducted without any resistance on the part of the patient. There was some wincing on deep pressure over the right side of the abdomen. A tumour was felt in the right part of the abdomen, well to the right of the umbilicus and a little above it. The limitations of the tumour were well defined; it seemed to be rounded and about the size of a pigeon's egg. The percussion note over this was tympanitic. The liver and splenic dulness was normal.

At 9 p.m. chloroform was administered and the nozzle of a ball syringe was introduced into the rectum and air pumped in. It readily inflated the ascending, transverse and descending colon, these various portions of the gut becoming visible on inspection of the abdomen as the air travelled on. It was difficult to say whether the air passed the ileo-cæcal valve or not, and the tumour could still be felt in the right lumbar region. It was therefore deemed advisable to open the abdomen. An incision was made in the right semilunaris. The cæcum came into view, not in the right iliac fossa but slightly higher up. I pulled this into the wound without much difficulty, and on making traction upon it the ileum came into view. This was very deeply congested, almost a port-wine color, and presented a mottled appearance. This condition existed for fully six inches of the gut, and there stopped abruptly. On feeling the piece of gut between the finger and the thumb it was found to be greatly thickened, and firm like a piece of leather, and seemed three times as thick as the normal gut. This condition of thickening and congestion existed up to the cecum, but stopped there abruptly. The mesenteric glands of this part of the intestine were enlarged, some of them as large as an almond, and very hard.

It was evident that on pulling the cecum forcibly into the wound, an ileo-cæcal intussusception had been pulled out of the cecum during the manipulation, the traction on the cæcum and the squeezing of that structure in the wound having effected the reduction. The tumour, which had previously been present, no longer existed. The abdominal wound was closed by silk-worm gut sutures. The child made an uninterrupted recovery.

*Comment.*—The case illustrates the diagnostic value of blood mixed with mucus. It is clear that there may be a copious outflow of blood from the congested mucous membrane; in other

cases, however, the amount of blood may be very small. One must not judge of the extent of the trouble by the amount of blood passed per anum. In this case a very small involvement of bowel led to a copious passage of blood. The position of the tumour in this case indicated an ileo-cæcal or ileo-colic type of limited extent, "well to the right of the umbilicus and a little above it." This, however, is not as definite as would at first appear, as an intussusception confined to small intestine might occupy a similar position. The value of treatment by inflation with air is doubtful. In this case, where the tumour was of small size, it was somewhat difficult to say exactly what effect was produced at the point of intussusception. There seemed to be some diminution of the tumour, and the question arose as to whether what was left was not due to thickening of the bowel wall and mesentery there. As doubt existed, however, the abdomen was opened and unreduced intussusception found. In addition, one must always remember that there must always be a certain amount of risk in inflating bowel which possibly may be on the point of gangrene, when rupture may readily occur. In any case, inflation should be attempted with extreme caution, and if any doubt exists as to its efficacy one should proceed without a moment's delay to open the abdomen.

CASE 3.—Baby P—, aged five months, was admitted under my care to the Hospital for Sick Children, Toronto, on December 16th, 1899. On the previous day the mother had administered a purgative, and, as the bowels did not move, Dr. Hunt was called in and administered a dose of castor oil (a tablespoonful). In the evening the bowels had not moved and an enema was administered, but failed to give relief. There was marked abdominal rigidity and the child was very ill and quite cyanotic. One could not find any abdominal tumour, but there was marked dulness in the lower part of the abdomen and towards the right side and the right iliac fossa. Chloroform was administered and the urine was drawn off by catheter. On rectal examination nothing abnormal could be felt. I proceeded to operate (about thirty-six hours after the onset of symptoms). I made an incision in the middle line, but could feel nothing abnormal by exploring with the finger in the wound. I then pulled out a loop of small intestine, and proceeded to overhaul the intestine, bringing more and more into the wound, until I found, about twenty-four inches from the duodeno-jejunal juncture, a loop of the small intestine, constituting a well-marked volvulus. This was readily undone. It was sufficient to cause complete occlusion of the bowel. About six inches higher up there was an intussusception which involved four inches of the gut and was reduced by traction with very little force. About six inches still higher there was a second intussusception involving also about four inches of the gut. In this instance considerable traction was necessary to undo the invagination, some adhesion having undoubtedly occurred, although there was no marked deposition of lymph observable on the serous surface. The gut above this point was



greatly distended, whilst below it was markedly collapsed and presented a curiously pitted appearance. After undoing the intussusception gas was readily caused to pass on through the affected portion of the intestine. The wound was closed with silk-worm gut sutures. The bowels did not move after the operation. The child died sixteen hours subsequently. A *post-mortem* could not be obtained.

*Comment.*—We here have a case of multiple intussusception of the small intestine. This is the condition so frequently occurring in the dying. The infant, however, had complete obstruction, for which no other cause was assignable, and these symptoms had existed some forty-eight hours before operation, whilst again the child lived sixteen hours after operation. Intussusception is in my opinion a much more frequent cause of obstruction in young infants than we have heretofore imagined. One is forced to believe that it is not always diagnosed. Is it possible that certain of the cases in infants which we have hitherto related to the class of "intussusception occurring in the dying," are really primary ones of intussusception, bringing about a fatal issue from that cause alone, and possibly remediable by operation if diagnosed sufficiently early?

*Treatment.*—Briefly we may consider the methods at our disposal for dealing with a case of intussusception. Medicinal treatment is of little avail. Opiates have been advised in large doses. Here as always, however, opiates are apt to mask symptoms by giving a less serious aspect to the case and thus, perhaps, causing delay in active operative measures. This in itself would certainly not countermand the use of opiates, but as no special service can be served by such treatment, unless it be in cases where pain is excessive, we prefer, if possible, to withhold this drug. Once a certain diagnosis of intussusception is made, one must initiate some method of undoing the invagination. Inflation of air or injection of fluids per rectum may be tried, but with the caution already advocated in this paper. If one now has any doubt as to the reduction in its entirety of the intussusception, cœliotomy must be performed without further delay. The method of dealing with the condition, after opening the abdomen, has been illustrated by the preceding cases to some extent. In all of these reduction was accomplished through the abdominal wound. This is not always possible, as one may have gangrenous gut to deal with, or adhesions so strong that they cannot readily be broken down. Under such circumstances the methods at our disposal are numerous and one must judge on the merits of the individual case as to the means we are to adopt. It may be necessary to resect the intussusception in part or in its entirety and then perform an anastomosis; or one may perform an anastomosis without resection, or an artificial anus may be established. Barker, of University College, London, advocated a method of procedure which has proved of value. He incises the intussusciens and draws through his incision the intussusceptum.

The greater portion of this is resected, and upon introducing sutures the remainder is reduced and the incision in the intussusciens sutured. Greig Smith suggested a modification of this, in which he resected the apical portion only. He was led to restrict his resection to the apex of the intussusceptum, because this, which is usually found greatly swollen, is the principal obstacle to reduction. After removal of this portion reduction of the remainder is often readily accomplished.

The technique of all these methods is so fully described in all text-books that it is unnecessary for me in this paper to give it in detail. Let me say, however, that recently Kerstan has reported a case in the *Centralblatt für Chirurgie* which is a distinct advance. Barker's incision was made for the purpose of resection, but after incising the intussusciens Kerstan found it possible to reduce the intussusceptum through the incision. We may, therefore, remember the possibility and, when the condition of the parts permit, we may stop short of resection. The undoing of adhesions is greatly facilitated by working through the incision in the intussusciens.

Kerstan's case occurred in an adult, a man thirty years of age, with a history extending over two months before operation. On opening the abdomen blood-stained pus was found about a tumour in the peritoneal cavity. The intussusceptum consisted of the transverse colon, the ascending colon, the cæcum and the vermiform process, and 25 cm. of the small intestine. An incision was made in the intussusciens, which consisted of descending colon and sigmoid, in order to resect the intussusceptum. This was made with the Paquelin cautery and was extended for 15 cm. It was found possible through this incision to undo the invagination and the condition of the intussusceptum was found to be remarkably good, much better than the intussusciens, in fact. The reduction having been completed the incision in the intussusciens was closed. The man recovered from the operation with a faecal fistula, which subsequently closed spontaneously.

One must remember the rare possibility of spontaneous cure in intussusception. The intussusceptum may be cast off in a gangrenous condition and passed per anum. Recently a Russian surgeon, Segal, reported a case of this character occurring in a man fifty-six years old in whom an intussusception occurred and was cured spontaneously, the patient having passed per rectum large portions of the intussusceptum.

Selected Articles.

**THE USE OF HYDROZONE AND GLYCOZONE IN GASTRIC  
AND INTESTINAL DISTURBANCES.**

BY W. H. VAIL, M.D.,

*Medical Examiner for Fraternal Mystic College, Philadelphia, Pa.; Assistant Editor St. Louis  
Hospital Bulletin; Visiting Surgeon to Mayfield Sanitarium; House Physician  
for Wm. Barr Dry Goods Co.*

I HAVE, for a long time, been very enthusiastic over the value of Hydrozone and Glycozone in treating diseases, and can attribute much valuable assistance and extraordinary results from their use in the last few years. The medical profession, in fact, has never gained such remarkable results from the employment of any production as it has from the use of these preparations, and my recent effects have almost, in a measure, surpassed them all. I will give a brief report of one remarkable case. I could mention several others, but a physician's time is valuable, and often he has not the moment to spend in perusing a legion of cases, so I select this one, it being the severest of all, to demonstrate the potency of Hydrozone and Glycozone:

I was called to treat a young man, suffering from a severe gastro-enteritis. I found him in a most serious condition, having been delirious for three days. His temperature was sub-normal, 97.6, pulse 60, respiration 16. He was greatly emaciated, atonic, had inappetence, a severe agonizing pain in the stomach and intestines, at times so severe that he would sit on the edge of the bed and groan, oftentimes yell. These attacks were always of a similar nature and occurred regularly. He was unable to take either solid or liquid food, even in small quantities, without causing a return of the pain, a teaspoonful of milk being sufficient to produce it. His condition was pitiable. His cheeks were hollow, eyes congested, skin pale and sallow, and his whole appearance showed the presence of intense pain.

I was called at the end of the third week of his illness. The former physician employed opiates in large doses with most worthless results, also many other drugs, with not a sign of improvement, he growing seriously worse. I determined that Hydrozone and Glycozone were the remedies indicated, and were the only ones that would be of value here, therefore I gave him, at once,

one-half glass of a mixture of one-half ounce of Hydrozone with a little honey, to one quart of water. He was somewhat disturbed for a while after the portion, but was soon relieved. The distress, I presume, was due to the advanced stage of the inflammation. I continued to administer this for some time, with only a slight improvement, but after several doses had been taken, the relief was very decided. After his nourishment, I gave one teaspoonful of Glycozone in a wine glass of water. After a few doses of this he was much easier and, at midnight, fell asleep and slept all night, not awakening until morning, the first sleep that he had had in five days. I had previously discarded all other remedies, of which there was a large number, as one after another was given with no benefit. All of the acute symptoms disappeared in a few days, at which time he felt very much better, and he continued to improve without having a recurrence of any of his old severe symptoms. Before this, I had increased both the nature and the quantity of his food, which he relished greatly. I continued the Hydrozone and Glycozone for a month after, to entirely reduce the inflamed condition of the mucous membrane of the gastro-intestinal tract. These two remedies have afforded me most excellent issues many times in the treatment of gastric and intestinal disorders.

