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THE
MONTREAL MEDICAL JOURNAL.

VOL. XXXVII. APRIL, 1908. No. 4.

THE ORIGIN OF THE BLOOD CELLS: A REVIEW OF THE LITERATURE.

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In discussing the embryological and post-natal origin of the blood cells we are confronted with a question, which, although the literature is most extensive, leads us as yet to no absolute conclusion. Nevertheless, there have been many observations recorded which have determined greater and lesser points on the subject, but whose interpretation is not universally accepted in the same light. In collating the literature of this subject, I have been forced to disregard the comparative investigations on the development of the blood on account of the extensive writings thereon.

Red blood cells.—The question of the origin of the blood forces us to distinguish between the primary and secondary blood-forming sites,—that is, between the sites of earliest development of blood cells in the embryo and those locations existing in post-natal life. It is now accepted that the blood cells arise from the mesoderm. At a very early period in the embryo, and long before the heart has commenced to beat, there are developed outside of the embryo, in the area vasculosa, scattered clusters of nucleated cells which early develop the hæmoglobin colour. At first these vessels are laid down as solid strands of cells, which later become hollowed out, and anastomose with other nearby capillary tubes. In these tubes are to be found clusters of cells presenting the hæmoglobin colour, which are still attached to the endothelial walls. Before the heart begins beating, and before the vessels become linked to one another, these tinted cells lie free in a fluid within the vascular tubes. It has been noted that the vasoformative cells show a rapid division of their nuclei without a corresponding division of the protoplasm. Each one of the new nuclei then acquires

a certain amount of cytoplasm about it, so that the mother cell is now represented by a cluster of hæmoglobin containing daughter-cells. These masses of cells have been spoken of as blood islands. As the stages of the development of these early blood cells can be definitely traced from the endothelial lining of the primary vessels there appears little doubt that the early nucleated red blood cells are specialized descendants of endothelial cells. To this view Goette is a strong opponent; he believes that the blood cell has its origin in the yolk, while the endothelial cells arise from mesoderm.

The secondary vascular areas develop within the embryo, and give rise to blood cells from their endothelial lining, in a manner similar to that noted in the extra-embryonic vascular zone. Schaeffer has noted the development of blood corpuscles from the connective tissue cells of the new-born rat. These corpuscles can be distinguished by their decided reddish tinge, while in some the red matter is condensed in the form of globules varying in size from tiny specks to spheroids having the diameter of the blood cell. The connective tissue cells become vacuolated and the blood cells gradually accumulate within the vacuole, until a cavity is formed within the cell, which later communicates with similar spaces in other cells. In this way a capillary network with blood cells within it is developed.

The primitive form of the red blood cell is probably spherical or spheroidal, and the characteristic shape is not assumed until later. In the early stage of development the protoplasm of these cells enlarges for several days, while at the same time there is a progressive diminution in the size of the nucleus. Three types of the red cells can be distinguished during their development: 1, Young cells with very little protoplasm; 2, old cells with much protoplasm and granular nuclei; 3, cells with shrunken nuclei which stain darkly.

Multiplication of the red blood cells by division has been recorded by Remak, Bizzozero and others. The division is indirect and takes place by the formation of nuclear spindles. These divisions occur abundantly in the blood of the chick of 3 to 5 days, and it is safe to assume that the same process is typical for all vertebrates. The number of the red cells is further increased by additions arising directly from the primary vascular areas. The nucleated red cells form the permanent red blood corpuscles in all the vertebrates except the mammals. In mammals, they disappear in embryonic life, or soon after birth. How these cells disappear is not known, though some authors have maintained that they are transformed into the non-nucleated variety.

The blood for a certain time, in embryonic life, is found to contain only the red cells, most of which are nucleated, the leucocytes appear later. In adult life nucleated red cells are normally found only in the blood-forming organs, mainly the bone marrow.

All authors are by no means agreed upon the mode of origin of the non-nucleated red cells in mammals. Schaeffer traces them to differentiation of the protoplasm of the vaso-formative cells. This view correlates the animal blood globules with the plastids of the botanists. Against this view is the contention of Kölliker, that the red globules are derived from nucleated corpuscles which have lost their nuclei. Sanfelice regards the red cells as being derivatives of leucocytes. The white cells are supposed to shrink, lose their nuclei and become charged with hæmoglobin. Still another view is brought forward that the bone marrow produces non-nucleated red corpuscles from certain of its cells.

There seems little doubt that some of the first non-nucleated red cells arise in the vasoformative cells in different parts of the embryo. These cells acquire a reddish tinge, and after a time the substance becomes condensed in the form of globules within the cells and gradually assumes the size and shape of a red blood corpuscle. Some areas of embryonic connective tissue show such cells studded with these globules and forming nests of blood corpuscles or blood islands. The development of the non-nucleated red cells in this manner simulates very much the origin of the nucleated red corpuscles in the early embryo. There is only this difference, that in the intracellular origin of the red cells the nucleus of the mother cells seems to play no part, at least not through mitosis. It may be the nucleus does play a part in contributing hæmoglobin to the developing daughter-cells (Hayem). The intracellular development of red blood corpuscles ceases before birth, although in some animals it may be continued for a few days after birth. Subsequently, therefore, it becomes necessary to seek for some other source of origin of the red blood discs during the remainder of life. As soon as the vessels are definitely found in the embryo, and the vasoformative cells are no longer so active, new sites of blood forming organs develop.

Others have asserted that the lymph glands, and more particularly the thymus give rise to red corpuscles by a metamorphosis of their lymphocytic cells, (Malassez).

Very early in embryonic life the liver, as was pointed out by Kölliker, Neumann and others, becomes a principal seat of blood formation. It has been noted that certain cells, presumably of endothelial origin, about the capillaries of the liver, give off nucleated red cells by a

process of germination, in which the nuclei of the mother cells play some part. The process is quite similar to the production of red cells from the endothelial cells in the area vasculosa. Later on these same cells take part in the production of non-nucleated blood corpuscles by a process of budding.

The origin of the red blood cells in post-natal life is considered by most investigators as a subject quite apart from the embryonic origin. Here it is considered that the vasoformative cells no longer play such an important rôle in producing red blood cells, and that these corpuscles are the offspring of a different tissue. It is pointed out that in the late fœtal and post-natal life, the bone marrow comes into more particular prominence as a blood producing tissue.

It is impossible to dissociate the work that has been done on the origin of the red corpuscles from that dealing with the question of the presence of nuclei in these cells. A number of authors (Klebs, Arndt and Böttcher), held that the mature red cells in mammalia possessed a neuclus, and Stricker even contended that with appropriate stains, these nuclei could be demonstrated. The idea held was that the nucleus and hæmoglobin were bound together and occupied the entire cell. However, the work of Kollman and Brunn proved that these granular bodies were free from nuclein, and, therefore, could not represent nuclei.

In view that the red cells had no morphological homologue among the other tissues, a number of authors (Hayem and Pouchet), claimed that these cells arose sui generis. It is claimed by other writers that the platelets developed into microcytes, and, eventually, by loss of the nuclei, became fully formed red cells.

One of the later theories, which is still held by some, but, nevertheless, denied by others, is that the red cells arise not unlike the development of spores within other cells. The main supporters of this view are Schaffer, Ranvier and Minot. The blood forming cells show changes like the endothelial cells, as Minot noted in the embryo. Numerous small bodies develop in the protoplasm without showing any connexion with the nucleus of the cell, and it is only by the development of hæmoglobin within these granules that they are distinguished from the mother cell. Gradually these granules develop into spherical bodies, attaining the size of the mature red cells, and many of these are seen to completely fill the protoplasm in the original body. Klein in part accepts this view, but considers that these intracellular corpuscles, which are first non-nucleated, acquire a nucleus which in the adult red cell is again lost. According to these views the nucleus of the mother cell takes no part in the formation of the erythrocytes.

The fact cannot be denied that nucleated red cells, as were first definitely demonstrated by Neumann and Bizzozero, are present under certain conditions in the blood. Whether these nucleated cells and all the non-nucleated ones have identical origin remains undecided. These nucleated cells can constantly be found in the bone marrow of adults and in the circulating blood under pathological conditions. Jones, Drummond and others contend that the nucleated reds are derivatives from certain forms of leucocytes, and that by the acquiring of hæmoglobin and loss of their nuclei, they are developed into the red cells.

The contention was more particularly supported by Recklinghausen, who claims to have followed, under the microscope, the conversion of certain forms of leucocytes into nucleated red cells. Ranvier, using similar methods to Recklinghausen, was not able to substantiate the findings of the latter. However, some years later Pouchet found that he could follow the transition of elements like lymphocytes through stages in which they gradually acquired hæmoglobin in a process of degeneration. These cells remained nucleated.

Loss of nuclei of red cells.—Before discussing the loss of nuclei of the red blood cells, it is necessary for us to recognize that these non-nucleated blood elements come into existence in two conditions. Under certain circumstances, as we have pointed out above, the mature mammalian red blood cell may be liberated into the blood directly as a non-nucleated hæmoglobin-containing body, or, on the other hand, a nucleated red cell is first developed in the blood, which later on is converted into a non-nucleated one. The direct production of non-nucleated cells takes place as has been described, from the vasoformative cells by a process not unlike sporulation. The nucleated cells, on the other hand, may be developed from different tissue elements in the thymus, spleen, liver, bone marrow and endothelial tissue. Such nucleated cells find their way into the fluid blood, and later on pass into a stage of non-nucleated corpuscles.

In the human adult there are three types of nucleated red cells which may be recognized. Under certain conditions each of these three types may appear in the circulating blood. These nucleated red corpuscles are: 1, normoblasts; 2, megaloblasts, and 3, microblasts. The significance of these cells, has, up to the present, not been determined.

The origin of these nucleated cells is still under discussion, but it is generally recognized that the nucleated red corpuscles are normal young forms. This theory is most strongly supported by Neumann and Bizzozero. Hayem's contention that the nucleated erythrocytes arise from blood platelets, has only been supported by his own pupils.

The normoblast is a corpuscle of the same size as the non-nucleated form. Its nucleus, which occupies almost the entire cell, is characterized by its intense staining. The megaloblast, on the other hand, is a larger cell with a greater amount of hæmoglobin-containing protoplasm, and its nucleus stains but slightly, and is often barely visible.

In the main there are two theories concerning the loss of the nuclei in the red blood cells. The older theory, that of Kölliker and Neumann, makes the loss of the nucleus a process of intracellular dissolution or resorption. This theory was again brought into prominence by the extetnsive researches of Löwit.

The second theory, advanced by Rindfleisch, and supported by Howell, Albrecht and others, contends that the nucleus is extruded from the red cell which then forms the non-nucleated corpuscle. Rindfleisch examined fresh preparations of blood, and noted among the ordinary erythroblasts, those with eccentric nuclei, and even some in which the nuclear body was projecting from the cell as if in a process of extrusion. Following this loss of the nucleus the erythrocyte became of smaller dimensions, while the extruded nucleus again developed new cytoplasm about it to form a new erythroblast. The opponents to Rindfleisch's view contend that these microscopical appearances are artefacts. True it is that in the preparation of blood slides one not infrequently notes the distorted and displaced condition of the nucleus, and one also finds, not alone in regard to blood cells, but also in other cells, that the nuclei may lie quite free from the cell body. These, in general, must be looked on as being artificially displaced, or the remains of degenerated cells. Several (Pappenheim and Israel), have shown that the addition of certain chemicals used as fixative agents, leads to the distortion of the cells and nuclei, and even to the production of free nuclear bodies.

Kölliker's contention of the intracellular dissolution of the nucleus was first brought out in a dissertation by his pupil, Farhnar. He observed the gradual metamorphosis of the nucleus into small granules, looking not unlike fat droplets. This contention was amplified by the researches of Neumann in 1869, who followed the dissolution of the nucleus through the same stages as Kölliker, and also observed a complete loss of the nuclear granules that were distributed in the cytoplasm. He noted that at the beginning the sharply defined nucleus became paler and less distinct, while the nuclear membrane entirely disappeared. With this gradual loss of the nuclear material, the cell, which at first showed no colour in the cytoplasm, gradually assumed a yellow hue.

Schmidt noted that the hæmoglobin-containing cells varied within wide ranges, while the nucleus was still present. With the disappearance of the nucleus, the cell assumed its bi-concave contour, and the hæmoglobin proportion increased directly with the diminution in the size of the nucleus. At the same time he could find no relationship between the quantity of hæmoglobin and the amount of cytoplasm of the cell.

Neumann's studies were based on the examination of mammalian blood in the embryo and adult.

The observation has been made by many that nuclear bodies of different kinds are present in the blood. These nuclear bodies have every appearance of extruded nuclei, and vary in size from the small platelets to that of a red blood cell. They possess but little cytoplasm about them, and represent the structures described by Rindfleisch and his school as the extruded nucleus of the red corpuscles. Neumann has also noted and studied these structures, but he regards them as young erythroblasts, which have been developed in the liver. Pappenheim points out that these structures are most probably the remains of the nuclei of degenerated blood and other cells, and, in support, maintains that the liver not only takes part in the blood formation, but also in blood destruction, and that it is in this organ that certain cells are destroyed and their contents liberated.

Löwit demonstrated the intracellular dissolution of the nucleus by experimental means. By inoculating animals with a bichloride solution he was able to demonstrate peculiar bodies within the red blood cells. The bodies were granular and took nuclear stains. Löwit looked upon these granules as the result of nuclear degeneration, and he was able to follow their gradual dissolution. During the destruction of the nuclei he did not note any nuclear extrusion.

The supporters of the theory of Rindfleisch bring strong opposition to the evidence of nuclear dissolution brought forward by Israel and Pappenheim. The former holds that the peculiarities of the nucleus, which have been noted and illustrated by the latter, are nothing further than artificial productions. By careful examination Albrecht is convinced that there is no nuclear degeneration within the cell, but there is a migration of the nucleus from the corpuscle. At times he has noted small ruptures in the cytoplasm at the point where the nucleus has been extruded.

Ehrlich has also noted the presence of free nuclei with very little protoplasm in the blood, and he believes that this protoplasm gradually absorbs hæmoglobin and develops into a new normoblast.

Ehrlich was the first to endeavour to bring the opposing views of Rindfleisch and Kölliker into agreement. He believed that the non-nucleated red cell might be developed from the nucleated one by either of these processes. In his studies he has noted that normoblasts were converted into the non-nucleated corpuscle by a process of extrusion of the nucleus, while, on the other hand, the megaloblast lost its nucleus by a process of dissolution.

I believe, however, that the strongest evidence still lies with Kölliker's theory. The mere presence of nuclear matter and free nuclei in the blood cannot be taken as strong evidence for the theory of extrusion; such nuclear substance is in part accounted for by the death of cells in the blood stream. Moreover, definite evidence in other tissues of the expulsion of entire nuclei from living and healthy cells is not forthcoming. That a process of intracellular nuclear destruction does take place in many tissues besides the blood elements is a common histological finding. We may, therefore, summarize that in the adult, the red cells under normal conditions arise mainly in the bone marrow from specialized cells, and at first obtain individuality as nucleated cells; that under certain conditions other organs may assume hæmopoietic functions during which time the endothelial tissue, particularly, is stimulated; that non-nucleated red cells may be normally produced in the bone marrow from cells as yet not determined; that nucleated cells are most commonly converted into the non-nucleated type by a dissolution of the nucleus.

Blood platelets.—An almost greater mystery surrounds the development and origin of the platelets than there is concerning the red blood cell. In viewing the question, two main considerations must be noted. Firstly, are all platelets identical in structure? And, secondly, have they a common origin? Until we have derived a more definite knowledge concerning the minute protoplasmic bodies in the blood, it will be difficult to determine anything of the nature of platelets. I think it must be recognized that the platelets described by different authors are not identical in nature. That a certain amount of granular protoplasmic debris, the result of cell disintegration, circulates freely in the blood stream, cannot be denied, and this, moreover, is borne out by the fact that all these bodies, presumably platelets, do not exhibit identical staining reactions. Howell and others suggest that the platelets are the extruded nuclei of the red cells, while Lillienfeld considers them to be derived from the leucocytic nuclei. More recently, Schwalbe is convinced that the platelets are formed as buddings from the protoplasm of red blood cells or leucocytes. The author does, however, not main-

tain that this is the only source of platelets. He points out that platelets do not evince any amœboid nature, nor do they show nuclear substance.

Sacerdotti demonstrated that under the influence of bichloride, the red blood cells show peculiar small buddings, which may be freed in the fluid and appear not unlike platelets.

Many authors have studied the nature of platelets in thrombi. In opposition to the view that platelets are definite elements possessing the power of multiplication, it has been shown that in a doubly ligated vessel, platelets were increased in immense numbers as thrombosis took place, while at the same time the blood cells were undergoing degeneration.

Albrecht points out that the presence of basic-staining substances within platelets does not necessarily point to the presence of nuclear material. He believes that the lecithin degeneration products of the red cells are accountable for the basic staining nature of some of the platelets.

Quite recently, Wright has brought forward a new contention. He regards all previous ideas, as to the origin of the platelets, as wrong. In his investigation, he has found that small bodies resembling platelets are budded off from the giant cells (megakaryocyte), of the spleen and bone marrow. In the marrow he distinguishes these cells definitely from the osteoclasts. He finds that the cytoplasm of the giant cell is granular, the granules resembling those seen in the platelets. The giant cell is amœboid, and sends out long, narrow processes, which become divided up or cut off into small bodies which are then liberated into the surrounding fluid. These pseudopodia may even stretch between the endothelial cells of the blood capillaries, and in this position give off the platelets.

Basophile granulations of the erythrocyte.—These granulations were first described by Askanazy, in 1893, and since that they have been studied by Shaumann and Lazarus in various forms of anæmias. Askanazy first suggested that these granules were the result of karyorrhexis, a view which has been accepted by many. Grawitz, however, insists that they arise from a degeneration of the cytoplasm. Though the origin of these granules is still undecided, the weight of evidence favours the theory of their nuclear origin.

Origin of leucocytes.—The white cells of the blood make their appearance at a later date than the red cells. The exact origin of these first leucocytes is still uncertain, but, at all events, they are derived from

a mesenchymatous tissue. It is thought by some that these early cells are distributed throughout the body to form the later lymph nodes.

After lymph glands appear they probably assume a function of producing leucocytes, and it appears evident that the various leucocytes form different elements in themselves, which have the power of multiplication by mitosis.

It is difficult to make a comparison or to draw any conclusion as to the origin of the white cells by the study of the various vertebrates, for the mode of origin in these different species varies. Thus, in fish and certain amphibia, the bone marrow takes no part in blood formation, and in other vertebrates the lymphatic system is wanting. So we must confine our remarks to the conditions found in man.

The first white cells develop as specific elements from certain embryonal mesoblastic cells, and for some time previous to the development of definite blood forming organs these primary leucocytes multiply in the blood stream. Soon after this the leucocytes are developed at certain sites, which Saxer holds become established by the proliferation of obstructed leucocytes in the mesenchyme. Saxer believes that both red and white cells are produced at these sites.

The thymus gland is considered by most authors as being *par excellence,* the most important organ producing leucocytes in the embryo and fœtus. A number of authors, (Beard, Nussbaum, Schulze and Bell), maintain that the epithelial tissue of the thymus is converted into lymphatic tissue. Beard goes so far as to say that all lymphatic tissue has its origin in the thymus.

It is important to note that certain lymphatic tissue is developed from cells which have wandered to the site from elsewhere, either from the blood or from tissue cells. In the fœtal liver small collections of leucocytes are found on the outside of the capillaries. Whether these cells have originally wandered into these sites, or whether they became developed from the capillary endothelial cells is difficult to say. It is, however, evident that the liver is more active in producing white cells during the first half of fœtal life than it is later. At what stage the spleen enters into the production of leucocytes is not known. The bone marrow is the last tissue which takes on the function of producing white cells. Some believe, that the white cells produced there, are derivatives of leucocytes which have wandered in, others hold that the white cells arise from the connective tissue of the part.

Askanazy supports the view that leucocytes and red blood cells are developed from definite cells which constantly reproduce these cells, but he is also inclined to believe that other than these specific cells may

take part in the production of blood cells in the fœtus. Although the fœtus possesses many organs for forming white cells, the blood in the early fœtus is comparatively free from white cells. Askanazy points out that at this time these lymphatic areas are rather a kind of store-house, than an exporter of leucocytes.

The origin of the leucocytes differs somewhat after birth. Flemming first noted the multiplication of the leucocytes in the blood stream, and since then this has been confirmed by Loewit, Arnold, Hayem, Spronk, Dock and others. However, it was soon evident that such mitoses occur but rarely, or only under pathological conditions.

In dealing with the origin of leucocytes in the adult our attention is naturally drawn to the lymph glands. These glands are producers of leucocytes, but their greater function lies in being available store-houses of leucocytes for the blood to call on. Not alone do the lymph glands produce leucocytes for the blood stream, but also for local use and for the infiltration of the neighbouring tissue when this is needed.

Neumann has noted the fact that more lymphocytes are distributed into the blood stream than are accounted for by the lymphocyte count. He believes that some of these cells become granular and polynuclear leucocytes. Flemming has noted the occurrence of multinuclear leucocytes in the cortex of the lymph glands, presumably derived from lymphocytes.

Exactly what part is played by the spleen in the production of white cells is not known. Extirpation of the spleen, too, has not shed any new light on the subject, save that there is a temporary increase in the lymphocytes of the blood. Whether the spleen is a blood producer at all, or only represents a blood filter, is difficult to say, (Askanazy).

In extra-uterine life the bone marrow is the most important producer of leucocytes, other than lymphocytes. The emissary veins are constantly crowded with polynuclear cells, which are still undergoing division. Ehrlich made the discovery that no other organ showed the number and variety of granular leucocytes and he maintained that the granular white cells were derived only from the marrow.

The granular leucocytes, according to Ehrlich, are to be sharply differentiated from the lymphocytes, with which they have no genetic similarity. The former are cells which develop in extra uterine life, and which may be divided into three classes, with neutrophile, eosinophile or mast-cell granulations, the latter are in greatest proportion in fœtal life and arise in the thymus and lymphatic system. Whether such a sharp distinction in morphology, function and origin can be

drawn between the lymphocytes and the granular leucocytes is a debatable question.

According to Neumann in some of the lower animals, lymphocytes almost alone appear in marrow, and these cells become granular leucocytes in the circulating blood. It has long been demonstrated that lymphocytes are more or less amœboid, and that they also possess certain powers of phagocytosis. Askanazy points out that the variation in amœboid power is one relative to the quantity of cytoplasm. This author also believes that the development of granules within the cells is a specific product of the cell protoplasm.

Wolff and Michaelis claim to have demonstrated that the basophilic protoplasm of the lymphocytes may develop within it certain granulations. Such cells can be found in all stages of development in the bone marrow, and may be followed to the completely formed multinuclear leucocytes.

Shridde is convinced that cells possessing certain definite granulations retain this type through their existance and do not alter themselves into new forms.

It may be too, as some have held that the giant cells of the bone marrow are the mother cells of not one but various orders of leucocytes.

Mast cells occur but rarely in the blood, and little is known definitely of their genesis.

Ehrlich has been the main contributor to the work in the varieties and differentiation of the various leucocytes. He pointed out that the staining qualities of the leucocytes varied, and that these differences were due to the presence of granules of different chemical affinities. On the character of these granules in the leucocytes, and the nature of their staining Ehrlich devised an elaborate classification. This classification, based on similar observations was later simplified by Kanthack and Hardy, viz., (1) Finely granular oxyphile; (2) Coarsely granular oxyphile; (3) Finely granular basophile; (4) Coarsely granular basophile; (5) Lymphocyte; (6) Hyaline cells.

The hyaline cell described by Kanthack is the large macrophage which has its origin from the endothelial cells of the blood and lymph vessels and from the lining of the serous cavities.

Coagulation of blood: Physiologists recognize that next to color, viscidity is the most distinctive feature of the blood, outside the body. The actual viscidity varies but little during life. When blood is shed, rapid changes take place in it, chief among which is the appearance of clotting with fibrin formation. Fibrin makes its appearance in shed

blood in from ten to twenty seconds. In this short time, therefore, definite changes have taken place in the blood mass, which suggest that these changes commenced at the moment of shedding.