All gastric and intestinal disturbances are caused by the lining of the stomach becoming inflamed, and in order to allay this inflammation, it must first be treated with antiseptics, then with medicaments that both heal and stimulate the mucous membrane that has become diseased. The most common cause for this state of inflammation is a greatly diminished quantity of gastric juices necessary for digestion, consequently, the food partaken of, instead of being assimilated, ferments—in other words, the peptic glands, whose function it is to secrete the gastric juice, do not perform their function properly. These must be restored to their normal state at once, which is accomplished by remedies that exert a stimulating effect upon them, and at the same time, are non-toxic, else the trouble will only be aggravated. Hydrozone and Glycozone are the two remedies par excellence for these two purposes, and the success that I have obtained from the employment of them during the past few years will lead me to always use them in these disorders.

Hydrozone causes destruction of microbes, has no deleterious action upon animal cells, possesses no toxic qualities, exerts no corrosive effect upon healthy mucous membranes when used in diseases caused by germs, is a pus destroyer and a stimulant to granulating tissues. Hydrozone is destruction itself to the skin or mucous membrane that has become diseased, and leaves the subcutaneous tissues in a perfectly healthy state.

Glycozone, while not so rapid in its action as Hydrozone, is, nevertheless, just as sure a stimulant, and in all gastric and intes-

tinal disorders, exerts a potent and uninjurious effect upon the diseased mucous membrane of the stomach, healing it to a nicety. It is an effective oxidizing agent, has an agreeable, sweet and, at the same time, slightly acid taste resembling lemonade. Its use produces no deleterious action on the heart, liver or kidneys.

The beneficial results which Hydrozone and Glycozone have afforded me in the treatment of this class of disorders have caused me to discard all the other methods of treatment by drugs that exert an ephemeral influence but do not jugulate the offending condition. What is needed in these diseases is an antiseptic that will destroy all pathogenic germs, and at the same time stimulate the walls of the stomach. Hydrozone kills the bacteria, dissolves the mucus, and prepares the stomach to better digest the food, in short it deterges the stomach, hence in it we have an efficient antiseptic; Glycozone removes the mucus from the walls of the stomach, stimulates and heals. I have discovered these two preparations to be ideal ones in treating this very common and distressing disorder.—*Selected.*

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### HYPERIDROSIS AND ITS TREATMENT.

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HYPERIDROSIS, or as known to some, Hydrosis, is a functional disorder of the sweat glands, resulting in excessive perspiration. It is a condition for the relief of which physicians are frequently consulted. It may be general, but more often is a purely local affection, *e.g.*, of the axillæ, and still oftener of the feet, in the latter case giving rise to fetid odors, rendering the presence of the individual nauseating to any person coming into contact with him. There are certain constitutional aspects of the case which have to be borne in mind if the patient can expect permanent relief, but the local treatment is, as a rule, of greatest importance.

James A., aged 41, consulted me August 13th, 1900. He complained of very tender feet, so tender, in fact, that he felt he would have to give up his work unless he was soon afforded relief. He had been a farmer all his life up till last spring, when, getting tired of that occupation, he came into Toronto and secured employment with one of the railroads. His work necessitated heavy lifting, and he never worked less than 10 hours a day. He was not long "at the job" till he found that he would commence limping round before noon of each day, and by "quitting time" he would be quite lame. As soon as he reached home at 7 p.m., he took off his boots and socks, and went around all evening with nothing but a pair of slippers on. He said that that was the only way in which he got relief. Week after week he got worse, till he had to give up the work altogether, and take a rest. When his feet were examined they were quite congested and tender to the

touch. There was a very disagreeable odor arising from his socks and boots, notwithstanding the fact that my patient stated that he changed his socks every morning and washed his feet in ice-cold water every night. I advised him first of all to purchase a very easy pair of boots for himself, a pair about two sizes too big for him, and told him to wear a good soft wool sock, so that the perspiration would be absorbed, and not harden upon his feet as it would be if he continued to wear cotton socks. I directed that he should take at least two weeks' holiday, and remain as much as possible at rest during that time. The old stinking socks and boots I had him destroy. I prescribed some simple diachylon ointment to be spread upon linen and applied to the feet, with pledgets between each toe; over that he drew a light wool sock and his new loose boot, just laced and no more, exercising but little pressure on the foot. At the end of twelve hours the dressing was removed, the foot rubbed dry with a cloth and dusted with pure starch, with chloral hydrate in it, one drachm to the ounce. This treatment was kept up for eight or nine days, and he again reported himself to me. He said that the ointment seemed to allay the burning and itching in the feet, but that the odor was still quite perceptible. By this date the superficial epidermis had begun to peel off the areas affected with the disease, and in a few days thereafter, but not until then, did I allow him to wash his feet with soap and water. At the end of his two weeks' "leave of absence" he reported being much better, but was not well enough to return to work. I modified the treatment, therefore, by having him strap his feet with lead plaster every day for a fortnight, meanwhile putting him on small doses of picrotoxin internally. In ten days he reported again to me, and said he did not see any material change for the better. I examined his feet, and found that the superficial layers of skin had again peeled off, and had left what was apparently healthy skin underneath. His feet, were, however, exceedingly tender to pressure; whether that was due largely to the loss of the epidermis a second time or not I was unable wholly to determine. I then stopped the picrotoxin internally, and gave him a good tonic mixture of iron, quinine and strychnia, and prescribed Fox's lotion of 1 per cent. of quinine in alcohol, to be applied to both feet twice daily, and immediately after it evaporated I had Tyree's compound antiseptic powder thoroughly rubbed into the feet, and in between the toes, and also freely dusted into both socks. He promised that he would use my prescriptions assiduously, and come back in two or three weeks. I received a letter from him in about ten days' time to say that he had removed to a neighboring town, where he had lighter work. He added that he thought he was better than he had been for some little time. He came into the city one day a month later, when he had a holiday, and called at my office. He

said he was almost entirely well, "thanks to the last medicine." I examined his feet and found not only an absence of all odor, but noticed that the tenderness had almost entirely disappeared. He told me that he was now able to work all day long and, except that his feet "felt tired" at night, he had none of the soreness, not to speak of the itching, from which he had suffered six or eight weeks before. I instructed him to keep up both the iron mixture and the compound antiseptic powder (a combination of borate of sodium, alum, carbolic acid, with some eucalyptus and thyme) for another month, when I had every hope that he would be entirely and permanently well.

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### IODIPIN.

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DR. VICTOR KLINGMULLER, assistant at the Breslau University Clinic for Diseases of the Skin—Dr. Neisser, Director—reports (*Deutsche med. Wochenschr.*, Vol. XXVI., p. 423) the results of further observations on the treatment of a very large number of cases with iodipin (iodized sesame oil).

Of all the methods of administration, by far the best, the author states, is the subcutaneous; and during the past year and a half, over 100 cases were so treated, the number of injections amounting to between 800 and 900. These cases comprised 20 of secondary syphilis, 3 of malignant and 55 of tertiary syphilis, 5 of psoriasis, 1 of antinomycosis, 2 of leprosy, 8 of questionable syphilis (tabes, paralysis, and hepatic affections), 2 of syphilis complicated with nephritis, and 1 of bronchial asthma. Besides these, a number of patients who required treatment with iodides, also received iodipin. The injections were made with the 25-per-cent. iodipin, which was first somewhat warmed so as to render it more fluid, and thus more readily forced from the syringe. This latter should have a wider orifice than usual, and the canula, too, should have a large lumen, and should be from 2 to 3 inches long. This length enables a deep injection to be made, whereby more perfect closure is obtained on withdrawing the canula, and the iodipin is prevented from being forced out again by the subcutaneous pressure. The best site for the injections is the gluteal region. After inserting the canula, the syringe is removed, the canula being left in place. This is for the purpose of observing whether any blood, or the iodipin contained in the lumen, exudes, and thus avoiding all danger of incurring an embolism. The skin where the puncture is made does not require to be anesthetized. All that is necessary is to rub the spot vigorously with a pledget of cotton moistened with ether. After the injection no pain whatever is felt, but only a slight sensation of pressure, which disappears after

a light massage has dissipated the injected iodipin. The iodipin remains perfectly sterile, and no inflammation, infiltration, or abscess, was ever observed, either on man or beast, in all the numerous injections practised. When the cure was to be energetically pushed, 5 drams of the 25 per cent. iodipin were daily injected for 10 days in succession, and then stopped; or, injections were made every other day, and a greater number made. These quantities were sufficient for the energetic treatment of tertiary syphilis; 5 drams of iodipin every second, third, or fourth day, for 18 times, was excellently borne by a paralytic; and even 8 to 10 drams may be repeatedly injected without causing any disturbances.

So far as by-effects are concerned, no iodism was observed, even in the slightest degree, in any case. When using potassium iodide, a number of cases were observed in which catarrh, headache, etc., were observed; even in these cases iodipin subcutaneously caused not the slightest appearance of these symptoms. So also two cases of tuberculous lepra, which exhibited specific idiosyncrasy toward iodides, failed to react with iodipin subcutaneously administered. The extent to which the remedy may be given speaks for its non-toxicity; no pernicious effect has ever been noted, nor has any loss of weight been observed; the stomach and intestines remain entirely uninfluenced, while the appetite remains perfectly unaffected. It is just in these respects, viz., that iodipin subcutaneously causes no by-effects, is non-toxic, and yet exerts a specific action, that this remedy in this form of exhibition is so superior to the other iodine preparations.

In lepra and psoriasis the results were unsatisfactory. A case of bronchial asthma which came under treatment because of an eczema, reacted splendidly, however; the attacks remaining absent for several days after an injection. Brilliant results were also obtained in facial actinomycosis, which was completely cured. In secondary cases of syphilis of older forms (papulous, pustulous, and papulo-pustulous) the treatment was combined with mercurials. The number of cases treated, however, and the results obtained, are not sufficiently pronounced to enable a definite judgment to be given. No disturbing by-effects from the combined treatment were seen in these cases. For tertiary syphilis, the author considers iodipin to be a specific. The investigations which were made in 50 cases were exceedingly satisfactory, and have led to the use of the subcutaneous injection, wherever possible. It does not even appear to be necessary to administer iodides per os when first beginning treatment, as was first stated. By the subcutaneous method it is possible to liberally provide the organism with iodine even for months without any disturbing by-effects ever being made manifest. The author hence believes that in tertiary syphilis, iodipin subcutaneously is bound to come more and



more largely into use. It is in the treatment of visceral syphilis, however, that the iodipin appears to be above all adapted, says the author. This is because the iodipin is carried to the remotest parts of the body, and is deposited also in all the visceral and other organs (marrow, muscle, liver, etc.) as well as in the fatty tissues, where the iodine is then split off to enter the circulation. The author concludes that subcutaneous exhibition of iodipin is bound to constitute an exceedingly prominent means of administering iodine. The method is convenient, and the iodine action certain, energetic, and prompter than with other iodine preparations, while no by-effects whatever supervene.

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DR. E. H. STAFFORD "blew in" to the office of the JOURNAL one day last month. The Doctor has spent the last few months in Lincoln, Nebraska, finishing his "History of Medicine." He left ten days ago for New York and Paltimore, around which "villages" he will spend the next six or eight weeks.

DR. W. H. PEPLER desires to announce to the medical profession that he is prepared to receive patients requiring hot air treatment. The doctor has arranged the necessary facilities for the administration of the Tallerman Hot Air Treatment (as practised at the Tallerman Institute in London), at 396 College Street, and will be pleased to give medical men all particulars on application.

THE Senate of Toronto University have approved of Dr. W. J. McCollum, Dr. W. J. O. Malloch, Dr. A. W. Tanner, Dr. W. H. Piersol, Dr. A. A. Small, Dr. S. J. Westman, Dr. E. R. Hooper, and Dr. W. J. Wilson as assistant demonstrators in anatomy for the present session. Also of Dr. J. Stenhouse, Dr. Silverthorn, and Dr. W. J. Wagner, as assistant demonstrators in pathology. Of these, Drs. W. H. Piersol, W. J. Wilson, Silverthorn, and W. J. Wagner are new members of the staff.

MEDICINE AS AN ART AND AS A SCIENCE.—Dr. Pye-Smith (*Medical Review*, August) in his Address in Medicine at the recent annual meeting of the British Medical Association, said that the physician should never forget that he practised an art. He must never allow theories, or even what appeared to be logical deductions, or explanations, however ingenious, or statistics, however apparently conclusive, or authority however venerable, to take the place of the one touch-stone of practical medicine, experience. He should never treat the disease without considering the patient, for the art of healing was the art of healing individually. If, however, medical science without art was inefficient, medical art without science was not only unprogressive, but almost inevitably became quackery.—*N. Y. Med. Jour.*

# The Canadian Journal of Medicine and Surgery

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Doctors will confer a favor by sending news, reports and papers of interest from any section of the country. Individual experience and theories are also solicited. Contributors must kindly remember that all papers, reports, correspondence, etc., must be in our hands by the fifteenth of the month previous to publication.

Advertisements, to insure insertion in the issue of any month, should be sent not later than the tenth of the preceding month.

VOL. VIII.

TORONTO, NOVEMBER, 1900.

NO. 5.

## Editorials.

### COD-LIVER OIL IN TUBERCULOSIS.

THERE can be no doubt that the ingestion of fatty food is of the first importance in the prevention of tuberculosis, and most practitioners admit that fat, in some form, yields good results in the treatment of that disease. Dr. Hughes Bennett was probably near the truth in observing that "the main causes of tuberculosis are the dearth of butter and the abundance of pastry cooks," intimat-

ing that the poor and underfed are unable to obtain sufficient fat, while the digestion of the wealthy class is deranged by pastries, so that they are unable to assimilate a proper amount of fat. Oils of animal origin, being more assimilable than vegetable oils, are preferable when an effort is being made to improve defective nutrition. Hence we find that, at German sanatoria, where cod-liver oil is not much in favor, butter, cream, yolk of egg, hog's lard, beef lard, the fat of ham, and even goose grease, are employed to fatten tuberculous patients. The use of these animal fats, doubtless, renders important services to patients who cannot tolerate cod-liver oil.

There are many excellent reasons for using fat in the treatment of tubercular cases. For instance, when a tubercular patient develops fever, he begins to consume an abnormal quantity of calories, as has been shown by Quinquaud, in his researches on the quantity of carbon dioxide exhaled during fever. This supplementary expenditure of calories explains the fatigue experienced by the tubercular patient after taking a little exercise. If he takes the rest cure, this expenditure of calories is diminished, but then another inconvenience arises. To antagonize the cooling effect of complete rest on the human organism, a fresh expenditure of heat is called for; so that, as a matter of fact, the rest cure cannot be carried on satisfactorily, unless overfeeding is also practised, the patient using particularly foods rich in oleaginous material.

While its taste is repugnant to many persons, cod-liver oil is more readily absorbed and oxidized than any other fat. "It has already been prepared by the liver and, therefore, partly elaborated and, owing to the biliary salts which it contains, it passes more readily through animal membranes. Moreover, Naumaun has shown that cod-liver oil is more readily oxidized than any other oil, rendering this substance an ideal ready-made food" (Butler).

The question of its agreeableness to the taste is of the first importance, and the allied question of its tolerance by the stomach is not inferior in interest. When cod-liver oil, in large doses, is well borne, and does not cause either gastric or intestinal disorder, it is a most useful addendum to the usual food of the tubercular patient. All observers agree that tubercular patients who bear cod-liver oil well, make rapid progress toward recovery. It must be remembered, however, that this substance is a food and not a

medicine. It is, therefore, contraindicated in all diseases in which it proves detrimental to the appetite or when it provokes eructations, heartburn, diarrhea, etc. It is usually contraindicated in fevers, owing to the suspension of the secretions and impairment of digestion, characteristic of acute febrile disorders, although in such cases it might be administered by inunction, especially as its local use lowers fever heat.

In addition to its use as a fatty food, easy of assimilation, the utility of cod-liver oil in tubercular and wasting diseases may be due to the action of phosphorus in a special combination, or to the influence of the hepatic antitoxins which it contains. A peculiar principle found in considerable quantity in light-colored fresh oils is gaduin. Gubler considers that gaduin and glycogen are similar bodies. "The presence of gaduin ought, therefore, to favor the absorption of cod-liver oil, and it may confer upon it antitoxic properties as well" (A. F. Plique).

Much interest attaches to the chemistry of the alkaloids, amylamine, butylamine, aselline, morrhaine, etc., which are extracted from the dark-colored oils. These alkaloids are not present in the bright yellow oil, such as flows from fresh livers, and may prove to be decomposition products. On the other hand, the fresh light-colored oil is richer than the darker oil in mineral elements, particularly phosphorus and iodine. It is also said to have more therapeutic value (Maigne).

The great interest attached to the chemical compounds contained in cod-liver oil sufficiently explains the efforts made by chemists to prepare extracts of this substance. Different methods of manufacturing those extracts are employed, and some very elegant preparations have been put upon the market. Speaking of them as a class, Plique says that, "while these extracts contain phosphorus, bromine and iodine, in relatively large quantities, they lack the fat and also an important medicinal element, gaduin."

Whatever the correct theory of the efficacy of cod-liver oil in tuberculosis may be, an important point to remember is that small doses are of no therapeutic value. The French clinician, Jaccoud, obtained his best results by employing enormous doses (3.5 to 8.5 ounces per diem).

The conviction that few patients can tolerate such doses may be the reason why German therapeutists have shelved cod-liver

oil and now employ other animal fats in its place. A practitioner must, therefore, use his own judgment as to the likeliest way to secure the superior fattening properties of cod-liver oil for a patient suffering from a wasting disease, without disgusting his sense of taste, or upsetting the functions of his digestive organs. In addition to a diet containing measured quantities of butter or cream, fresh, bright-colored cod-liver oil may be administered in capsules or in emulsion. The extracts of cod-liver oil may, if preferred, be given in capsules, or in a wine; but it seems necessary, that the requisite quantity of oleaginous material should be also given to the patient, in form of an appetizing fatty food.

J. J. C.

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### PATENT MEDICINES.

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WE understand that a bill introduced during last session of the Ontario Legislature to regulate the sale of patent or proprietary medicines or cures, is to be brought forward again during the next session. In the preamble, Mr. German, who is the member to introduce the bill, says that its object is to protect the public against the fraudulent or improper advertisement of drugs, medicines or cures, and against the sale of such as contain hurtful ingredients. With this end in view, he proposes to have a provincial inspector appointed, to be known as the Registrar of Proprietary Medicines, who shall be a member of the Ontario College of Pharmacy, and a regularly qualified pharmaceutical chemist of at least seven years' standing. This official's duty shall be to grant licenses for the manufacture of these articles. These licenses are to cost \$1,000 each, will have to be renewed annually, and will not be granted should the medicine be such as may prove harmful in the hands of a person ignorant of its composition. The bill further provides that no advertisement of a medicine shall be published which consists either wholly, or in part, of any surgical picture or representation which is of a nature to suggest the means of committing any crime, which is offensive in its language or suggestion, which is calculated to hold out false hopes of the prevention, alleviation or cure of any disorder of the bodily functions, or which is misleading in the statement of its curative properties.

The effect of this bill, if it should become law, would be disastrous to pharmacists who dispense private formulæ, such as

ough medicines, dyspepsia cures, corn cures, etc. It would not pay a retail pharmacist to invest \$1,000 per annum for such a purpose, and yet it seems hard that he should be deprived of the privilege of retailing a preparation which is really meritorious. The effect of such a law would be to restrict the manufacture of patent medicines entirely to owners of large concerns, who could afford to pay the tax, particularly as their own sales would be increased by the extinction of the opposition of their petty rivals.

It is not reasonable to suppose, however, that retail pharmacists are prepared to preside at their own commercial extinction. Counter prescribing will be indulged in to a greater extent than formerly, because, if forbidden by law to sell his own preparations over the counter, the pharmacist will compete with the physician in prescribing for the minor diseases, and will make up preparations intended to cure diseases, the nomenclature of which has been obtained from a physician or guessed at by the patient. Such a business would be more profitable to him than retailing the expensive preparations of the large concerns at a small advance. If the German bill becomes law, the newspaper publishers will lose heavily, for the patent medicine manufacturers are some of their best customers. However, with the growth of intelligence in Ontario, the reading public may not be in harmony with the pictorial and literary status of patent medicine, as expressed in newspapers and magazines. Should this opinion be correct, the press and the manufacturer alike will have to bow to the behests of the pharmaceutical *censor morum*, instead of following the self-taught inspirations of the past. Physicians will not, we think, profit by the operation of the contemplated law, the chief features of which are, however, deserving of their hearty support.

J. J. C.

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### BUBONIC PLAGUE.

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THE courteous letter of Dr. Montizambert, Director General of Public Health, which appears at page 349, will be of interest to our readers. The precautions taken by the department seem sufficient, and if carefully carried out ought to be effective. Should plague, however, appear in a Canadian port, we think that the disease could be promptly stamped out. The most important factor in such a preventive programme would be the diagnosis of plague in the sus-

pected case, and this may be accomplished by a bacteriological examination of blood taken by aspiration from the diseased lymphatic glands, the germ of plague when that disease is present being found in these tissues. Prompt action in such cases is all the more necessary, as persons ill with plague are sometimes treated for typhoid fever or pneumonia, until the true nature of their disease is discovered.

The Glasgow epidemic did not appear to be under complete control on October 7th. A special despatch from Glasgow on that date announced the discovery of another case of plague, in a part of the city hitherto free from that disease. A man who was brought to Glasgow from Govan-on-the-Clyde, just below Glasgow, and received at the City Hospital on September 30th, died there October 7th of bubonic plague.

The *British Medical Journal*, in an editorial (September 22nd) entitled "The Pandemic of Plague," shows that "the danger of plague infection will not cease when the Glasgow outbreak is at an end; it will continue while plague exists in Asia, or while it is prevalent in any centre in direct communication with the rest of the world, by land or sea." It was Oporto last year; it is Glasgow this year; and before the year is out some other city may be attacked.

We notice that Dr. Thomas, the United States Medical Officer at Glasgow, examines all ships before leaving for America, and allows none to sail without a clean bill of health. The United States authorities have been satisfied with this, and a further examination on arrival at this side, and have as yet detained no steamers, except to make the latter inspection. *We are not aware that a medical officer examines Glasgow ships prior to their departure for Canada.* Even though this precaution be taken, as intending passengers from Glasgow for this country may ship from Liverpool or elsewhere, and as there is no internal quarantine against Glasgow in the British Isles, the protection of Canadian ports from plague is a difficult matter.

The quarantine regulation, by which the captains of ships are enjoined to take the temperature of their crews twenty-four hours before their arrival in port, for the information of the quarantine officer, is most judicious. If a similar precaution were taken with the passengers of incoming ships, the danger of introducing bubonic plague or any other dangerous epidemic infection would

be minimized, because the initial stage of most infections, if present, would be reached, prior to the disembarkation of the passengers and crew in this country.

J. J. C.

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### DRUNKENNESS IN WOMEN.

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SEVERAL daily papers in the United States have lately drawn attention to an alleged increase of drunkenness among women. The *Chicago Journal* declares that this increase is very noticeable in that city. It says: "The explanation of this phenomenon is not difficult. As life has become more tense, more strenuous for women, the need, real or fancied, for stimulants has come upon her as it did upon men. It is the exceptional woman to-day who is not, in some sense, a business woman; for even the pursuit of society has become a business. With greater independence, heavier cares, and a livelier intellectual life than her grandmother enjoyed—or suffered—the twentieth-century girl may be expected to seek much the same method or securing relief or stimulus as her brother does.