The contributions made by Hewson and John Hunter, form the starting point of our knowledge of the coagulation process. Later the studies of Buchanan, Denis, Schmidt and Hammarsten, laid the foundations for the theories of the clotting of blood. In the main their studies were the observing of certain facts such as, that blood retained within living vessels does not clot; blood plasma will clot in a like manner as whole blood; contact with foreign particles hastens clotting; a protein substance, fibrinogen, can be precipitated from the normal plasma; another substance thrombin or fibrin-ferment which is destroyed by heat can be separated from blood; this ferment converts fibrinogen into an insoluble fibrin; the formation of the fibrin network takes place in the vicinity of the blood platelets and all fluids containing fibrinogen will coagulate with fibrin ferment.

Since coagulation is dependent on the action of a ferment on fibrinogen, the studies on clotting mainly concern, (1), the formation of the thrombin, (2), and the conversion of fibrinogen into a primary soluble fibrin, which then rapidly passes into the insoluble state.

In 1875 Hammarsten demonstrated the fact that the addition of calcium salt to coagulatory fluids increases the yield of fibrin, but the necessity for the presence of this salt was not recognized until fifteen years later by Reynolds Green. He pointed out that if the calcium salts were removed from the plasma by dialysis, coagulation did not occur. Since the determination of this phenomenon, various means have been devised to inhibit the coagulation of blood by ridding the fluids of their calcium content.

It was first believed by Arthus and Pages that calcium-free plasma contained thrombin or fibrin ferment, since it could coagulate fibrinogen solutions, and as the fibrin yield varied with the quantity of calcium present they believed that this salt played a definite role in the second stage of fibrin formation. Pekelharing repeated the experiments and showed that the calcium-free plasma did not contain fibrin ferment, but that it contained a prothrombin which in combination with calcium was thrombin or fibrin-ferment. This author believed that the calcium containing fibrin-ferment handed on the calcium to the fibrinogen in the process of clotting, to produce fibrin.

Schmidt denied the specific action of calcium in the phases of coagulation, and held that the presence of calcium only favored the conversion of a zymogen into an enzyme.

The role played by the calcium was eventually cleared up by Hammarsten. He found that calcium was normally present in the blood in two states, (1), either as the free salt, or, (2), in combination with proteids. In oxalated blood it is the free calcium alone, which is precipitated and hence it is this free salt which is important. When this non-coagulable oxalated plasma is cooled to 0°C. a fine precipitate separates out and as this occurs the plasma loses its power of clotting with the addition of calcium. Therefore, this second precipitate is an important factor for coagulation. From the clear supernatant fluid Hammarsten was able to isolate a calcium free fibrinogen which he could clot by the addition of a calcium-free thrombin or ferment. Hence it is proved that the calcium salt is not essential in the conversion of fibrinogen into fibrin. On the other hand, the calcium seems necessary for the formation of fibrin-ferment from the pro-thrombin, that is the calcium converts the zymogen into the enzyme as Pekelharing had stated.

It has been noted by many investigators that certain tissue extracts accelerate the coagulation process. By some it was contended that the disintegrated nuclear material of degenerating cells assisted clotting,—others regarded the cytoplasm as the stimulating substance. Field came to the conclusion that the tissue extracts were a necessary factor for the formation of thrombin. According to him, an element from the plasma unites with a certain element from the tissue cells, and these two agents along with a calcium molecule make up the thrombin or ferment.

Blood which is allowed to flow about in the subcutaneous tissues, or to which a tissue extract is added coagulates more rapidly than that taken directly from the vessels. It seems evident, therfore, that tissue extracts contain an active principle, thrombo-kinase, (Morawitz), which is concerned in the formation of the ferment.

In short, the prothrombin is present in the circulating blood, and is activated in the presence of calcium by a zymoplastic substance obtained from leucocytes or tissue cells, (Schmidt).

Morawitz believes that thrombin or fibrin-ferment has its origin from two sources. On the one hand the zymogen appears in the plasma and is activated by calcium salts alone, the other exists in the serum separated from the coagulated blood and can be activated in the absence of calcium by weak acid or alkalies.

Outside the body the morphological constituents of the blood, and in particular the blood platelets yield thrombo-kinase when brought in contact with non-living matter. As to the origin of the zymogen or thrombogen there is little known.

In these reviews I have drawn extensively from the writings of Minot, Askanazy, Pappenheim, Buckmaster and others.

EXCESSIVE LENGTH OF THE SIGMOID FLEXURE AND ITS SURGICAL SIGNIFICANCE.

by

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It is universally acknowledged that there is much variation in the length of the sigmoid flexure, within what may be described as normal anatomical conditions.

The normal length of the Sigmoid Flexure in the adult, is stated by E. H. Taylor, (Applied Anatomy), to be "about 17 inches," the "average length" in Morris' Anatomy, 17½ inches, and the "length of the sigmoid" in Deever's Surgical Anatomy, 17-18 inches, in Gerrish's Anatomy, "14 inches or more," while Byron Robinson classes as "unusual length" or giant sigmoid, anything in excess of 25 inches.

Anatomists, pathologists, and surgeons each from their own points of view, are constantly interested in what may be called the normal variations in the length of the sigmoid, but in this communication, I shall consider only those of unusual length, say, in excess of 25 inches in the adult. In the Medical Standard of Chicago appeared, during the past year, (March to November, 1907), a series of articles on the sigmoid flexure, by Byron Robinson, B.S., M.D., in which the anatomy and physiology of the sigmoid are most fully and exhaustively dealt with.

From these articles I take the liberty of quoting the following statements:—"The sigmoid is a fæcal reservoir. The sigmoid begins at the distal end of the left colon, and ends at the proximal end of the rectum. It is a single, inseparable, indivisible, colonic loop extending from the colon to the rectum."

"In 490 males there were 6 subjects with a sigmoid of 26, six with 28, seven with 30, three with 32, and one with 36 inches in length."

"In 165 females there were 3 subjects with sigmoid of 26, four with 30, one with 32, and one with 33 inches in length."

"The sigmoid is relatively long in youth and short in adult life. In 485 males, (in a series of 700 autopsies), the maximum length was 36 inches, the average was 19 inches, and the minimum was 6 inches. In 165 females the maximum length was 33 inches, the average was 17 inches, and the minimum was 5 inches."

"The sigmoid has the widest range of motion of all the abdominal viscera. It varies greatly in position, length, diameter, distension, and evacation."

"It lies in the right iliac region in 19% of cases (Huguier's position)."

"Giant vertical sigmoid occurs in 7% of males and 6% of females."

"Curshmann describes 15 monster sigmoids in 233 bodies, which means 6%."

"Prof. Wenzel Gruber reports a giant sigmoid of 41 inches in length, and he remarked that when he exposed the viscera by an abdominal incision, only colon and a small portion of the bladder was observed—the giant sigmoid almost completely occupied the abdomen."

I have also the following communication from Dr. Klotz based upon his autopsy experiences:

Observations made on the sigmoid in a great number of autopsies reveal to the pathologist the great variation that may be present in this organ. These variations consist mainly in the site and size of this part of the bowel, and attention is attracted to them by the frequent distension (gaseous and otherwise) of the entire colon. There is one type of sigmoid which possesses in its lower portion a very short mesentery, so that the bowel is closely tied down to the brim of the pelvis and the sacrum. In these cases the mesentery may not be more than an inch in length; in others again, in which the sigmoid is to all appearances normal, the mesentery may exceed ten inches. It has been noted in this latter type of mesentery that an exceedingly long mesentery does not necessarily allow the sigmoid to be twisted on itself. In those cases in which the base of the fan-shaped mesentery is broad and does not converge to a point, the sigmoid, although lax and able to stretch across the abdomen to the cæcum, does not readily become twisted. On the other hand, where this mesentery converges to a common centre so that the first part of the sigmoid is in close relation to the first portion of the rectum a twist can readily be produced artificially.

Slight variations in the site of the mesenteric attachment occur frequently and a dextro-position is occasionally met with.

In three cases of malignant disease of the pelvis obstructing the rectum the dilatation of the sigmoid and colon was especially noted. With this enlarged sigmoid there appeared in each case a lengthened mesentery. In two cases of pernicious anæmia an abnormally large bowel, including the sigmoid, was present, and in two children a similar condition was noted.

From the observations made in the general run of autopsies an enlarged colon and sigmoid is frequently noted among those giving a history of chronic constipation. These enlarged sigmoids usually lie above the brim of the pelvis and are commonly found lying towards the cæcum on the right. The mesentery in these cases is unduly lengthened. When, however, the sigmoid is collapsed it is found coiled up in the cavity of the pelvis.

The causes of excessively long sigmoid are partly congenital and partly acquired.

In those cases which call for treatment by the physician or surgeon, there can be little doubt but that the starting point was originally a congenitally long sigmoid with a long and free mesosigmoid, and that distension was subsequently produced and elongation increased by accumulation of feces ("Hirschsprung's Disease"), or by constipation, accumulation of gases, malposition, etc.; although it is conceivable that the acquired causes, alone, operating upon a sigmoid of not more than ordinary length might produce a giant sigmoid. The following are abbreviated histories, taken from the hospital records, of 3 cases upon which I have operated:—

Case I.—W. E. aet. 3½ years was admitted to the Royal Victoria Hospital, Jan 3, 1896. This patient seemed to be all right at his birth, but his bowels did not move for 5 days, and after purgatives a movement was produced. During the first year of his life, the patient was constantly constipated, going as many as 11 days without movement, after which the administration of a glycerine suppository or castor oil would produce a movement. For a year he had no enlargement of the abdomen and suffered no pain and was a very quiet baby. Flatus always passed very freely. For about 2½ years, prior to admission the abdomen had been swollen, and had never come down to normal size. Up to Christmas, 1895, this condition had continued with varying degrees of distension, free passage of flatus and inaction of bowels, except by use of purgatives, but without pain. The stools as passed, presented at first large lumps of solid fæces followed by a small continuous solid evacuation quite round and about the size of the little finger. At two periods—about 12 months and 9 months before admission, he had diarrhœa for 2-3 days but the bowels soon became blocked again.

On Christmas day, 1895, after injection, he had several movements but after these ceased there were no more stools for a long time and the flatus ceased to come freely and distension and pain became marked, the distension exceeding anything it had ever reached before. Attempts were made to move the bowels about every second day by injections but very small quantities only came away and very little wind. The father used to rub the patient's abdomen when he suffered from colicy pain, and it often brought wind up by the mouth. On Sat. Jan. 11th, after a standard enema and castor oil, the patient had an enormous stool, first solid then semisolid, and later liquid with a great deal of flatus.

There was nothing unusual in the personal or family history and the organs were sound. The abdomen presented an extreme enlargement of uniform size. The girth at the largest part was 27¼

inches and from the ensiform cartilage to the pubes the measurement was 13 inches.

Well marked peristaltic movements were excited by palpation, with rumbling of gas. The abdomen was soft and unresistant. There was no tenderness. The boy was rather pale but took his food well and nutrition seemed, on the whole, fairly good. On January 16th. I opened the abdomen by a median incision below the umbilicus. A small quantity of clear serous fluid escaped. There was great distension of the sigmoid with gas and feces. A finger introduced into the rectum met with no obstruction at its junction with the sigmoid and could be felt by the hand in the abdomen. A rectal tube was passed well into the sigmoid but no flatus escaped. As there was no obstruction, it was thought that the bowel might be evacuated by enemata and purgatives and the wound was closed. After operation, enemata produced large stools and much flatus. On the 30th of January, as the patient's progress did not seem sufficiently satisfactory, the abdomen was opened again in the left inguinal region. Bougies were again passed into the sigmoid and attemps made to assist evacuation but without result. The sigmoid was brought outside the abdomen and punctured by a large trocar and quantities of semi-solid feces removed after which the punctures were carefully closed by suture. The intention was to facilitate the employment of enemata by partial evacuation of the retained feces.

The child's condition remained satisfactory until Feb. 6, when he developed peritonitis, grew rapidly worse, and died at 6.30 p.m.