"Doubtless this will be bad for the race. The alcoholic taint inherited from one parent has wrecked enough lives. If the danger be doubled, the gravity of the results will be enhanced. But it is an irrefutable proposition that if women are compelled to do an ever-increasing share of man's work, they will ultimately contract a share of man's vices, too."

A Southern paper, the *Atlanta Journal*, adds its testimony to the existence of a similar state of things in the Georgia metropolis, as follows: "It is said that there were more women on the streets of Atlanta under the influence of liquor last Saturday than the police had ever observed before in all their experience, and in our exchanges from other cities we see frequently accounts of women being arrested for drunkenness.

"The rather free indulgence of women in wine, and even stronger drinks at entertainments is one of the deplorable events of modern social life, and we fear that it is on the increase."

The proprietor of a fashionable New York hotel is quoted as saying that women guests give his bar a very large patronage by orders from their rooms, and that the drink habit among women of the higher as well as the lower classes is growing.

It would be pleasant to believe that such statements as we have



referred to are either entirely untrue or grossly exaggerated, but the frequency and emphasis with which they are made will not permit them to be brushed aside merely because it is painful to give them credence.

“What are we going to do about it?”

The *North American* says: “Physicians can do much to aid the man who desires to shake off the drink habit. They can attend to his general health, brace him up with tonics, quiet his nerves, regulate his diet, and tell him how to keep well. But up to date no medical device has been discovered that will cure a drunkard who does not bring his own will into play and keep it at work. The French have a saying that ‘he who has drunk will drink,’ and that is true of all but the few who rescue themselves from the vice by exercise of persistent will-power. There have been many pretended discoveries of drugs, or combinations of drugs, that, like this new French serum, were advertised to inspire an unconquerable distaste for alcohol, but none of them has stood the test of time. It still remains true that the only known sure cure for drunkenness is not to drink.”

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#### A DECIDED STEP IN ADVANCE.

THE following letter will speak for itself. A copy of it, along with a copy of the Report of the Committee on Hospital Abuse (which we have already printed for the benefit of our readers), has been sent to every hospital in the Province. We earnestly hope that all of the hospitals will deal promptly with this matter, and wipe out at once a fraud upon the Government, and a gross injustice to the medical profession.

W. J. W.

#### ONTARIO MEDICAL ASSOCIATION.

*To the Medical Superintendent and Board of Trustees:*

DEAR SIRS,—I am directed to forward to you a copy of the report of the Committee on Hospital Abuse, as presented at the 20th Annual Meeting of this Association in June, 1900.

The committee would be glad if you would report as to your position in the matter, and give any data that may assist them in their work, and in the preparation of a report for the Annual Meeting in June, 1901.

Yours truly,

HAROLD PARSONS,

Secretary.

72 Bloor St. West, Toronto.  
October 1st, 1900.

## EDITORIAL NOTES.

**Nutrition in Tuberculosis.**—In the section of general pathology (13th International Congress of Medicine), Richet declared that the results he had obtained with raw meat in the treatment and prevention of experimental tuberculosis in animals did not depend on overfeeding. He thought that the use of raw meat *stimulated the animal organism*, and favored the production of an antitoxin. Maragliano and Chantemesse expressed approval of this view. A report of experimental work done by Guinard of Lyons, showing the influence of an excessive amount of sugar on the progress of a tubercular disease, was read in the same section. Of two sets of guinea-pigs (30 in each set) inoculated with tuberculosis, one to which sugar was given, in addition to the ordinary food, perished more rapidly than the controls. Guinard thought that the fatal results were produced by a modification of the animal organic structure, through the operation of a special food, given in excessive quantities, to animals not engaged in any form of work, and suffering from an infection. He did not think that his experiments should be regarded as illustrative of a question of alimentation, for the facts adduced would then be absurd. The influence of proteid food in increasing resistance of the animal organism to tuberculosis being already known, Guinard thought that the opposite influence of hydrocarbons and sugar would be less surprising, as the experiments which show this unfavorable influence of sugar are in perfect accord with clinical observations, proving the gravity of tuberculosis in diabetic patients. The questions to be elucidated by further observations on the line of these two bacteriological reports will be important to those interested in the therapeutics and alimentation of tubercular patients. If Richet's experiments are confirmed, the consumptives will have to adopt a raw meat diet, and if Guinard's experiments prove to be reliable, they will have to renounce the use of sugar.

**Mosquitoes and Malaria.**—The *British Medical Journal* (September 22nd) says that Dr. Elliott, a member of the Liverpool expedition sent to Nigeria some time ago to investigate the subject of malarial fever, has returned to England. He reports that the members of the expedition have been perfectly well, although they have spent four months in some of the most malarious spots. They

lived practically amongst marshes and other places hitherto supposed to be the most deadly. They did not keep the fever off by the use of quinine, and they attribute their immunity to the careful use of mosquito nets at night.

We are very pleased to learn that Dr. Elliott, who is a Canadian, has helped by these experiments to enlighten medical opinion about the etiology of malaria, more particularly its transmission from patient to patient through the instrumentality of these insects, whose hypodermic inoculations are practised "in the dead waist and middle of the night." Dr. Elliott's observations ought to be of great interest, more particularly his views as to the reasons why the negroes in Africa escape, or at least, do not suffer as much from malaria as the white men visiting that country. That negroes do suffer from the plague of mosquitoes is clear enough. Thus, Ewart Grogan says, in a recent address before the Royal Geographical Society of England, that "The Dinkas (a tribe in the lake region of Africa) smear themselves with a paste made of wood ashes to protect their naked bodies from the mosquitoes." He also remarks that "The mosquitoes were appalling, and rapidly killed off two of my boys, who had been sick." Grogan also says, "The flies by day were even worse." As a plague to the traveller doubtless they were, but it has not been shown yet that the flies inoculate men with malaria, though their bites are savage enough.

**Extra-Buccal Alimentation.**—In the opinion of Ewald (13th International Congress of Medicine), extra-buccal alimentation is not sufficient to completely replace buccal alimentation in healthy persons. A failure in nutrition always results from it. In weakly people, in whom nutritive changes are diminished, extra-buccal alimentation increases the production of proteids and fat. This form of alimentation only succeeds when buccal alimentation has to be suspended for a time, or as an adjuvant system of diet. Nutritive injections given per rectum are preferable to those administered subcutaneously. Laborde, discussing this branch of the subject, said that albuminoids should never be given subcutaneously, as they always caused renal lesions when given in that fashion. Leube thought that oils and fats were the only forms of aliment which could be administered subcutaneously, and they might be thus given in daily doses of from 50 to 100 grams (1 oz.

334.16 grs. to 3 oz. 230.7 grs.). Oily substances were unsuitable for rectal alimentation. Albumen in the form of peptone (60 grams), 2 oz. 50.984 grs., 3 eggs + 46.2972 grs. of salt, in 10 oz. 254.7 grs. of milk, starchy food (15-20 grams to 100 grams of milk or water (231.524—308.648 grs. to 3 oz. 230.7 grs.)), were suitable quantities for these rectal injections, which should be administered twice a day.

#### **Rarity of Relapse After the Radical Operation for Hernia.—**

This subject, which is of the first importance to surgeons, and of intense interest to ruptured patients, was discussed at a meeting of the Surgical Society of Paris, the question having been introduced by Dr. Delbet (*vide Presse Medicale*, July 30). That surgeon had charge of the department for supplying trusses at the central office of Public Assistance from last January, and among the large number of ruptured patients seen there, kept a record of those who had suffered a relapse after undergoing the radical operation for the cure of hernia. Relapses proved to be very rare indeed, as out of 1,516 cases of inguinal hernia, there were only seven relapses, and out of 70 cases of crural hernia only two relapses. Three of the patients who had suffered a relapse had been operated on in the provinces; the six others had been operated on in Parisian hospitals, but, in no instance, by the leading surgeon. The subject was discussed by Drs. Lejars, Reclus, Delorme, Professors Ferrier and Poirier, who agreed with the essayist, that relapse after the operation for the radical cure of hernia is rare. The weak point about Dr. Delbet's statistic is, that he does not state what proportion of the patients whom he saw at the office of Public Assistance had been operated upon. It is unreasonable to suppose that all these patients could have been operated on for the radical cure of hernia.

**The Bacterial Treatment of Sewage.**—Dr. Houston, who, with Dr. Clowes, has conducted experiments in the bacterial treatment of sewage for the London County Council, has shown in a paper read at the sixty-eighth meeting of the British Medical Association (*vide British Medical Journal*, August 18th, 1900), that bacteria beds cannot be depended upon to remove the bacillus typhosus and other allied organisms. Many sanitarians thought that the new process of sewage disposal in bacteria beds would be cheaper and better than the chemical and precipitation methods. They sup-

posed that the effluent from the bacteria beds would be water restored to a comparatively clean condition, and also deprived of pathogenic germs, and that it could be safely discharged into streams. It now appears that the subsequent filtration of an effluent from a bacteria bed through a sand-bed, similar to those used for the purification of water, would be required, in order to materially lessen the danger of such effluent getting into the rivers.

**The Nerves which Control Micturition.**—At a meeting of the Society of Biology of Paris, reported in *La Presse Medicale*, July 28th, 1900, Dr. Guyon contended that the erector branches of the pudic nerve intervene in normal micturition, not only as motor, but also as sensory nerves. In other words, they represent at the same time the centripetal, as well as the centrifugal route of the excitation, which, determined by vesical tension, terminates in reflex contraction of the bladder and expulsion of its contents. The reflex nerve centre of the bladder excitation is situated in the spinal medulla, a fact which is shown by the appearance of functional paralysis of the bladder, subsequent to section of the two erector nerves, between the bladder and the spinal cord, and in spite of the integrity of the hypogastric nerves, which are branches of the great sympathetic nerve. The latter nerve, therefore, according to Guyon, plays no part in normal micturition.

**Stuff and Nonsense.**—It will interest every medical man to peruse a letter which appeared in the *Toronto Star* on the 11th of October, written by Dr. A. J. Harrington, of this city. The letter is headed, "A Doctor on Christian Science." It goes to prove in a very conclusive manner what absolutely idiotic ideas the sect called Christian Scientists entertain, and say that they believe. No one can credit that they can possibly place any confidence in Mary Baker Eddy's religion (if it is one), as the biggest numskull can but call it Rot—Tommy-rot.

**Notification of Tuberculosis.**—We notice that tuberculosis has been declared an infectious disease by the Iowa State Board of Health. They also recommend that persons afflicted with it and the infected premises be dealt with according to their published regulations. A pamphlet has been issued by this Board offering instructions and suggestions for dealing with the disease in question.

*Correspondence.* 

*The Editor cannot hold himself responsible for any views expressed in this Department.*

**BUBONIC PLAGUE.**

OTTAWA, *October 10th*, 1900.

To the Editor of THE CANADIAN JOURNAL OF MEDICINE AND SURGERY :

DEAR DOCTOR,—I beg leave to acknowledge receipt of your letter, dated 9th instant, asking answers to the following questions:

1. Is there any internal quarantine in the British Isles against Glasgow?
2. Do many Glasgow ships enter Canadian ports?
3. Are Glasgow ships entering Canadian ports detained until disinfected, the crew medically examined, and their clothing fumigated?

In reply I have to state as follows:

1. I am not aware that there is any internal quarantine in the British Isles against Glasgow.
2. A considerable number of Glasgow ships enter Canadian ports.
3. Glasgow ships entering Canadian ports are specially medically examined and, even if healthy, detained till a period of ten days from their departure from Glasgow has elapsed if the voyage has taken less than that time. This is in accordance with the rules laid down in the International Sanitary Convention, signed at Venice in 1897, and subsequently ratified at Rome.

The information we have is to the effect that the outbreak in Glasgow is of an extremely limited nature. It occurred two and a half miles away from the docks, and has been quite isolated and controlled by the local health authorities, and for these reasons it threatens only to an exceedingly limited degree, if indeed at all, vessels and persons leaving the port of Glasgow.

Special regulations have been sent to all our quarantine officers from time to time, drawing their attention to this outbreak at Glasgow and the necessity for special medical examination of vessels arriving from there.

Instructions have been issued for the placing of funnels on the hawsers and for the guarding of gangways both at Glasgow and at Canadian ports to prevent the possibility of rats passing from the docks to the ship, or *vice versa*. A supply of Haffkine's Prophylactic has been distributed to the quarantine stations, and Danysz Rat Virus is being furnished to shipping ports for the destruction or diminution of the rats about the piers.

In addition to the special inspection which is being made by the quarantine officers, the steamship companies have been requested to instruct their captains to take the temperature of their crews within twenty-four hours before arrival for the information of the quarantine officer.

These precautionary measures seem to the Minister as much as we are justified in doing under the existing conditions of things in Glasgow.

Yours truly,  
F. MONTIZAMBERT, M.D.,  
*Director General of Public Health.*

DR. BERTRAM SPENCER delivered the opening address before the Medical Faculty of Toronto University last month.

DR. ANDREW HARRINGTON has returned from his annual fall "shoot." Say! talk about stories!—they are "beauts."

GEO. A. PETERS, M.B. (Tor.), F.R.C.S. (Eng.), will in future confine his work to surgery and to consultations in surgical cases.

W. D. FERRIS, M.B. (Tor. '98), now practising at Shallow Lake, paid a flying visit to his *Alma Mater* during opening week.

DR. and MRS. NICOL and Miss Lottie Nicol, of Cooksville, are removing to the city for the winter months, and will reside on Givens Street.

DR. WEBSTER, of the Rockwood Asylum, Kingston, has been transferred to the Hamilton Asylum for the Insane, and Dr. Herriemen, of the Hamilton Asylum, to the Rockwood Asylum.

DRS. H. T. MACHELL, F. N. G. Starr, and Jas. M. MacCallum returned three weeks ago after two weeks' vacation with the wild duck of the Georgian Bay. Their friends have since been living "high."

DR. W. H. PEPLER has removed his residence to 396 College Street, the house until recently occupied by Dr. C. E. Stacey. Dr. Pepler will still retain his office at the corner of John and Adelaide streets.

TORONTO ORTHOPEDIC HOSPITAL has made such headway during recent months that it will be necessary to put up an entirely new building next year. It is proposed to erect it somewhere in the outskirts of the city.

At the time of going to press there were 115 freshmen registered in the Medical Faculty of the University of Toronto. At Trinity, the number registered up to the other day was, we are given to understand, about 50.

DR. A. HOLMES SIMPSON, of Winnipeg, has been appointed Chairman of the Manitoba Board of Health, succeeding Dr. J. J. McFadden, of Neepawa, who has been appointed medical superintendent of the Brandon Asylum.

## The Physician's Library.

### BOOK REVIEWS.

*Twentieth Century Practice.* An International Encyclopedia of Modern Medical Science by leading authorities of Europe and America. Edited by THOMAS L. STEDMAN, M.D., New York City. Twenty volumes. Vol. XX: Tuberculosis, Yellow Fever, and Miscellaneous. General Index. New York: William Wood & Co. 1900.

Among the contributors to Volume XX. of "Twentieth Century Practice" appear such names as Henry W. Berg, M.D., of New York; John T. Bowen, M.D., Boston; Thomas R. Brown, M.D., Baltimore; S. Adolph Knopf, M.D., New York; A. Jerome Lartigau, M.D., New York; Wolfred Nelson, M.D., New York; James E. Newcomb, M.D., New York; Francis Warner, M.D., London; and last, but by no means least, our friend and confrere, Dr. B. Small, of Ottawa, Ont.

The twentieth and last volume of this wonderful work is devoted largely to Tuberculosis, its bacteriology, pathology and treatment, contributed by A. Jerome Lartigau, of New York, tutor in Pathology, College of Physicians and Surgeons, Columbia University, and Associate Pathologist to Roosevelt Hospital, New York City. There is also a section upon Yellow Fever by Wolfred Nelson, of New York City, a gentleman who was for years a member of the State Board of Health at Panama, and who is recognized, therefore, as one able to speak upon such a subject as yellow fever. A short section upon Poisoning with snake venom, by Dr. Thos. R. Brown, of Baltimore, fills about forty pages, and also a chapter by Dr. James E. Newcomb, of New York, upon Diseases of the Uvula, Soft Palate and Faucial Pillars, with twenty-five pages or more by Francis Warner, of London, upon the subject of Neural and Mental Defects in Childhood, all make most interesting and instructive reading. The chapter consisting of less than twenty pages, devoted to the study of Mushroom Poisoning, from the pen of Dr. B. Small, of Ottawa, Ontario, cannot but interest everyone who looks over Volume XX. of this System. Dr. Small gives some illustrative cases of poisoning from mushrooms, all tending to show the acuteness of the symptoms which may supervene from partaking of this otherwise tasty and enjoyable viand. In almost all the cases there was marked prostration, with a condition of collapse nothing less than alarming; pulse small and weak; shallow respirations; abdominal tenderness; mild delirium, frequently within a few hours; intense retching and profuse watery stools. The treatment consisted largely of the administration of emetics, and apomorphine and atropine hypodermically. The author goes on in his article to show that the two principal poisons in mushrooms are muscarine and phallin, the former, characteristic of *amanita muscaria*, being an alkaloid, and the latter of *amanita phalloides*. The symptoms were those of gastro-intestinal irritation, in some cases leading to peritonitis, with death. It is to a proteid or nitrogenous substance called fungin, containing 3.2 to 7.2 per cent. of nitrogen that the mushroom owes its highly nutritive properties. The author states that atropine by its action upon the heart is directly antagonistic to muscarine, thus furnishing us with the physiological and most valuable antidote. Atropine paralyzes the inhibitory nerves of the heart and increases the rapidity of its action,



whercas muscarine produces a slowing and weakening of its action. The action of the other poison, phallin, is directed to the blood corpuscles, causing their destruction and setting free the hemoglobin, the result being that the serum escapes from the vessels into the various tissues and cavities, with a condition resembling that produced by cholera. We congratulate Dr. Small upon his share of the work in Volume XX. His contribution will certainly be appreciated by those who are at a loss to find elsewhere any literature upon this particular subject. In Dr. Nelson's section upon the subject of Yellow Fever, there is a most interesting account of Grosse Isle Quarantine Station on the St. Lawrence River. There are half-tones of (1) the furnace for generating sulphur dioxide on the quarantine boat; (2) the disinfecting cages in use at Grosse Isle, and (3) the disinfecting chamber at this same station, all going to prove what care is exercised at this point in our own country to prevent the spread of disease from any infected vessel proceeding inwards from the Atlantic ocean on its way to Quebec and Montreal. About three hundred pages of Volume XX. are devoted to a general index of the work, so that by reference to this, any reader can in a moment discover what volume and page to turn to for the desired information. This is a very valuable part of the System, as without it one might have to spend hours hunting for the subject in quest and then perhaps be unsuccessful.

We wish again to congratulate Dr. Stedman and his large staff of collaborators, and indeed the firm of William Wood & Co. also, upon the result of their labors in this, one of the most complete and thoroughly up-to-date Systems of medicine ever published. The "Twentieth Century Practice of Medicine" is a great credit to their ability, and will be remembered for not two or three years to come, but for the better part of the century about to ensue, as a work which has not only involved almost endless labor, but will stand unequalled for a long time.

W. A. Y.

*The Treatment of Disease by Physical Methods.* By THOMAS STRETCH DOWSE, M.D. (Abd.), F.R.C.P. (Ed.), formerly Physician Superintendent Central London Sick Asylum, etc. New York: E. B. Treat & Co. 1900.

It is very appropriately remarked by the author in his preface that the profession is gradually but surely giving greater attention to the treatment of disease by physical methods—and especially chronic disease—and in so doing are merely following lines of progress, which are so largely adopted, with good effects, by medical men in Europe. To one who has been engaged in the practice of medicine, even twenty years, it is very manifest that the foremost physicians are giving drugs a much less prominent place, if not allowing them to fall into comparative desuetude in their practice.

Many have heard in a general way of massage and other distinctively physical methods of treatment, but only a few practitioners have a thorough, scientific conception of their indications, methods of application and range of usefulness.

Under these circumstances the appearance of such a work as this is certainly timely. The title, however, is misleading, and it is difficult to know why the name given a former edition of the same work should have been changed. This edition, as the former one, consists of Lectures on Massage and Electricity in the Treatment of Disease, and with the single exception of one chapter, XIV., on the Nauheim or Schott Treatment in Disease of the Heart, of such lectures only. Other most important methods of treatment receive no attention in this work. Le Grange, in his work entitled "La Medication par l'Exercice," devotes nearly six hundred pages to a discussion of the treatment of disease by gymnastics and other forms of exercise. The medical literature of Germany and Norway contains much upon physical methods other than those set forth under the title employed by the author.

His discussion of Massage is most thorough and scientific. In this field the author is an enthusiast. He raises this much neglected method above the level of empiricism, and places it upon a physiological foundation. It is doubtful

whether for a practical work he has not gone too far into the discussion of Physics and Physiology.

In adopting Schreiber's summing up of the physiological effect of massage and mechanico-therapy, he gives the reader a bird's-eye view of the wide field covered by these methods of treatment (p. 28).

The author's enthusiasm has induced him to make some very strong claims for massage, and one's faith is put to a severe test (p. 93) when he says that "cases of progressive muscular atrophy which had been given up as hopeless, have been cured by massage under my own daily observation."

The careful perusal of this work must remind every practitioner of the vast amount of useful knowledge which has not come to the recent graduate of any medical college. The author does not think that massage should be left entirely to nurses or masseurs, but should be given by the physician. There is no question that some of the time which is now devoted to the study of pharmacology and materia medica might be profitably given to the acquisition of a knowledge of means more scientific, more practically useful and more agreeable than drugs. It is time that our medical colleges should make an advance step by giving their students an opportunity to know something of rational methods of treatment which now come to their attention only when they have settled in practice, and by accident learn that in massage and other physical methods are found rational and effective means for improving the health of their patients.

The work is a valuable one, and should be read by every practitioner who is desirous of being abreast of the times.

B. E. M.

*The Student's Medical Dictionary*, including all the words and phrases generally used in medicine, with their proper pronunciation and definition, based upon recent medical literature. By GEO. M. GOULD, A.M., M.D., author of "An Illustrated Dictionary of Medicine, Biology and Allied Sciences"; Editor *Philadelphia Medical Journal*, etc., etc. With elaborate tables of the bacilli, micrococci, leucomains, ptomains, etc.; of the arteries, ganglia, muscles and nerves; of weights and measures; analyses of the waters of the mineral springs of the United States, etc., etc., and a new table of eponymic terms and tests. Eleventh edition, enlarged, with many illustrations. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1900. Price \$2.50.