At autopsy, 17 hours after death, it was found that one of the punctures had reopened and feces had escaped and the child had died of peritonitis. The large intestine measured from sigmoid to cæcum 50 cm. The sigmoid itself measured 38 cm. and contained 850 grams of feces. The descending colon was thickened, somewhat dilated and its mucosa congested but otherwise the intestines, large and small, were normal.

(This case was the subject of a paper read by Dr. C. F. Martin before the Montreal Medico-Chirurgical Society on the 20th of Nov. 1896).

The paper was entitled "On So-Called Idiopathic Dilatation of the Large Intestine" (Hirschsprung's Disease), and was published in the Montreal Medical Journal, Vol. XXV. Page 697. I am indebted to Dr. Martin for permission to reproduce the illustrations published with his paper.)

Case II.—Wm. S. aet 36, was admitted to the Royal Victoria Hospital at 2 p.m. Feb. 6, 1906, with the following history.

For the past 3 weeks he had been feeling out of sorts with what he calls a "bilious attack," suffering off and on with headache nausea, constipation and wind pains in the abdomen.

On Friday, Jan. 31st, he had a kind of fainting attack when in his cellar at home and for this he took salines and had a good movement of the bowels on Sunday. Monday the patient was not extra well but had no definite trouble. Patient had severe abdominal pain Tuesday morning, but went to work, but the pain became so severe that he had to come home at 2 p.m. During Tuesday and Wednesday, (Feb. 4 and 5), attacks of abdominal pain were very severe and required morphia. Salines oil and enemata were tried but had no effect on the bowels, and on Wednesday evening, the patient began vomiting, and by Thursday morning, the vomited matter was dark and smelt badly, and the patient came to Hospital at 2 p.m. (Feb. 6, 1906).

Personal History: The patient had always been healthy except for chronic constipation and flatulency. He had tapeworm 4 years ago. His habits have been regular and he uses no alcohol nor tobacco.

Family History: Good.

Present Condition: A thin muscular man of medium height; face very pale and of abdominal type showing great distress; lies in bed with knees drawn up and at times writhes in agonies of pain felt across the abdomen. T. 98; P. 72; R. 24.

Abdomen prominent especially upper zone, tympanitic and tender all over to palpation.

Rectum normal. Organs normal.

The abdomen was opened immediately, in the middle line below the umbilicus. The intestines were dark colored and the sigmoid flexure was found twisted upon itself with a double twist. It was delivered from the abdomen, the twist undone, and a rectal tube passed from the anus through which gas and feces escaped. The sigmoid was very long and very large, but no attempt was made to measure it.

The abdominal wound was closed and the patient made an excellent recovery and was discharged on the 20th of Feb. 1906.

I advised him, however, that on account of the great length of the sigmoid he would be exposed to the risk of subsequent volvulus, and that in my opinion, it would be wise before he left the Hospital to have the sigmoid flexure excised altogether. He would not consider this advice, however, and left as already said, at the end of two weeks. On the 21st of September, 1907, (19 months later), he was *readmitted*, complaining of severe abdominal pain, constipation and distension.

Since leaving the Hospital last year, the patient had been in good health save for occasional attacks of general abdominal pain, with cons-

tipation and some distension, never lasting more than one day. He had been quite well during the past month. Bowels were regular up to Friday 17th, on which day he had several "watery stools." On Saturday and Sunday. (18 & 19), he had similar stools. He did not notice if there was any blood in them. There was no straining to pass the stools, but during Saturday and Sunday, he felt after each stool as if he were not finished. Yesterday morning (Mon. 20), he was wakened at 5 a.m. by a severe pain of indescribable character, not griping, felt all over abdomen but mainly in the epigastrium and around the umbilicus. This was the first pain he had had, and he had been feeling well and doing his work up to this time. (Had had beans for Sunday dinner). Two hours later he took a dose of Castor Oil which had no effect. Vomiting began in the afternoon, and was frequent and severe all afternoon, but abated somewhat during the night. The vomitus had no dark look and no had odor; he calls it "bile." No vomiting to-day, (Tuesday). Pain remained constant and severe all day and all night; he has had none to-day except for slight paroxysms at frequent intervals. Has passed no wind since the onset of the pain (30 hours).

Present Condition:—Patient is a well-nourished man; face anxious but not "abdominal;" tongue slightly coated but moist, color and pulse good, respiration normal.

Abdomen:—The abdomen is uniformly distended, tympanitic all over; not tender on pressure. Liver dulness mostly obliterated. Occasionally waves of contraction pass over bowels throwing abdominal wall into irregular furrows and elevations, lasting 1-2 minutes at a time. Rectum normal, though coils of distended intestine are felt pressing down to rectum. No mass can be felt in the abdomen. Scar of old incision scarcely visible. T. per rectum 99.03. Organs normal.

He was immediately operated upon again. Incision in the middle line; some free serous fluid in the abdominal cavity; a loop of the distended sigmoid presented, moderately congested; the loop is described as appearing to be about 2 feet in length. A single twist or half turn was found at the extremities of the sigmoid which was easily corrected when the bowel was delivered from the abdomen. A rectal tube was passed to demonstrate the freedom of communication with the rectum.

The wound was closed and the patient as before made an excellent recovery.

As I knew from previous experience the probable condition, and as his general condition was good, I advised him before undertaking this operation to allow me to remove the sigmoid, but he would not consent.

About 2 years later, he was taken ill in some small town near Boston, with what he recognized as the same trouble as he had previously been

operated upon for, and after about 24—36 hours of these symptoms, he left by train to come to Montreal and died on the train before its arrival in Montreal.

These later facts concerning his last illness were obtained for me by Dr. J. A. MacDonald, from the patient's wife. Unfortunately at this late date, we are unable to secure any fuller details.

Case III.—E.W.L. aet. 42, school-teacher, was admitted to the Royal Victoria Hospital at 9 p.m. Wed., Nov. 27, 1907, with the following history:—

For years the patient has been troubled with irregular attacks of severe constipation coming on at intervals of 2 or 3 months or less frequently. He has always had to pay strict attention to his bowels and frequently used purgatives. About 2 years ago, he had a severe attack of constipation lasting for 4 or 5 days, accompanied by pain in the lower half of the abdomen. The pain was not very severe and the constipation was relieved by the use of castor oil, after having been 4 or 5 days without a movement of the bowels. Since then he has never been laid up a day until the present attack, although he has had from time to time other attacks of constipation lasting 2 or 3 days. Since last Thursday morning, (Nov. 21st),—6½ days—his bowels have not moved, and on Friday morning he commenced taking purgatives which proved ineffectual. He passed some flatus on Saturday. He felt out of sorts but continued teaching his class until Monday, when he first consulted a physician. On Tuesday morning about 9.30, he was seized with very severe gripping pain in the lower half of the abdomen, and this has increased in severity since, and has become general throughout the abdomen. On Saturday, he complained of being "puffed up," and his wife in applying hot poultices to the abdomen, noticed this distension increasing—but on Tuesday it increased rapidly, and on admission the abdomen was markedly distended. On Tuesday afternoon, he found that he could not take a long breath, and on admission there was marked dyspnœa. He felt nauseated on Monday, and this continued until admission at 9 p.m. Wednesday, November 27th, and he vomited two or three times on Tuesday and once after admission.

Personal and Family History not important.

The patient was moribund on arrival at the Hospital, the pulse could hardly be felt at the wrist, the heart sounds were feeble, he was livid, temperature subnormal, breathing very rapid and shallow, but he was mentally quite clear. He complained of pain in the abdomen, more particularly in the lower half. There was a slight amount of albumen in the urine. There was great distension of the abdomen, showing ex-

cessive fulness in the lower part and right side with corresponding relative flatness in the upper and left portion.

The abdominal wall was as tense as a drum. There was no liver dulness on percussion. The abdomen was opened immediately by a long vertical incision over the most prominent part of the swelling to the right of the right rectus muscle.

On opening the peritoneum, an extremely large distended bowel of greenish gray color evidently gangrenous presented in the whole length of the wound. There was also a large quantity of foul smelling dark blood-stained serum free in the peritoneal cavity. This coil of large intestine was so distended and apparently so fragile that it was punctured and a large quantity of blackish fluid resembling altered blood evacuated before delivering it from the abdomen.

It was then found to be the sigmoid flexure twisted upon itself at its extremities and was promptly removed. The rectal and colic extremities were invaginated by purse-string suture and further secured by Lambert sutures, and a loop of the transverse colon was brought out through the abdominal wall on the left side and a Paul's tube inserted.

The abdomen was flushed with saline solution, the wounds closed, and although the patient's condition was extremely grave throughout he lived until 3 o'clock the following day, during which time he had no pain nor vomiting nor any symptoms of any kind except great prostration. His death was evidently due to toxæmia which had occurred through the gangrenous bowel before operation. The history would seem to indicate that the vitality of the obstructed bowel had become so lowered by Tuesday morning (36—40 hours before operation) that transudation of contents and secondary symptoms began then.

The sigmoid flexure after removal measured 59½ inches in length. It was impossible in the circumstances to determine its diameter, but I should say that it must have been 5 or 6 inches at least. The extreme length and diameter of the sigmoid in this case was no doubt due to some extent to the mechanical stretching during the period of obstruction. It will be noted that in both the cases operated upon for volvulus of the sigmoid the patients had suffered all their lives from constipation and flatulence, and both had had many attacks which in the light of later experience would seem to have been due to partial or temporary obstruction, and it is not difficult to understand how an exceptionally long and freely movable sigmoid becoming overloaded might assume a position which would cause temporary obstruction.

A considerable number of cases of both the foregoing varieties of elongated sigmoids are reported; but in many of them, measurements are not given and the reports are otherwise incomplete.

Surgical Significance of excessively Long Sigmoid:—The sigmoid flexure has received much attention from surgeons in recent years, and the conditions known as sigmoiditis, mesosigmoiditis, diverticulitis, and diverticula of the sigmoid, are well known.

The length of the sigmoid is also a very important factor in planning a radical operation for cancer of the rectum.

I do not propose, however, to refer to any of these conditions but only to discuss the conditions illustrated by the cases reported viz.:—"Hirschsprung's Disease," and obstruction from volvulus of the sigmoid due primarily to its extreme length. In both conditions the only satisfactory treatment would seem to be removal of the sigmoid. This at first sight may appear to be a somewhat radical recommendation, but in my opinion, it is fully justified by the seriousness of the conditions. Quite recently Mr. Arbuthnot Lane, of London, has published a series of 39 cases in which he had removed a part or the whole of the large intestine for constipation of a chronic and obstinate character.

In Case No. 1, operated upon 12 years ago, the operative measures adopted were of a palliative character and the child died. To-day I have no hesitation in saying that the proper treatment for such a case is the removal of the enlarged and overloaded sigmoid and the re-establishment of communication between the descending colon and the rectum. It would appear to be useless to hope for the restoration of function in the sigmoid in such a condition, even if it could be unloaded and kept evacuated for a considerable period of time.

With regard to the second condition, it is almost a surgical axiom that from one half to two thirds of the cases of intestinal obstruction from volvulus are due to volvulus of the sigmoid; also that recurrences are common and that they are probably common in direct proportion to the excessive length and mobility of the sigmoid.

Moreover, no device hitherto adopted for anchoring the sigmoid so as to prevent this recurrence has proved satisfactory.

In Case No. 2, I recommended after the first operation and before the second, the excision of the sigmoid, but the patient would not consent to it. It will be noted that this patient had three attacks of volvulus within three or four years, the last of which was fatal before operative relief was obtained.

THREE CASE REPORTS.

BY

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Of the three cases here reported there is but one which may be called complete, namely, that of Ritter's disease. In the other two, as is usual in a country practice, no post mortem could be obtained, and therefore an imperfect picture is presented. The diagnosis, however, seems to be sufficiently clear to warrant publication. At least two of these cases are rare enough to be placed on record. The third, though not rare, is uncommon; and in the absence of melœna or hæmatemasis is not likely to be thought of as a possible diagnosis in an obscure case.

A Case of Congenital Atresia of the Posterior Nares.