The eleventh edition of Dr. Gould's "Student's Medical Dictionary" is a distinct advance upon the last published but a few years ago. The author has revised the book in a manner which will be at once appreciated by the reader, be he a student or practitioner of medicine. The book is larger by about one hundred pages, and is illustrated quite freely, rendering it more valuable, especially to the undergraduate. The new table of clinical eponymic terms, symptoms, tests, etc., is in itself worth the purchase price of the dictionary, and will be a boon to all, it not being by any means an easy matter to find, perhaps in a hurry, what is meant by, say; Abernethy's fascia, Alcock's canal, Bamberger's bulbar pulse, Beigel's disease, Eitelberg's test, Levoret's law, Skene's glands, and similar terms. There are, indeed, few books, no matter how recent, that contain such information as this. Appendix "A," which gives the analyses of the various mineral springs of the United States will be found very useful to many. Dr. Gould divides this department into (1) Diuretic waters, (2) Iron waters, (3) Carbonic acid waters (4) Purgative waters, (5) Alkaline waters, (6) Saline waters, (7) Calcareous waters, (8) Sulphuretted and Hot springs, (9) Unanalyzed thermal springs. Such an appendix to a dictionary of medicine renders the work valuable, as many a time a physician, unacquainted with the analytical properties of certain waters, would be glad to be able to obtain the desired knowledge. We hardly agree with the author as to his right to call his work a student's dictionary. It is so replete with information that we feel there are few doctors who would not be pleased to be able to turn to its pages for facts concerning almost every subject medical.

W. A. Y.

*The Garden of Eden.* By BLANCHE WILLIS HOWARD, author of "One Summer," "Guenn," "Dionysius," "The Weaver's Heart's Desire," etc., etc. Toronto: The Copey, Clark Co., Limited, 1900.

When the author selected the title of this book, I imagine she had "traditional Eden" in her mind's eye, where Adam and Eve sat in happy contentment while leopard and lamb lay in peace at their feet. True love seems to be the "Queen Sovereign" in all her ideas of real Eden—love which so many have tried to describe, and to which every human being gives a different definition.

Krafft Ebing, in my mind, gives the best idea of true love, which he says rests only upon a recognition of the social qualities of the beloved person—love which is willing not only to enjoy present pleasures, but to bear suffering for the beloved object, and sacrifice all. The love of a strongly constituted man shrinks before no difficulties or dangers in order to gain and keep possession of its object. As to woman, he says, she loves with her whole soul. To her love is life; to a man it is the joy of life. To him misfortune in love is a wound, to her, it costs her life, or at least her happiness.

A psychological question worthy of consideration is, whether a woman can truly love twice in her life. In the conversation between Monica Randolph and her mother, Monica replies, "Then the world is wrong, not me. It cannot be a sin to love what is lovable wherever one finds it;" and at another part she says, "Never while I live can I condemn any woman for anything she may do for love's sake."

Monica Randolph is the heroine in this story, and her remarks, no doubt, are in direct opposition to the conventionalities of the present day; but in my opinion cannot but do good, and it would be far better if more viewed matters in this very same manner. Listen to another remark: "But what is in my soul for him that is good, that is innocent, I would go to the stake for it. The world may judge as it will. I will never call it a sin. God who sent it knows it is no sin, but good—good to the core."

Dr. Arenburg, one of the leading characters of this work, is a physician and surgeon of the older type of practitioner, who is equally at ease with the most difficult surgical operation, and the most malignant type of diphtheria, whose whole soul is enveloped in his work, sooner visiting the poor and needy than the rich, caring nothing for social status, but full of philanthropic enthusiasm in his practice. In fact, Dr. Arenburg is one of the most delightfully described characters one could wish to read of. The story is told in a most scholarly fashion, and will undoubtedly be read with much pleasure by the "story-loving folk."

A. J. H.

*Hernia: Its Etiology, Symptoms and Treatment.* By W. McADAM ECCLES, M.S. (Lond.), F.R.C.S. (Eng.), Assistant Surgeon West London Hospital, and City of London Truss Society; Examiner in Anatomy to the Society of Apothecaries, and late Demonstrator of Operative Surgery, and Senior Assistant Demonstrator of Anatomy St. Bartholomew's Hospital, etc. Pp. 231. With 97 illustrations. London: Bailliere, Tindall & Cox, 20 and 21 King William Street, Strand. 1900.

The chief feature which commends this book is the excellent series of illustrations, constituting a sort of clinical atlas of Hernia. These are reproduced from photographs, and they illustrate very completely the different forms of hernia met with in the male. The author has devoted a considerable amount of space to that important subject of the treatment of hernia by trusses. He condemns the use of the Berlin wool truss in infants as unreliable in preventing the descent of the hernia; the steel spring truss is the one which receives his approval. We are surprised, however, that he does not advocate the form of spring truss which crosses the middle line anteriorly before terminating in the pad which is to support the hernia in the inguinal region of the opposite side. This form of truss in cases of single inguinal hernia in the adult is certainly the best, is more comfortable, is more readily retained in position,

and is altogether built on more perfect mechanical principles than the form of truss which does not cross the middle line.

Mr. Eccles' method of radical cure in inguinal hernia presents no features worthy of special note : it consists in removal of the sac, and simple suture of the inguinal canal. In congenital herniæ in boys, where the parts have not been allowed to become much dilated by the protrusion of the viscera, the author considers that there is no need, as a rule, to pass any suture to diminish the size of the inguinal canal. The methods of radical cure, as performed by Halsted, Bassini, MacEwen, and Kocher, are referred to, but not in sufficient detail to be of any value as a guide to the operating surgeon. The work is a short epitome of the subject, and contains many valuable, practical suggestions in the treatment of hernia. The illustrations are well executed, and are reproduced with the letter-press on unusually good paper.

A. P.

*A Text-Book of the Diseases of Women.* By HENRY J. GARRIGUES, A.M., M.D., Gynecologist to St. Mark's Hospital, in New York City ; Gynecologist to the German Dispensary in the City of New York ; Consulting Obstetric Surgeon to the New York Maternity Hospital ; Consulting Physician to the New York Mothers' Home and Maternity Hospital, etc., etc., etc., with 367 illustrations. Third edition, thoroughly revised. Philadelphia : W. B. Saunders & Co. 1900. Canadian Agents : J. A. Carveth & Co., Toronto. Price, \$4.50 in cloth, \$5.50 in sheep or half morocco.

For any author to have to publish his book three consecutive times in about six years, each time necessitating not a slight, but almost entire, revision, goes at least to show that his labors have been thoroughly appreciated by his conferees. Such a lot has fallen upon Dr. H. J. Garrigues, who has had to publish a second and a third edition of his now well-known book upon "Diseases of Women." It is a fact that in but few colleges of medicine there is a sufficient amount of attention paid to the teaching of diseases of women and gynecology. Students at the termination of their course of study leave college to commence the practice of medicine with but a smattering of practical knowledge on this subject, and it is only a short time before they are "up against it," and are face to face with a case which baffles them completely. Many, after a few years of practice, have recourse to a post-graduate institution where they try to master the treatment of the commoner diseases of women, and frequently are greatly assisted in their work thereby. After going carefully over the latest edition of Garrigues' book, we have come to the conclusion that, containing, as it does, the most recent information and up-to-date knowledge upon diseases of women as a whole, it will certainly take the place very largely of the post-graduate course of study referred to, and any man who wishes to get a thorough knowledge of this subject, presented in a concise and attractive manner, will do so by a careful perusal of the book in question, and will thereby help to equip himself for a successful line of work. The author has given, not all, but the best method of treatment, and each chapter is clear and succinct. The book is eminently practical, but limited space being devoted (and that wisely) to pathology, the anatomy of the female generative organs, etc. There are separate chapters devoted to Leucorrhœa and Hemorrhage, both interesting and instructive. The book is a good one, and should be purchased.

*A Treatise on Diseases of the Nose and Throat.* By ERNEST L. SHURLY, M.D., Professor of Laryngology and Clinical Medicine, Detroit College of Medicine ; Laryngologist and late Chief of Staff, Harper Hospital, etc. New York : D. Appleton & Co. 1900. Canadian Agents : The Geo. Morang Co., Ltd.

Unlike most medical books, the basis of arrangement of this work is pathological and not anatomical. The neuroses of the nose are treated of in the same chapter as those of the larynx. This arrangement certainly lends itself to conciseness and completeness.

It is now some years since Dr. Shurly, along with Honeage Gibbes, published their views as to the causation and treatment of tuberculosis. It is then with some interest that one finds that Dr. Shurly still holds that "Iodine when

conjoined with some proteid substance furnishes the best results, so far as specific medication is concerned." He believes that the *role* of the tubercle bacillus in spreading disease has been overestimated, and that the independent powers ascribed to it have also been exaggerated. As to the influence of heredity he remarks: "Modern writers, while acknowledging this factor, are nevertheless prone to minimize it too much by using the term 'susceptibility.'"

Conservative as are the views expressed upon tuberculosis, the author gives no uncertain sound as to the value of antitoxin in diphtheria, declaring that "with this plan of treatment, the dread disease is robbed of at least one-half its virulence." One is pleased to see a special section of the chapter on Diphtheria, devoted to "mixed infection." The description of intubation of the larynx is noteworthy for its illustrations, mesial sections showing the various steps in the introduction and removal of the tube, and the various difficulties which may arise.

The galvano cautey seems to be a favorite weapon in Dr. Shurly's armamentarium, but he devotes some pages to the harmful results occasionally met with from it. The local treatment is, in his opinion, the *sine qua non* in chronic rhinitis, but one short paragraph of six lines being given to general treatment. Among the many publications on this subject, we predict that this will more than hold its own.

J. M. M.

*Bacteriology and Surgical Technique for Nurses.* By EMILY M. A. STONEY, Superintendent of the Training School for Nurses, St. Anthony's Hospital, Rock Island, Ill.; author of "Practical Points in Nursing," "Practical Materia Medica for Nurses," etc. Illustrated. Philadelphia: W. B. Saunders & Co. 1900. Canadian Agents: J. A. Carveth & Co., Toronto, Ont. Price \$1.25 net.

As the author remarks, "This book constitutes the notes of a series of lectures on bacteriology and surgical technic." The first part of the book is devoted to Bacteriology and Antiseptics; the second part to Surgical Technic, Signs of Death, Autopsies. These subjects are not treated of in what might be called an exhaustive manner; but in such a fashion as to make them clear and intelligible to nurses, or it may be to other educated persons. We have looked through several of the chapters of the volume, and think that the author has accomplished her task in a satisfactory manner. Certainly, a nurse, trained to do her work in the manner described, would be a most useful assistant to the surgeon. In private practice, the conveniences required by the surgeon are frequently lacking, but it is surprising how the intelligent utilization of makeshifts can yield excellent results, even in the houses of the poor. Probably one of the most useful chapters in the volume is the sixteenth, in which the nursing of operative cases in private practice is described. Chapter XVIII., on Signs of Death and Autopsies, is well written. The nurse is advised to do all in her power to assist the physician or surgeon to obtain autopsies, and the remark is made that "with a little tact the necessary permission can be usually obtained." The volume is well printed, the illustrations are artistic and helpful.

J. J. C.

*A Treatise on Mental Diseases*, based upon the Lecture course at the Johns Hopkins University, 1899, and designed for the use of Practitioners and Students of Medicine. By HENRY J. BERKLEY, M.D., Clinical Professor of Psychiatry, Johns Hopkins University: Chief Visiting Physician to the City Insane Asylum, Baltimore. With frontispiece, lithographic plates, and illustrations in the text. New York: D. Appleton & Co. 1900. Canadian Agents: The Geo. Morang Co., Limited, Toronto.