On December 15th, 1905, I was called to a confinement (IV. para) which followed the course of a L. O. A. without complication. The child appeared to be healthy, weighed 7½ lbs. and had a good quantity of subcutaneous fat. It cried heartily for a short time after birth, and required nothing but a splash of cold water to start respiration. On subsequent examination, however, I noticed that it breathed in a very noisy manner, like one breathing through the closed lips. As the throat was filled with mucus, the condition was at first put down to the blocking of the nose with this thick tenacious material, but, after cleansing as well as possible, it was seen that no air was passing through the nostrils. As the matter seemed to be of no immediate importance further examination was postponed until next day, when it was found that the posterior nares were blocked in such a way that a small olive pointed filiform could not be passed down to the pharynx on either side. The child was put to nurse, but it was found that it was impossible for it to take the breast, although apparently anxious to do so, as only a choke and splutter resulted from all its efforts to obtain nourishment in this manner. The question of immediate operation arose at this time, but it was considered unwise to subject a child of three days old to an operation, no matter how simple, unless it was evident that it could not get enough food otherwise.

It was found that with a bottle a careful nurse could supply ample nourishment if care was taken to allow the child only two or three swallows between each breath, and for a couple of weeks all went well. On the 20th day I was asked to "stop a diarrhœa" which had begun four days before, and which was accompanied by vomiting. Examination

Reported at the District of St. Francis Medical Association.

showed some emaciation, and I was told that the child was fed whenever it cried instead of every two hours as directed.

Regular feeding with white of egg in water soon regulated the bowels and under a strict two hour regime she began to pick up, and by the twenty-fourth day seemed better than ever before.

Unfortunately, on the twenty-sixth day the one who had been devoting all her time to the child had to leave, and she was left in the hands of those unaccustomed to the work.

I was once more called in on the thirty-first day, only to see that the child was dying. It was very pale and cold with sighing respirations through the open mouth, and heart beat barely perceptible. It died in three hours, on January 21st.

A post mortem was not allowed further than a digital and instrumental examination of the posterior nares. This confirmed the original diagnosis, though whether the occlusion was of bone or membrane I could not discover. Inanition was doubtless the primary cause of death.

Prof. W. Kümmel states that about forty cases of congenital closure of the posterior nares have been observed. In the typical forms the membrane lies just in front of the margin of the posterior nares, the latter being perfectly normal in other respects. In atypical forms there are extensive adhesions covering a wide area, which frequently involve the naso-pharynx also. Further, Hoag seeks to explain this malformation by a persistence of the bucconasal membrane, which during fetal life shuts off the posterior nares.

Kümmel also says that bony closure would hardly be expected at an early age, and thinks that operation should be postponed until later, nourishment being supplied by spoon or stomach tube.

A Case of Dermatitis Exfoliativa Neonatorum (Ritter's Disease).

On December 18th, 1907, I was called to attend Mme. R. in her third confinement. The labour was completed without any complication and was comparatively easy, the child being in the L.O.A. position and not very large.

The child was healthy and at full term, notwithstanding the fact that I had been called in on May 12th for a threatened abortion.

The mother had been anæmic since her last child was born (August 19th, 1906), and was never very robust, although not complaining of any definite trouble. She had never nursed any of her children, yet they were all healthy and well grown. There was no history or evidence of syphilis.

The baby weighed 7¾ lbs. and was normal in every respect. It was washed with olive oil, castile soap and soft water, and the cord was

tied with a sterile ligature, and cut with sterile scissors, and then wrapped in aseptic absorbent cotton, according to my usual technique. It separated normally without suppuration in about one week. The infant was put on modified milk and did well.

On January 8th the father called to see if I could give him something "to prevent the skin from coming off the baby," and upon going to see it I found a most extraordinary object. Th epidermis of the neck and back was completely gone, leaving a red glazed surface such as one sees under a scalded area of skin. The abdomen was partly bare and partly covered with what looked like damp tissue paper. The buttocks and thighs were in the same condition, but the arms and legs showed merely a red erythematous patchy rash extending from the body downwards. The face was in much the same condition as the abdomen, although smaller areas were denuded, and the mucous membrane of the mouth lay wrinkled upon the lower layers. The skin about the anus showed a few fissures, but there was nothing of this sort around the mouth. The child had no fever, but was very restless and cried incessantly, yet it took nourishment well and did not lose weight.

The clothing was of the roughest description, and when I had it changed for linen saturated with zinc oxide ointment and surrounded with cotton wool, the baby fell asleep and gave very little trouble afterwards.

The parents stated that the rash had appeared a few days before I saw it, beginning about the neck, and before they could realize that it was anything unusual the skin began to peel off in sheets. The whole process lasted about seven days, and the convalescence was free from complication, no scarring resulting from the desquamation.

I saw the child last on February 10th and it looked fat and healthy.

Those interested in the subject should refer to the article by E. P. Carlton in the *New York Medical Journal*, September 28th, 1907. He reports a case, and gives a complete bibliography from 1878, when Ritter reported 297 cases, with a mortality of 48.8 per cent. Since then there have been but 33 reported, with a mortality of 55 per cent. in the 29 which were followed out and completely reported.

A Case of "The Hæmorrhagic Disease of Infants" (Holt).

On February 11th, 1908, I was called to a case of confinement (XVI para.) in which the patient was delivered of a male child weighing twelve pounds, after a rather precipitate labour, the only delay occurring after the head was born, due to the broadness of the shoulders.

The child cried at once, and did not require any measures to induce breathing. It was cared for in the usual way, and when carefully ex-

amined seemed to be in very good condition. It slept well and took the breast normally some six hours after delivery. I saw it again ten hours after birth and it seemed to be perfectly well, but about six hours later, at 4.30 p.m., it began to cry, and became restless, drawing its legs up on the abdomen as if in pain. I was absent at the time, and Dr. McCabe, of Windsor Mills, was called in to see the child. It did not appear to be very ill, the pulse being about normal and the respiration a little hurried. The abdomen was somewhat distended and a little tender apparently, while on the back a few patches of dark purple colour could be seen. No urine had been passed and the bladder was empty. Later the child began to vomit some very dark coloured material, which proved to be blood, and then it began to pass similar motions by the bowels. At the same time the left side of the scrotum became infiltrated with blood and turned quite blue-black in colour.

Pallor and profound weakness followed, and the little patient died about one in the morning; some twenty-four hours after birth.

The diagnosis of this case, perhaps, presents some difficulties. On account of the size of the child some direct laceration or injury to the abdominal viscera might be expected, but on the other hand, the mother has seldom had a child weighing less than eleven pounds, and several weighed twelve, all her labours being over in a few hours. This time the pains began about ten at night and the delivery was accomplished at about half past twelve. On account of these circumstances I took particular care to examine the baby in detail for possible injuries, without success. All other evidence points to a hæmatogenous origin of the trouble. The absence of symptoms for over fifteen hours, the natural appearance and conduct of the child for this length of time would be extraordinary had there been any lesion extensive enough to cause death within nine hours after the first symptoms. The early appearance of hæmorrhagic spots on the back followed by melœna and vomiting of blood as well as effusion of blood into the scrotal tissues seems to clinch the diagnosis as being what Holt terms the hæmorrhagic diseases of infants, or morbus maculosus neonatorum.

In this case there was no jaundice, no signs of infection, and syphilis can be excluded. Post mortem, a great quantity of bloody serum oozed through the nostrils and plugging had to be resorted to in order to stop it.

Holt states that the condition is uncommon, more particularly in private practice. Townsend reports the occurrence in .6 per cent. of all cases in the Boston Lying-in Asylum, and Ritter reported 1.4 per cent. at Prague.

In conclusion, I wish to thank my *confrère*, Dr. McCabe, for describing the condition he found in my absence, and allowing me to embody it in this paper.

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MELANO-SARCOMA OF THE COMMON BILE DUCT CAUSING COMPLETE OBSTRUCTION.

BY

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The case which I wish briefly to present this evening is one of alveolar melano-sarcoma which occurred in the lower portion of the common bile duct. The growth caused complete obstruction of the duct and resulted in the death of the patient four months after the first symptoms appeared.

Clinical History: is as follows: Male, aged 44, was admitted to the M. G. H. under Dr. Shepherd's service, in the spring of 1907. The first symptoms began in May in the form of cutaneous itching, especially of the feet at night. Later, jaundice developed which grew progressively worse. This condition was associated with great weakness and depression and some loss of weight. Dr. Shepherd operated upon the case in July and found nothing to account for the biliary obstruction. A fistula was established which subsequently discharged bile and dark concretions, but at no time stones. The urine always contained bile. The patient died early in September.

Autopsy: Body of a fairly well developed and nourished white adult male. The skin, conjunctivæ and mucous membranes present a deep lemon-yellow discoloration. There is slight *lividity* over the dependent parts. Rigor mortis is present. Pupils: left 4 m.m., right 2 m.m. No œdema. On the left side of the face is a large fluctuating mass which contains a fistulous opening that discharges thin creamy pus. On the right side of the abdomen in the region of the gall bladder there is a linear scar 10 c.m. in length in which are three fistulæ. Bile may be expressed from the larger opening.

Abdominal Cavity: The parietal and visceral peritoneum is deeply bile stained. Appendix 12.5 c.m. in length, retrocæcal and "S" shaped

for its outer third. Mesenteric lymph nodes are not enlarged. Diaphram: left 5th rib, right 5th rib. About the gall bladder are numerous old fibrous adhesions which wall off the site of operation from the greater peritoneal cavity. On separating the adhesions the bladder is found firmly attached to the left parietal wall.

Gall Bladder and Ducts: These were opened and carefully inspected in situ. The bile passage-way from the bladder to the gut describes a course shaped like the figure "S," which evidently has resulted from the adhesions following the cholecystotomy.

The common duct is greatly dilated throughout its extent, and admits readily the index finger. The biliary passages in the liver are also dilated and tortuous. The mucous membrane of the cystic and common ducts, though deeply bile-stained are apparently normal except for a marked fenestration of the inner aspect (the result of long continued distension).

In the lower part of the common duct including Vater's diverticulum the lumen is completely filled with a soft dull black fungoid mass which is intimately associated with the duct wall. At first it would appear as though the mass was altered blood or inspissated bile; however, on more careful observation it is found to consist of innumerable flattened finger-like projections. These tiny fungoid projections separate out distinctly when submerged in water, except at the basal part where they apparently spring from a common bed. The tumour is so soft that a probe is easily passed through it into the duodenum. The Papilla and the oblique passageway in the wall are patent and normal.

The pigmented growth completely fills the ampulla of Vater and extends upward in the common duct for a distance of 2 c.m. The upper and lower limitations of the tumour are sharply defined by the superimposed villous-like projections which overhang the edge as so many closely apposed loops.

A careful search fails to reveal anything in the nature of this tumour elsewhere in the body, though the eye, skin and central nervous system were carefully examined.

Microscopic: Parts of the tumour including the wall of the duct were fixed in Zenker's fluid, alcohol and formalin, embedded in paraffin and stained with eosin-methylene-blue. Mallory's connective tissue, phosphotungstic-acid-Hæmatoxylin, and fibroglia stains were employed for the differentiation of special tissues. The method to determine the presence of iron pigment failed to give results.

The microscopic sections show that the tumour is composed of alveolar masses of large polyhedral cells. The nuclei are oval and vesicular

and the cell protoplasm is filled with large and small brownish-black pigment granules. The cells vary greatly in size and have a well defined alveolar arrangement which apparently springs from the mesothelium of the sub-mucous coat. Long villi composed of these pigment bearing cells push forward between the glands of the tunica propria and project far into the lumen of the duct. The tumour also infiltrates and extends in an irregular manner through the muscular coat. Mytotic figures are fairly numerous. Scattered throughout the growth are many phagocytic cells for blood pigment. The glandular epithelium in places contain melanin granules.

Remarks: This case has a two-fold interest:—First from the histopathological aspect because of its unique situation and the fact that we are dealing with a tumour containing pigment cells far removed from where this type of cell normally exists; secondly, owing to the complete obstruction to the common bile passageway, simulating cholelithïasis, the case is of extreme interest surgically.