There is almost a dearth of books devoted to a consideration of Diseases of the Mind, and written in such a concise form as to be acceptable reading to the average busy practitioner, whose time for literature, even medical, is far too limited. After reading part of Dr. Berkley's book, and looking through the whole of it, it is self-evident that he has succeeded in compiling a work which

will undoubtedly be a most valuable one, its advantage over, what might be termed, its competitors in the field being that the book under consideration is written in a manner which appeals to the ordinary every-day practitioner of medicine, and not necessarily to the alienist alone. Dr. Berkley has divided his book into three parts, the first dealing with the Anatomy and Histology of the Central Nervous System; the second, with General Pathology, and the third with Clinical Forms of Mental Diseases. Under the heading "Special Forms of Insanity," the author arranges five groups: Group No. 1 treats of Idiopathic Insanities, *e.g.*, insanities without ascertainable alteration of the brain substance. Group 2 treats of Insanities Consecutive to Organic Lesions of the Cerebral Substance. Group 3 takes up Insanities of the Psychological Degenerate. Group 4 deals with States of Arrested Psychological Development, *e.g.*, Idiocy, Cretinism, Imbecility, etc., and Group 5 refers to the Psychoses of Childhood. The fifty-seven illustrations are works of a master, and enhance the value of any book, especially one dealing with a subject that is somewhat obtuse to the average student of Æsculapius, to a very creditable extent. We recommend Dr. Berkley's work as one well worthy of possession.

W. A. Y.

*A Book of Detachable Diet Lists.* For Albuminuria, Anemia and Debility, Constipation, Diabetes, Diarrhea, Dyspepsia, Fevers, Gout or Uric Acid Diathesis, Obesity, Tuberculosis, and a Sick-room Dietary. Compiled by JEROME B. THOMAS, JUN., A.B., M.D., Instructor in Materia Medica, Long Island College Hospital; Assistant Bacteriologist to Hoagland Laboratory. This is the second edition revised. Philadelphia: W. B. Saunders & Co. Canadian Agents: J. A. Carveth & Co., Toronto. Price \$1.25 net.

These diet lists are very handy for the busy practitioner, and as strictness in diet is such a powerful factor in the management of disease, it is always well for a nurse to know just what the physician will allow, and what must be withheld. She has her printed list, which the attending physician has given her, and upon which he may write any extra orders, and goes accordingly by it. The Sick-room Dietary is exceedingly useful, and tells exactly how and in what proportion different articles of diet such as peptonized milk, koumiss, junket, whey, etc., is made. I think it would be a great improvement if these lists were made half the size, so that a physician could carry them in his pocket, thus making them much more handy. The size of the present lists is quite suitable for use in the office.

A. J. H.

*An American Text-book of Physiology.* By Henry P. Bowditch, M.D., John G. Curtis, M.D., Henry H. Donaldson, Ph.D., W. H. Howell, Ph.D., M.D., Frederick S. Lee, Ph.D., Warren P. Lombard, M.D., Graham Lusk, Ph.D., F.R.S. (Edin.), W. T. Porter, M.D., Edward T. Reichert, M.D., Henry Sewall, Ph.D., M.D. Edited by Wm. H. Howell, Ph.D., M.D., Professor of Physiology in the Johns Hopkins University, Baltimore, Md. Second edition, revised. Philadelphia: W. B. Saunders & Co. 1900. \$3. Canadian Agency: J. A. Carveth & Co., Toronto.

The authors are to be congratulated on the success of "The American Text-book of Physiology." The literature on this subject has become so voluminous in recent years that it is almost impossible for any one person to keep thoroughly informed on all topics. The plan by which the work of preparing the article on each subject is undertaken by a man specially conversant with that particular branch of the science, is well adapted to the treatment of physiology, and in this case has been a pronounced success.

The publishers have altered the form of the second edition and improved it greatly by issuing it in two volumes. "The actual amount of material in the book remains the same as in the first edition, although, naturally, very many changes have been made. Even in the short time that has elapsed since the appearance of the first edition there has been much progress in physiology, as the result of constant activity in this and the related sciences in all parts of the

world, and an effort has been made by the various contributors to keep pace with this progress. Statements and theories that have been shown to be wrong or improbable have been eliminated, and the new facts discovered, and the newer points of view have been incorporated so far as possible."

"The American Text-book" is one of the best works on physiology in our language. We are sure the success of the second edition will be even greater than that of the first.

A. E.

*A Manual of Syphilis and the Venereal Diseases.* By JAMES NEVINS HYDE, A.M., M.D., Professor of Skin, Genito-Urinary and Venereal Diseases, Rush Medical College, Chicago; Dermatologist to the Presbyterian, Michael Reese and Augustana Hospitals of Chicago; Consulting Dermatologist to the Chicago Hospital for Women and Children, and to the Chicago Orphan Asylum; and FRANK HUGH MONTGOMERY, M.D., Associate Professor of Skin, Genito-Urinary and Venereal Diseases, Rush Medical College, Chicago; Professor of Skin and Venereal Diseases, Chicago Clinical School; Dermatologist to the St. Elizabeth's Hospital, Chicago. Second edition, revised and enlarged, with fifty-eight illustrations in the text and nineteen full-page lithographic plates. Philadelphia: W. B. Saunders & Co. Canadian Agents, J. A. Carveth & Co., Toronto, Ont. Price, \$4.00, net. 1900.

The names of Hyde and Montgomery have for some years now been closely associated with their special work on Skin and Venereal Diseases, and to-day their book upon the subject is looked upon as an undoubted authority, and one which can be consulted with confidence. It is only a short time since Volume I. appeared from the press, but so large a run was there upon it that the authors wisely decided to issue a second edition. The result of their labor is a book almost entirely rewritten, larger than the first, and containing a fund of information upon all the principal skin and venereal diseases, with their most recent methods of treatment. The section devoted to Gonorrhoea has not only been revised but written afresh, and the reader does not take long to recognize therein that the author is thoroughly up-to-date in his views, and has not depended to any extent upon those of any other writer upon the subject. We are glad that the book contains so many illustrations, as its value is thereby greatly enhanced. Hyde and Montgomery's "Manual of Syphilis and the Venereal Diseases" is practical in every sense of the word, and ought to be purchased by every medical man who desires to have on his shelves the most recent information upon this branch of medicine.

*Surgical Anatomy.* By JOHN B. DEEVER, M.D., Philadelphia, in three volumes. Vol. II., Neck, Mouth, Pharynx, Larynx, Nose, Orbit, Eyeball, Organ of Hearing, Brain, Male and Female Perineums. Philadelphia: P. Blakiston's Son & Co. 1900.

To those who have subscribed for Deever's "Surgical Anatomy" we must offer our congratulations. Vol. II. is before us, and is quite up to, if not ahead of, Vol. I., a review of which appeared in this journal some months ago.

The plates illustrating surface marking are very useful, in fact all through it will be difficult for an author to surpass the work on the various plates.

Then in the text surgical ideas are so cleverly intermixed with the purely descriptive part that one is almost tempted to forget he is reading anatomy.

The diagrams representing collateral circulation are very instructive, and at a glance give one information that hours of reading will hardly impress upon one's memory. The lymphatic distribution is carefully gone into. Following upon an elaborate description of the brain is an account of the various fractures of the skull. The illustrations of the male and the female perineums will give the student a correct idea of the position and relations of the surface anatomy, whereas in most text-books the student is led—from diagrams—to an erroneous conception to begin with, and spends many weary weeks in "unlearning" what should never have been taught. Following upon a description of the perineum, there is an account of the diseases and injuries to which this unhappy region is heir.

F. N. G. S.

[PUBLISHER'S DEPARTMENT.]

**MEDICINE AND PHARMACY TWIN SISTERS.**

In the practice of medicine, as in every other department of human effort, whether scientific, commercial or technical, the pace has become extremely swift and competition equally fierce. To meet existing conditions the times demand that the physician shall thoroughly prepare himself for his professional career, and as a practitioner keep abreast of the tide of medical progress.

While the manufacturing pharmacist can hope to exert but little influence upon the medical man during his evolutionary or undergraduate period, there is no doubt but that he has much to do in shaping the destiny of the same individual after he has once become identified with the aims and interests of his chosen profession.

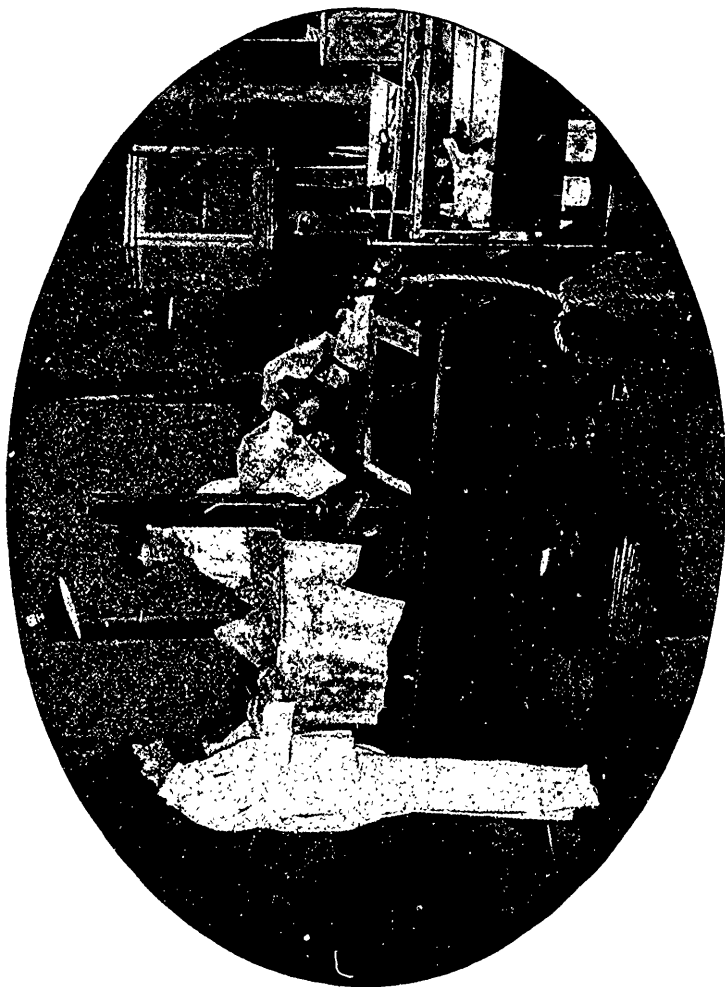
If the physician in his clinical work is ever to attain to a degree of accuracy commensurate with the brilliant and positive results of the surgeon, it is essential that the pharmaceutical preparations which he employs be not only pure, but of a high standard of efficiency. Furthermore, it is equally important that they should be absolutely invariable in their physiologic and therapeutic effects.

The aim of the scientific manufacturing pharmacist is to produce pure standardized medicaments of the finest quality. His energies are directed not alone toward the development and perfection of technical processes, the attainment of higher standards of excellence in finished preparations, or the further extension of a vast commercial system; he also has another mission to perform. He must be a scientific investigator as well as a manufacturer of fine pharmaceuticals.

It has been the privilege of the writer to visit the great establishment of Messrs. Parke, Davis & Co., who maintain large and thoroughly equipped laboratories in Detroit, Walkerville and London, in which original work is carried on by corps of experts in analytical chemistry, pharmacy, pharmacology, bacteriology, physiology, and other departments of science bearing a relationship to medicine. Through their agency, new remedies are brought to light and unrecognized properties of old remedies or better combinations of well-known drugs are discovered and made practicable. Improved methods of drug administration are devised, and inert, useless or toxic substances are eliminated from otherwise valuable medicaments. The elaboration of the principles of serum therapy, by a more general application of which the twentieth-century physician will assuredly control epidemic diseases, is also the subject of constant study and experiment.



The great analytical department, like a sleepless sentinel, virtually stands guard over the gateway of these laboratories. It rigidly tests specimens of all drugs and chemicals before they are accepted and placed in storage. Inferior drugs and impure chemi-



Collecting the vaccine in the Biological Department of Park, Davis & Co.'s Laboratory.

cals can never gain entrance here, as only the best are wanted and only the best and purest are accepted and permitted to pass the threshold. As a further precaution, every specimen of crude drug from the vegetable kingdom, submitted for purchase, is examined

by a trained botanist to determine its identity and the commercial grade to which it belongs. Even if botanically correct, a crude drug of inferior grade is never accepted by this house under any consideration.