The growth, it would seem, is primary in the common duct since the most careful search of the cutaneous surface and central nervous system revealed nothing which would indicate its metastatic nature. It is, however, borne in mind that there is the possibility of a dislodgement at some time of one or more pigment bearing cells from a normal situation such as the choroid, which has subsequently become arrested at a distant point where the cells divide and give rise to a neoplasm. In support of this view we have the well-known example of thyroid metastasis in remote parts of the body though primary growth in the glands escapes the most careful search.

I am fully aware how difficult it is to believe that a pigmented tumour could arise from cells in this location, and I make no attempt at present to explain the occurrence. The most natural criticism would be that the primary locus has escaped the search, which fact is possible and would seem probable in the light of our present knowledge of chromatophora.

This tumour is unique to say the least, and as far as I know, is the first of its kind to be reported. A full account of the case will appear in the literature later.

PANCREATIC CYST.

BY

G. E. ARMSTRONG, M.D.

This case I report because of its rarity and also because of the clinical interest which obtains particularly in regard to diagnosis. The patient, a young man, aged 30, came to my office in October with the request for

an operation on his stomach. On enquiry I found he had been told that he had cancer. The patient was born in Nova Scotia, was a glass-blower by trade, though had worked at other labouring trades. A year ago last April he began to vomit his food and to suffer from distress in his stomach. In July jaundice developed and became quite marked accompanied by dark urine and clay-coloured stools. About this time he also noticed developing in the left hypochondrium a palpable visible prominence which was greater after a meal. He felt better after vomiting. In two or three weeks he recovered from the jaundice and went back to work eating heartily whatever was put before him, digesting his food well and feeling well. In May, 1907, the vomiting again returned and he began to lose weight, something like 75 pounds in five months. About July he was admitted to the Montreal General Hospital under Dr. Lafleur who found this palpable mass in the left hypochondrium which gave the impression of a tense viscus rather than a solid growth. Analysis of the stomach contents showed absence of hydrochloric, lactic and butyric acids. He was under treatment for a time, discharged and readmitted in September again complaining of loss of weight and vomiting every day, in fact could retain but little food, which caused distress, discomfort and distension only relieved by vomiting; did rather better with starchy foods than with solid meals. A test meal withdrawn three hours after gave 7 oz., contained many lumps of undigested food resembling rancid butter. Lactic acid was present in abundance also butyric. Acidity was 4.5; no peptonization when acidified. No free hydrochloric acid.

These findings led to a diagnosis of carcinoma of the stomach. The man developed an unusual desire for operation and in October he was admitted to the surgical wards and I consented to operate, first, because of the extreme loss of weight, more than one would expect in carcinoma; second, the mobility of such a large tumour. It seemed rather odd that this carcinoma should develop to such a size in so short a time and still be as freely movable under the hand as it was with each movement of the diaphragm. Again it was perfectly smooth, not nodular like what one would expect in a carcinoma of that size. An exploratory incision was done and on opening the abdomen in the epigastric region it was rather difficult to make out at first what one had to deal with. The liver, gall bladder and bile passages were palpable and visible; the colon and the small intestines appeared normal. There were no enlarged glands. On passing up over what I supposed to be the stomach I came across this hard, smooth, tense mass covered with dilated veins. It seemed evident

that this was clearly a retroperitoneal condition. I put a needle in and withdraw about 40 oz. of turbid fluid. In withdrawing it I brought the cyst wall out to the surface and thus emptied it. The stomach came into view. It lay below the tumour and was compressed into an organ which looked like the colon and had not at all the appearance of the normal stomach. It was now quite clear that I was dealing with a cyst of the tail of the pancreas, coming forward above the stomach. On examination the fluid was found to be slightly alkaline with a specific gravity of 1008 and to digest albumin. This made it pretty clear as to diagnosis. Of course as Jaksch has pointed out there are other peritoneal fluids which may digest albumin and it is also clear that some pancretaic cyst contents have not always digested albumin.

The cyst was anchored and drained and is discharging very little now. Another interesting feature was that I could not find any evidence of malignancy here. The analysis of the stomach contents made recently showed still absence of hydrochloric acid. The patient has gained from the day of operation up to the present about 38 pounds.

DR. AMRSTRONG, in discussing this case, remarked that there was no history of trauma. The jaundice appeared about the time that the prominence in the epigastrium was noticed and it seemed very natural to associate the one with the other. The gall bladder and passages were normal and there was no evidence of adhesion about the parts, old ulceration, constriction or narrowing and no calculus was felt. It is possible that it pulled over and displaced the duodenum sufficiently to temporarily obstruct the common duct. This may be a possible explanation for the jaundice. The appearance at the operation showed this to be a very hard tense cyst and at first it seemed impossible to get a place free of blood vessels where one could apply retention forceps or insert a needle. Extreme loss of weight is common in pancreatic cyst and enormous enlargement of vessels is also quite common over these cyst walls.

A CASE OF SARCOMA OF THE INTESTINES.

BY

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Sarcoma of the intestine is very rare and this case was only recognised by the pathologist after the operation. The patient was a man, aged 60, who was brought to me from the country with the history that 24 hours previously when riding on a reaping machine he was seized with

sudden pain after a slight jar when going over a rough piece of ground. He went home with some difficult and vomited several times. He was in great pain and Dr. Cooper who was called in recognised the condition as serious and brought him into town. I saw him soon after and he then had all the symptoms of peritonitis; general distension of the abdomen, rigidity of the muscles and great tenderness of the lower zone but nothing could be made out on this account as to the locality of the lesion. Operation was advised and agreed to and he was immediately placed under ether. An incision was made in the median line below the umbilicus and at once there gushed out a quantity of stinking pus with flakes of lymph. This almost filled the abdomen. On examination I found one of the coils of the intestine collapsed and on lifting it out it immediately filled with air. A perforation was found at the base of a diverticulum near the ileo-cœal valve. This diverticulum, however, felt hard and was not like the ordinary diverticulum of the intestines. It was about the size of an almond and near the mesenteric border, and just immediately below it was a pin point opening through which the contents were escaping. I made an elliptical incision and took away the diverticulum, also the pin point opening and sutured the intestine in the ordinary way with Lembert sutures. The abdomen was thoroughly washed out with saline solution and a cigarette drain left in 24 hours. The pulse was never over 100 and the condition very good; temperature rose to 100. He went on to complete recovery. That was on August 10th, 1906 and he is still alive today (January 1908) and in good health with no signs of recurrence. On pathological examination it was found that this little diverticulum was really a small celled sarcoma growing from the wall of the intestine outwards and stretching it at this point rendering it very thin so that the sudden jar received while riding on the reaping machine was sufficient to rupture the thin wall around the growth and allow the intestinal contents to escape. This is a very unusual condition and I have heard of but one other case. The mass was no bigger than the last joint of one's little finger and exactly like a diverticulum though near the mesenteric border. Of course had there been no rupture the tumour would have gone on and extended so it was perhaps fortunate that operation was necessitated at so early a stage of the disease.

THE OPHTHALMO-TUBERCULIN REACTION.

BY

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Within the last year two additional tests for tuberculosis by means of tuberculin have been placed at our disposal, so that we now have subcutaneous injection of the old tuberculin or some of its modifications, the cutaneous scarification and inoculation of the same, known as von Pirquet's test, and lastly, the ophthalmic or conjunctival reaction, known as the Calmette or Wolff-Eisner reaction.

At the meeting of the Berlin Medizinische Gesellschaft, on May 8th and 15th, 1907, von Pirquet reported the results which he had obtained by using tuberculin by the cutaneous method. In the discussion which followed, Wolff-Eisner took the opportunity of placing before the society the fact that, being led on by some experiments as to the hypersensitiveness of the conjunctiva to pollen, in hay fever, he had also been experimenting with tuberculin and its reaction in the conjunctival sac. He had made use of a 10 per cent. solution of the old tuberculin (T. A.), but his conclusions were at that time unformed.

(1) Calmette of the Pasteur Institute at Lisle, reported in June, 1907, the result of putting a drop of 1 per cent. tuberculin in the conjunctiva of tuberculous patients ; among the first being sixteen tuberculous patients who gave a positive reaction and nine controls who did not react. This was the first publication on the test, hence the name, Calmette's reaction; possibly actual priority belongs to Wolff-Eisner.

(2) Citron was the first in Germany to publish any results, and since then a whole host of publications have filled the literature of France, Germany, Great Britain and America. In spite of this fact it is most difficult to come to any accurate conclusion as to the value of the test owing to certain fallacies which may influence the result. These possible fallacies are:

1. Differences in performing the test and judging the reaction.
2. Differences in the tuberculin used, in its preparation, its strength, and its freshness.
3. The difficulty of knowing whether certain apparently healthy individuals who react, are actually tuberculous.
4. Our lack of knowledge concerning the nature of the reaction so that we are unable to allow for other conditions which may modify the test or render it negative.

Calmette in his original communication fearing that the glycerine and bouillon extractives in the old tuberculin would prove too irritating to the eye, precipitated the old tuberculin with alcohol, washed the precipitate, dried it and dissolved it in distilled water 1 to 100. Citron first showed that the elaborate preparation was unnecessary and advised a 1 per cent. solution of Koch's old tuberculin in normal saline or boric acid.

([3]) Eppenstein, indeed, went so far as to show experimentally that a 2 per cent. solution of glycerine was unirritating to the conjunctiva. This difference in the preparation of tuberculin has, however, persisted, so that to-day we find the French school adhering to the Calmette preparation, while the German school uses the unmodified T. A. Undoubtedly some discrepancies in the results published are due to this difference, but another source of error is to be found in the fact that some of the products put on the market as "Calmette's tuberculin," are much too strong (*e.g.*, Höchst). Again, the percentage to be used has not as yet been established, so that while one observer reports tests made with a ([17]) .33 per cent. Calmette's tuberculin, another uses a ([18]) ¼ per cent. T. A. Freshly prepared tuberculin ([10]) is said to be another requisite.

Experience has, however, by this time shown that the most useful strength should be in the neighbourhood of a 1 per cent. solution. With the dried tuberculin (Calmette) it is not necessary to go higher, but with the T. A. the use of 2 per cent. solution after the 1 per cent. fails is allowable. In children and patients likely to react excessively, it is wiser to start with a ½ per cent. solution. In America up to the present the test has been made along the lines indicated by Calmette, *i.e.*, with the dried tuberculin.

That differences in the performance and interpretation of the reaction must occur, is certain. Two important points are, to be sure that the conjunctivæ are healthy before inoculation, and to see that the tuberculin is properly distributed about the sac and not winked or wiped out. A very real difficulty lies in proving apparently normal individuals, who react, to be tuberculous. As may be seen from all statistics, a certain proportion of healthy individuals react. Are these tuberculous? Our only way of proof lies in making use of a hypodermic of T. A. (or by subsequent history or post mortem examination). The former has to a very large degree confirmed the test ([14]) ([15]) ([17]) ([18]), as may be seen from our own results. Further, the cutaneous reaction of von Pirquet has, according to Wolff-Eïsner and Stadelmann ([16]), also confirmed the ophthalmo-reaction. Both the cutaneous and subcu-

taneous tests, however, give a higher percentage of reactions than the ophthalmo-reaction as occurring only where an active lesion is present, whereas both other tests react where a "healed" or inactive lesion exists. It is noteworthy that a tuberculin injection will cause the ophthalmo-reaction even if performed subsequently in a healthy subject (5) (16). Most animal work (4) has been performed along these lines, but apparently with others, as in our experience, animals do not lend themselves to this test.

This brings us to a consideration of the nature of the test. It depends evidently on a hypersensitiveness of the conjunctiva in tuberculous individuals whereby it reacts to an agent (tuberculin) which is unable to cause a reaction in healthy subjects. This tendency to reaction or hypersensitiveness evidently depends on the formation by the tubercle bacillus of antibodies in the organism. It is therefore not unexpected to find that tuberculin subcutaneously forms these same antibodies, and that an inoculation in the eye sensitizes it to a second test. An interesting and important point here raises itself. Why do certain cases fail to react when, as we shall presently see, they can be proven tuberculous? A definite answer is wanting, but the probability is, perhaps, as follows:

According to our own studies and those of many others most cases where reactions fail in tuberculous subjects are either moribund or rapidly advancing cases (2) (14) (18). Such cases frequently fail to react to tuberculin subcutaneously. Apparently the organism is overwhelmed by the toxines, no antibodies are formed and no reaction can take place. Certain cases will, however, react one day and fail another, or *vice versa*. If it be not amiss to borrow Wright's phraseology, may not this depend on the presence of the positive or negative phase.

Consideration of these facts leads some observers to assign a prognostic value to the reaction (8). A prompt, smart reaction speaks for tuberculosis, but also for a good reacting or resisting power, the absence of a reaction in an individual known to be tuberculous speaks for loss of resisting power (2), *i.e.*, a bad prognosis. The significance of a delayed reaction (over thirty hours) probably means the presence of some old, latent focus.

In our series of cases the test was performed as follows. The patient's conjunctivæ were first examined by pulling down the lower lids. These being normal, or any difference being noted, a single drop (.025 cc.) of a ½ per cent., 1 per cent. or 2 per cent. solution was placed by means of a pipette in one conjunctival sac and well distributed, care being taken that it was not pressed out by winking or rubbing. The reaction begins in three to six, or six to twelve hours later, with a dilatation

of the pupil, slight lachrymation and reddening of the caruncle; usually in twelve to twenty-four hours it is at its height. It lasts from thirty-six to forty-eight hours or longer; severe cases have been reported lasting a week or more. Swelling of the lids and photophobia may result. We have adhered to the general scheme of recording results, viz.:—

0 No difference in either conjunctiva.
? Slight difference, especially in caruncle.
+ Distinct redness of caruncle and palpebral conjunctiva.
++ Distinct redness of palpebral and bulbar conjunctiva with lachrymation and formation of fibrin.
+++ Œdema of lids and photophobia. (Chemosis.)

Through the kindness of Dr. Baldwin, of Saranac Lake, N.Y., we have made use of a tuberculin identical with that recommended by Calmette (1), but in our later cases we have used a 1 per cent. and 2 per cent. solution of T. A. in .9 per cent. saline solution (2) placed in tubes and boiled seven minutes. The differences noted were slight, and now in favour of one, now of the other. In general the unmodified took longer to cause a reaction, though in one case this was evident within two hours. In another it did not appear till after thirty hours. We have had no very severe reactions, and only in one or two instances have we had to use an eye wash. Beyond a feeling of grit in the eye in a few cases no pain was complained of in any instance. In no case could we be certain that the test caused a constitutional reaction as is reported by writers.

According to our observations the reaction is a distinct inflammation, a conjunctivitis with formation of pus and fibrin; no pathogenic bacteria were isolated (McKee).

With few exceptions the tests have been made in the medical and surgical wards of the Montreal General Hospital, and we desire here to express our thanks to the members of the attending staff, who have interested themselves in this work and to those of the resident staff who have assisted us in the following reactions.

We have made the test in 156 individuals, in many cases twice, as it is our custom to begin with a ¼ per cent Calmette or 1 per cent. T. A., and should no reaction follow to confirm it by a 1 per cent. C., or 2 per cent. T. A. in the other eye after forty-eight hours interval. The cases include pulmonary tuberculosis, pleurisy with effusion and various surgical aspects of tuberculosis. The controls include a number of healthy individuals, but consist for the most part of patients suffering from other disease.

TABLE I.

Diagnosis.	Total Cases	Tbc. Bacilli present	P.M. Confirmatory	Hypo. T.A. positive	Microscopic positive	Clinical positive	Reaction					Tuberculin				Remarks
							+	++	+++	?	0	Calmettes Modified		T.A. Unmodified		
												½ p.c.	1 p.c.	1 p.c.	2 p.c.	
Pulmonary Tuberculos.	31	17	1	3	....	10	16	8	3	....	4	9	10	10	2	Of the 4 negative cases 3 were moribund and 1 very adv'nced
Pleurisy Effusion	10	3	....	....	....	7	5	1	....	2	2	2	2	5	1	
Tuberculous Peritonitis	2	....	....	....	2	....	1	1	....	....	....	1	1	....	....	
Tuberculosis of the hip	5	....	....	....	....	5	1	3	....	....	1	3	....	1	1	
Tuberculosis of the knee	3	....	....	1	....	2	3	....	....	....	....	1	2	....	....	1 positive case gave no reaction to 5 m.g., T.A.
Tuberculosis of the elbow	1	....	....	....	....	1	1	....	....	....	....	....	....	1	....	
Tuberculous Osteomyelitis incl. caries of the spine	8	....	1	2	....	5	6	....	....	....	2	3	5	....	....	1 very old was negative also one very weak.
Tuberculosis of the finger	1	....	....	....	1	....	....	1	....	....	....	....	1	....	....	
Tuberculosis of the kidney	4	....	....	1	3	....	2	2	....	....	....	2	2	....	....	
Tuberculosis of the testis.	1	....	....	....	1	....	....	....	....	....	1	....	1	....	....	
Tuberculous adenitis	3	....	....	....	3	....	3	....	....	....	....	1	1	1	....	
Fistula in ano	1	....	....	....	....	1	....	....	1	....	....	1	....	....	....	
Total	70	20	2	7	10	31	39	16	4	2	10	23	25	18	4	
Cases doubtfully tuberculous.	7	....	....	2	....	5	1	....	....	....	6	2	1	2	2	
Cases of normal individuals and non-tuberculous diseases	79	....	3	13	....	63	1	3	1	....	74	8	51	5	15	
Total	156	....	....	....	....	....			66		....	33	77	25	21	

It was possible to confirm our diagnosis of tuberculosis in some cases by finding bacilli, animal inoculation, postmortem examination, the examination of tissue removed at operation or by the use of a hypodermic of tuberculin. Classified thus, we find that:—

Thirty-nine cases of tuberculosis (confirmed) gave thirty-four positive and five negative reactions, or 87.4 per cent. of reactions. Of the five not reacting, four were advanced or moribund cases.

Thirty-one cases of tuberculosis (clinical) gave twenty-four positive and five negative and two doubtful reactions, *i.e.*, of seventy tuberculous cases 85.7 per cent. reacted.

Our controls, on the other hand, including cases of carcinoma, typhoid, acute rheumatism, fractures, osteomyelitis, and various minor surgical lesions show that of seventy-nine cases, apparently not tuberculous, five gave a positive reaction, or 6.3 per cent.

In seven doubtful cases, one reacted, one was questionable and five were negative.

As yet very few figures are at hand to show the value of this reaction in surgical cases, it is, therefore, interesting to note that in

Twenty-nine surgical cases of tuberculosis (clinical), twenty-five were positive and four negative, an error of 13.7 per cent.

Thirty-one pulmonary cases, twenty-seven positive, four negative; all advanced or moribund cases.

In ten cases of pleurisy with effusion, six were positive, two negative, and two doubtful.

In accordance with the scheme outlined above, forty-one cases may be described as +, nineteen as ++, and four as +++, and two as doubtful.

In the cases tested with the Calmette preparation, fifty-one were tuberculous, with six failures (12 per cent.), and fifty-nine were non-tuberculous, with four reactions (6.8 per cent.); whereas of those tested with T. A., twenty-six were tuberculous, with five failures (20 per cent.) and twenty were non-tuberculous, with one reaction (5 per cent.). The number of cases is, however, too small to permit of any accurate conclusion.

In twenty-three cases we have controlled our findings with T. A. subcutaneously. In thirteen non-tuberculous, both ophthalmo and hypodermic methods were negative, in seven tubeculous cases both were positive. In two instances we got an eye reaction, in one a hypodermic reaction but no eye reaction. The first two are to be explained as we used an old solution, but the last case is still an enigma.

In our table it will be seen that five of our controls reacted (6 per cent.), and ten of our tuberculous cases failed to react (14.3 per cent.). For our controls we can come to no other conclusion than to regard them as probably having some slight focus of tuberculous disease indiscoverable to ordinary methods. Of the tuberculous cases which did not react it is noteworthy that of the ten, five were moribund or advanced or very anæmic patients. For one case, however, of tuberculosis of the testis we can offer no reason for failure to react. Perhaps a stronger solution should have been tried.

It has been brought forward that the reaction is not specific (°), as cases of syphilis, actinomycosis, typhoid and acute rheumatism (Kraus) have responded to it. In our experience but one case of typhoid gave a doubtful reaction, and he had at the time some conjunctivitis, so that our evidence would negative that point.

Before taking up a brief review of the literature on this test it may be well to note that of late there has been a certain reaction among ophthalmologists against it. Apparently certain eye conditions of conjunctivitis, iritis, corneal ulcer, keratitis and sclero-keratitis, not to mention tubercular disease of the eye, have been rendered worse through its use. For the present, therefore, these should serve as contra-indications to the test. They are its only contra-indications.

In the accompanying table it will be seen that we have collected 1,219 cases (from the literature chiefly of France, Germany and United States), where this test has been carried out. There are undoubtedly many omissions, but also, perhaps, some repetitions. Of this number 1,675 cases were tuberculous, with 1,426 positive and 249 negative reactions (14.8 per cent. error). 557 were questionable or suspected, with 289 positive and 269 negative results; while 1,987 cases were not tuberculous, with 169 positive and 1,818 negative reactions (8 per cent. error).

We have already spoken of the fallacies of such statistics, but the percentage of error keeps very close to 14 and 8 per cent. in each series. While an open mind is still the only attitude to maintain in reference to this reaction, we feel that a test so easy of performance, which has so few contra-indications, is so simple in its interpretation, and where a prompt, sharp reaction occurs, so certain an index of tuberculosis, deserves a wider and more extensive trial.

TABLE II.

	Total	Tbc.	+	—	Tbc. ?	+	—	Not Tbc.	+	—	
Baldwin	136	54	52	2	23	9	14	57	17	40	Collected by Schroeder and Kaufmann. (13)
Kobler	174	169	161	8	5	5	0	1	1	0	
Schenk and Seyffert	100	28	27	1	20	15	5	52	26	26	
Citron (July, 1907)	90	31	25	6	14	11	3	45	1	44	
Andeoud	31	13	12	1	3	1	2	15	—	15	
Eppenstein	247	85	60	25	89	38	51	73	4	69	
Cohn	310	86	60	26	32	23	9	192	10	182	
Calmette, etc.	198	111	108	3	—	—	—	87	1	86	
Lenhartz	112	38	33	4	63	23	40	11	4	7	
Métraux	68	15	14	1	11	9	2	42	2	40	
Franke-Katjen	51	6	6	—	12	9	3	33	4	29	
	1885	974	859	115	284	146	138	627	80	547	
Calmette, Belton, Painblan and Petit	115	63	63	—	—	—	—	32	....	52	
Citron	81	25	19	6	11	8	3	45	1	44	
Grasset and Rimbaud	31	13	12	1	3	—	3	15	1	14	
Derchaud	21	8	8	—	—	—	—	13	—	13	
Prouff	18	12	12	—	—	—	—	6	—	6	
Des-Plats	9	4	4	—	—	—	—	5	—	5	
Helipee and Hul	22	14	14	—	—	—	—	8	—	8	Collected by Smithies and Walker. (5)
Grillet	9	7	7	....	....	....	....	2	....	2	
Desbonnets	4	2	2	....	....	....	....	2	....	2	
Letulle	46	19	19	—	—	—	—	27	....	27	
Montagnon	27	14	12	2	5	5	—	8	—	8	
Aubaret and Magne	15	11	11	—	4	3	1	—	—	—	
	401	185	176	9	28	21	7	188	2	186	
Floyd and Hawes	231	52	38	14	92	26	46	101	16	85	
Smithies and Walker	242	29	29	6	15	10	5	198	2	196	
Blum	250	26	21	5	5	3	2	219	31	188	
Schroeder and Kaufmann	77	48	43	5	9	4	5	20	12	8	
Wolff-Eisner and Stadelman	276	64	34	30	20	12	8	192	—	192	
Schenk	100	8	8	0	29	14	15	63	9	54	
Levy	330	41	35	6	54	32	22	235	6	229	Collected by ourselves.
Graupp	100	61	44	17	23	11	12	16	—	16	
Citron	233	115	86	29	18	10	8	100	6	94	
Eisen	110	82	53	29	—	—	—	28	5	23	
	1945	526	391	135	245	122	123	1172	87	1085	
Total all series	4219	1675	1426	249	557	289	268	1987	169	1818	

(1) Calmette. Presse Médicale, June 19, and July 13, '07.
(2) Citron. Sitzung der Berlin Med. Gesellschaft, 24 VII, '07; Berlin Kl. Woch., 33, '07; Deutsch Kl. Woch., 3, '08.
(3) Eppenstein. Med. Klinik, '07, 36.
(4) Calmette, Breton and Petit. Compt. rend. d. l. Soc. Biol., T. 63. '07, 28.
(5) Smithies and Walker. J. Am. Med. Ass., Jan. 25, '08.
(6) Baldwin. N. Y. State Journal, Oct., '07.
(7) Schenck and Seiffert, Munch. Med. Woch., 47, '07.
(8) Lemaire. Soc. d. Biol., Oct., '07, 12 and 19.
(9) Glehn. Deutsch Med. Woch., '08, 8.
(10) Gaupp. Deut. Med. Woch., '08, 7.
(11) P. Eisen. Beitrage z. Klin. d. Tuberkulose, '07, Hf. 4.
(12) Kohler. Deut. Med. Woch., '07, 50.
(13) Schroeder and Kaufmann. Munch. Med. Woch., '08, 4.
(14) Blum, *ibid.*
(15) Schenck. Deutsche Med. Woch., '08. 2.
(16) Wolff-Eisen and Stadelman. Deut. Med. Woch., '08, Jan, 30.
(17) Floyd and Hawes. J. Exp. Med., '08, Feb.
(18) Levy. Deut. Med. Woch., '08, 3.
(19) B. M. J., Oct. 19, '07.