In this connection it may interest the reader to learn that, although their herbarium of 30,000 specimens represents practically all the medical plants known, Parke, Davis & Co. are adding to it from time to time by exchange of specimens with botanists and botanical gardens throughout the world. Their aim is to increase the number of genera rather than the number of species of genera already represented, in order to enhance the real scientific value of the collection. Some idea may be had of the important service which their botanical expert is called upon to render when we state that he is in almost daily receipt of specimens for identification from physicians and pharmacists in all sections of the country.

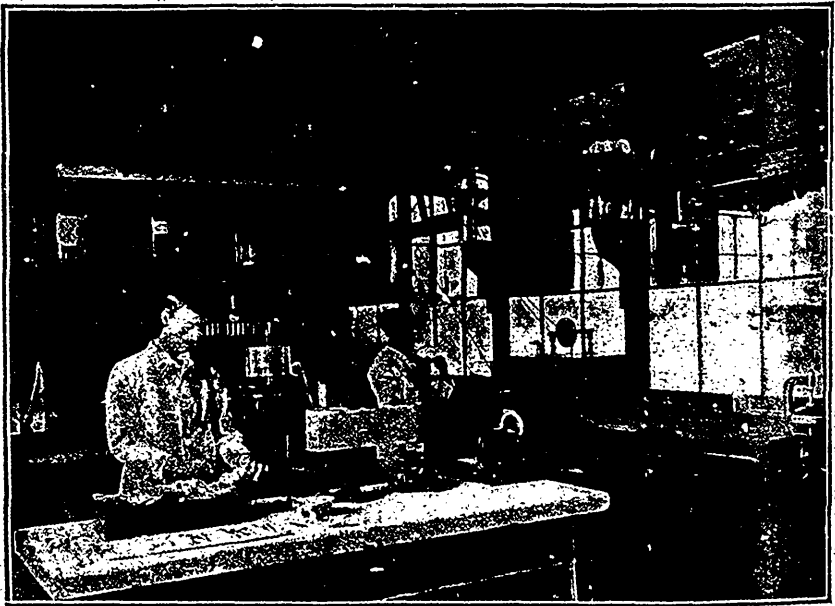
The analytical department is thoroughly equipped with a profusion of imported and domestic apparatus, much of which is designed for work peculiar to this establishment. Instruments of precision, as the spectroscope, the polariscope and the microscope, are in daily use. Delicate chemical balances, combustion furnaces, centrifugal machines, vacuum pans, dialysers, and other forms of working apparatus are plentifully supplied and in constant operation. Special appliances, such as the Kramer mercury pump, an elaborate apparatus for testing pepsin, designed by the chief chemist, automatic shaking machines, apparatus for rapid evaporation, a hydraulic press, water and electric motors constitute only a part of the extensive equipment of this department. In determining the alkaloidal strength of drugs, improved methods of assay are used, which are the fruit of long years of experience. The analytical department also examines critically each finished product of the laboratories and adjusts its strength to the pharmacopœial standard. In those instances in which no standard of strength is established by the pharmacopœia, finished preparations are made to conform to the fixed standards of the firm.

In the department of experimental pharmacy experts are diligently engaged in original investigations looking toward improvements in pharmaceutical methods, devising new formulæ, or working out new processes for the manufacture of alkaloids and chemicals on a commercial scale. The chemical library attached to this department contains works of reference and periodicals in the English, German and French languages, and is in constant use.

In the domain of bacteriology volumes of useful knowledge have been accumulated since Koch heralded his discovery of the bacillus tuberculosis, in 1882. Not only has bacteriology enlightened us upon the subject of the etiology of many deadly contagious diseases, but its devotees have set about to devise the means for their prevention and cure.



A view of Parke, Davis & Co.'s bulk stock room of fluid extracts, representing a portion of their physiologically tested and chemically assayed fluids.



View of operation in Pharmacological Department of Parke, Davis & Co.'s Laboratory.

Recognizing the opportunity for original research in this field, Parke, Davis & Co. established their biological department several years ago. In this department they were among the very first American investigators to take up the subject of serum therapy. Antidiphtheritic Serum was placed in the hands of the medical profession, and at once bounded into favor as a specific in the treatment of the most dreadful disease of childhood. Antistreptococcic Serum followed; and although its success for a time seemed to depend very largely upon a careful selection of suitable cases, of late the reports of its action are more favorable than ever, owing unquestionably to certain improvements in the methods of producing immunity, which render it possible to obtain sera of higher potency.

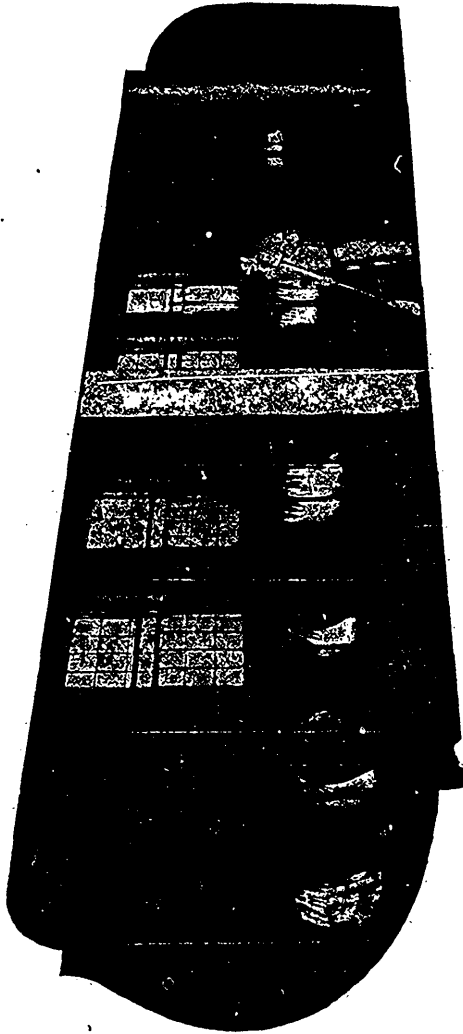
Antistreptococcic Serum has given eminently satisfactory results in many reported cases of puerperal fever and other forms of septicemia, in erysipelas, and in the mixed infections of diphtheria, scarlatina, and tuberculosis. Antitetanic Serum is being successfully employed as an immunizing agent in veterinary practice, and to some extent in general medicine. Reports from reliable sources indicate that its use as a prophylactic in all cases of suspected injuries is perfectly justifiable.

Within a comparatively recent period the medical profession of this country and England began to realize the urgent need of improvement in the universal methods of producing vaccine virus. Parke, Davis & Co. took up the subject in their biological department and wrought out Aseptic Vaccine, a perfectly pure, sterile, glycerinated virus. Since the days of Edward Jenner no such improvement in vaccine methods has been recorded. With the advent of Aseptic Vaccine the usual complications and sequelæ of *quondam* methods no longer constitute an essential feature of the clinical history of vaccination. This house also markets vaccine points of a superior grade, which are supplied to physicians who prefer that method to the more recent process.

The rapid advancement and the growing importance of preventive medicine furnish Parke, Davis & Co.'s experts the incentive to enter upon an exhaustive study of certain fatal diseases epidemic among animals, with the ultimate purpose of discovering reliable prophylactic remedies. Black-leg vaccine is a notable example of what they have accomplished in this direction and of what may be accomplished in the future. Its efficiency in protecting cattle from the ravages of an exceedingly and rapidly fatal disease has been demonstrated beyond peradventure, inspiring the hope that ere long the physician may possess equally effective means of defence against cholera, yellow fever, plague, cancer, tuberculosis, and similar scourges.

Among the latest products of the biological department of the firm mention should be made of a new virus for the prevention

of splenic fever or anthrax in cattle; its efficacy has been satisfactorily demonstrated, and it is now ready to be sent forth upon its humane mission. Antitubercle Serum and Tuberculin are still in demand; the latter is used chiefly in veterinary practice,



One row of Inoculated Heifers in Vaccine Propagating Room of Parké, Davis & Co.'s Biological Laboratory.

although of late reports have appeared of its tentative employment in general medicine as a diagnostic test for incipient phthisis. Microscopic slides of all important pathogenic bacteria and many of the well-known saprophytes are carefully prepared here, and

accurately classified. Parke, Davis and Co.'s microscopic slides are in general use by instructors in schools and colleges throughout the country; they also supply culture media of any kind on demand. Their biological department has recently solved the problem of the permanent preservation of suprarenal extract, a matter of considerable importance to the ophthalmologist and laryngologist, and has succeeded in producing a stable solution or extract which possesses every therapeutic characteristic of the fresh solution.

Experimental work is now being carried on in this department with a view to the elaboration of other sera, vaccines, and various biologic products, of which announcement will be made from time to time. The huge twin stables in which thousands of animals are housed are the objects of much interest on the part of visitors. They are the largest and most completely equipped buildings devoted exclusively to bacteriological work in the world.



Finished bulb and carton container of Parke, Davis & Co.'s anti-diphtheritic serum ready for the market.

The standardization of important drugs is a subject that has long been of intrinsic interest to this firm. The pharmacist is cognizant of the fact that no two specimens of crude drug will yield finished extracts of uniform strength. The only way, therefore, to attain uniformity in the action of such preparations is to make them conform to a predetermined standard of strength. For many years Parke, Davis & Co. have used accurate methods for assaying chemically all powerful drugs amenable to that form of treatment. Drugs that cannot be standardized chemically, such as ergot, digitalis, convallaria, strophanthus, squill, aconite, Indian cannabis, and others, are tested in their biological laboratories upon animals, and variations in physiological effects are noted and corrected. The objection has been raised to physiological standardization that only relative values can be thus determined. As a result of long experience in this work, methods of

physiological assay have become so accurate that it is now possible to determine with precision how strong a given fluid extract may be. The physician can depend upon it that a definite dose of one of Parke, Davis & Co.'s physiologically standardized preparations will always yield a definite result.

It would be inappropriate to enter upon a lengthy discussion of the scientific features of the work of this firm in a paper of this kind. Much information of interest may be gleaned from their literature on the various biological products, and on physiological standardization. These publications are cheerfully supplied, postage free, to any physician who will indicate his desire to receive them. Suffice it to say, it shall always be, as it has always been, the aim of this house to hold an advanced position in scientific pharmacy, not only as manufacturers, but also as original investigators and seekers after new and better methods.

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DR. SAYRES' will dispose of an estate of \$50,000 in real and \$3,430 in personal property.

THE Baltimore University opened October 1st, with an address by Prof. J. A. Melvin on "Medical Folk-lore."

AN honored contemporary devotes space in its editorial columns to the subject, "Shirt Waists for Men"!!

THE department of Dr. J. J. Mackenzie, Professor of Pathology in the medical department of Toronto University, is being equipped to the extent of \$4,000.

THE Pan-American Exhibition has authorized an exhibit of sanitary methods and appliances adopted or in use throughout the Western Hemisphere by Health Boards. It will cover methods of procedure in all matters pertaining to sanitation, and an exhibit of appliances and models of plants in use for disinfection, ventilation, heating, water-supply, garbage and sewage disposal, etc.—*Phila. Med. Jour.*

THE executive of the Ontario Consumptive Association have prepared an application to the Toronto City Council for \$50,000 for a consumptive sanatorium, to be authorized by the people at the municipal elections in January next. The association will undertake to raise \$30,000 by subscription, the city will then provide the \$50,000 which, with the offer of the transfer of the National Association of \$20,000, will make \$100,000, the amount necessary to erect and maintain an institution of 100 beds at first. A site about nine miles from the city has been selected.