The Rockefeller Institute for Medical Research purposes to award for the year 1908-1909 a limited number of scolarships and fellowships for work to be carried on in the laboratories of the Institute in New York City, under the following conditions:

The scholarships and fellowships will be granted to assist investigations in experimental pathology, bacteriology, medical zoölogy, physiology and pharmacology, physiological and pathological chemistry and experimental surgery.

They are open to men and women who are properly qualified to undertake research work in any of the above mentioned subjects and are granted for one year.

The value of these scholarships and fellowships range from eight hundred to twelve hundred dollars each.

It is expected that holders of the scholarships and fellowships will devote their entire time to research.

Applications accompanied by proper credentials should be in the hands of the Secretary of The Rockefeller Institute not later than April 1st, 1908. The announcement of the appointments is made about May 15th. The term of service begins preferably on October 1st, but, by special arrangement may be begun at another time.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

EDITED BY

J. GEORGE ADAMI, WILLIAM GARDNER,
GEO. E. ARMSTRONG, H. A. LAFLEUR,
A. D. BLACKADER, JOHN McCRAE,
G. GORDON CAMPBELL, F. J. SHEPHERD,
F. G. FINLEY, J. W. STIRLING

ANDREW MACPHAIL, MANAGING EDITOR.

Remittances, advertisements or business communications are to be addressed to the Montreal Medical Journal Co., Box 273; all others to the Managing Editor, 216 Peel Street, Montreal. All communications intended for insertion in this Journal are received with the understanding that hey are contributed exclusively to this Journal. A limited number of reprints of articles will be furnished to authors at cost price, if a request to that effect accompany the manuscript.

VOL. XXXVII. APRIL, 1908. No. 4.

THE UNDESIRABLE IMMIGRANT.

There are many different circumstances arising every day in Montreal which drive home upon our minds the fact that we are getting a great deal of moral and physical riff-raff from Europe. This is not a reflection upon the decent and healthy immigrant, but upon the laxity of rule that allows the "undesirable" to land. With the question of financial fitness we have not to do at present, although we do know a case where an inland bank telegraphed a large amount of money to Quebec to be loaned to immigrants to pass the portal. What we are here concerned with is the question of a medical examination that shall be sufficiently searching to detect advanced tuberculosis, and mental incapacity, and such important disorders. We are in the position of having seen in a few days in Montreal, three cases: two of these were far gone in consumption at the time of their landing, and are at the public charge at present. The third is a cripple, of such a great degree of deformity as to be quite unsuited to anything but a life of immobility in a tailor's shop, where he will be certain to end his days at no far-distant time. The country has as good a right to reject such immigrants as has the insurance company to refuse to insure them. This is no question of sentiment, for we yield to no one in our admiration for the cripple who makes a brave fight against his disabilities; but

it is a question of who are to be the fathers of the future children of Canada, and if we hope to do our duty by the country, it is part of our duty to see that we have as great a freedom as possible from preventible disease.

It is not beyond our province to say that the medical inspection of immigrants at our ports is not adequate: the steamship and railway companies are eager to pass their passengers on as rapidly as possible, and there seems no possibility of having them kept long enough to allow a thorough examination of them to be made; the solution does not seem to lie upon this side of the water, but upon so rigorous an examination on the other side that such passengers would not be allowed to begin their journey. Upon first cabin steamship passengers this ought not to be obligatory, unless it were plainly evident that an "undesirable" was paying the extra money to travel among a class to whom he obviously does not belong.

We know that this will cost money, for it will mean the employment of thoroughly capable physicians who will devote adequate time to the work; to undertake such stringent measures will also exclude the chance traveller who comes to Canada "in search of health"; in the case of a consumptive, travelling in Canada is not good treatment, and his lot will be no worse, rather better. If we could keep a hundred consumptives a year out of Canada, such a movement would financially justify itself, if such justification were needed.

Dr. F. A. L. Lockhart, 38 Bishop Street, chairman of the Obstetrical and Gynæcological Section of the Canadian Medical Association, has furnished us with the following memorandum: "As you are doubtless aware, the Canadian Medical Association is to meet in Ottawa on June 9th, 10th, and 11th, and a large attendance is expected. Several new sections have been added, among others one devoted to Obstetrics and Gynæcology. This being a new departure, it is sincerely hoped that all who are especially interested in either of these subjects will do their best to make the meeting of the section a success and so justify its formation. In order to attain the above result, it will be necessary to arrange the programme with care, and the committee having this in hand would like to have the names of all those wishing to contribute papers or case-reports handed in as soon as possible. While a certain number of most interesting papers have already been promised, there is room for a few more, and it is hoped that intending contributors will kindly send in their names, together with the

titles of their papers, either to the secretary, Dr. D. Patrick, 4174 St. Catherine Street, Westmount, or to myself."

THE McGILL MEDICAL JOURNAL CLUB.

The annual meeting of this club, which exists for the purpose of supplementing and aiding the Medical Library of McGill University in the matter of scientific journals, was held on February 7th, in the rooms of the Montreal Medico-Chirurgical Society, at five p.m. Dr. E. W. Archibald, the President, being absent, Dr. A. A. Robertson took the chair. There were present, Drs. Robertson, Nicholls, Morrow, and Klotz. The Secretary, Dr. A. G. Nicholls, presented a brief report as follows:—

Mr. President and Gentlemen,

Your officers, consisting of Drs. Archibald, Robertson, Morrow, and Nicholls, who constitute the executive of the McGill Medical Journal Club, beg to report a satisfactory year. They have met at irregular intervals as business has called them together, and consider that the affairs of the club are now running smoothly and harmoniously. This is in large measure due to the efficient assistance of Miss Charlton, the Librarian of the Medical Faculty, to whom our hearty thanks are due. Our membership is now 59, or about the same as last year, and our financial position, as the books of the Treasurer will show, is sound.

We have now on our list twenty-one magazines, consisting of some of the leading journals in the various departments of medicine. These are at all times at the disposal of the members. Your committee has been conservative in its views, and with an eye to possible contingencies, has kept well within its income. Accordingly, we have added during the year only two journals, Biochemisches Centralblatt, and Comptes Rendus de la Société de Biologie de Paris. These will probably be increased in the future. The only unusual expenditure that has been authorized was a small amount to replace some twenty numbers of current magazines which were damaged in the late fire at McGill, in order that our fyles may be complete. The current journals are now to be found upstairs in the Redpath Library, where a special room in connection with the temporary quarters of the Medical Faculty Library, has been assigned for their accommodation. Members can get all information in regard to them by applying to Miss Charlton. The committee is at all times open for suggestions as to journals to be acquired,

which will be carried out, in so far as the general welfare and the financial position will permit.

A. G. NICHOLLS,
Secretary.

The election of officers for the year 1908 was proceeded with and resulted as follows:—President, Dr. E. W. Archibald; Vice-pres., Dr. A. A. Robertson; Sec., Dr. A. G. Nicholls; Treas., Dr. Campbell Howard. Eexecutive Board:—The officers, Drs. Morrow, Klotz and Chipman.

It was decided to inaugurate a more active policy in the direction of attempting to interest more physicians in the object of the Society and thereby increase its usefulness. A better method of collecting the annual dues was discussed.

The treasurer's statement is appended.

TREASURER'S REPORT.

Dr.		Cr.	
Balance on hand November 1st, 1906	$ 58.96	Journals	$ 74.66
Subscriptions	98.00	Stamps, stationery, etc	3.00
Interest	1.63	Printing	7.00
		Typewriting	1.10
		Special Delivery	.55
			$ 86.31
		Balance on hand	72.28
	$158.59		$158.59

ASSETS.		LIABILITIES.	
Balance on hand	$ 72.28	Journals unpaid to December 31, 1908	$ 87.25
Subscriptions due December 31	40.00	Excess of assets over liabilities	$ 25.03
Total	$112.28		$112.28

WILLIAM S. MORROW,
Secretary.

Reviews and Notices of Books.

THE HISTORY OF THE STUDY OF MEDICINE IN THE BRITISH ISLES. The Fitz-Patrick Lectures for 1905-6 delivered before the Royal College of Physicians of London. By NORMAN MOORE, M.D., Cantab., Fellow the Royal College of Physicians, Physician to St. Bartholomew's Hospital. With eleven collotype plates. Oxford: at the Clarendon Press, London, Edinburgh, New York and Toronto; Henry Frowde.

The first of these lectures treats of Medical Study in London during the Middle Ages, and of John Mirfield, a physician, who lived in London in the reign of Richard III. The second lecture treats of the reading

and general attainments of physicians from the foundation of the Royal College of Physicians, in 1518, to the beginning of the eighteenth century. In the third and fourth lectures the author has shown how that part of medicine which consists in the precise observation of patients grew up in England, Scotland, and Ireland; and he has particularly considered the effect of the works of Mayerne, Glisson, and Sydenham upon that study in England, and the influence of Boerhaave upon it in Scotland and Ireland. In the Appendix he has printed from the manuscript in Mayerne's hand in the British Museum his notes on the health of James I, and the report on Queen Henrietta Maria which he drew up in 1641. These facts are taken from the preface to the book.

A considerable body of literature has grown up around the history of medicine, particularly in the German tongue, but it is only in recent years that English physicians have awakened to the interest which there is in the subject. Dr. Clifford Albutt applied his scholarship to the subject in an address which he delivered at the St. Louis Congress in 1904. This was republished the following year by Messers. Macmillan & Co., under the title of "The Historical Relations of Medicine and Surgery, to the End of the XVI Century." Dr. Norman Moore concerns himself with the history of medicine in England, and his book is the result of much diligent study at first hand. Not the least interesting part of the book is the transcription of Mayerne's Notes upon the health of James I. He must have been a difficult patient. We have it on the authority of his physician that, "The King laughs at medicine and holds it so cheaply that he declares physicians to be of very little use and hardly necessary. He asserts the art of medicine to be supported by mere conjectures and useless because uncertain." One who knows much of the history of medicine in those days will not be inclined to dispute the correctness of this observation.

The case report of Henrietta Maria, wife of Charles I, is also reproduced. It gives a new light upon that unhappy period, and yet it is questionable in how far one is justified in exposing to the world information which has come to the physician in the exercise of his calling upon the mental and physical condition of his patients, however eminent they may be. From reading this book one gets the impression of being down amongst the roots of English medicine which has flourished so amazingly during the past fifty years.

THE OPSONIC METHOD OF TREATMENT. B. R. W. ALLEN, M.B., B.Sc. (Lond.). H. K. Lewis, London, 1908.

In this book the author gives a brief sketch of the origin and growth of opsonic treatment from the time of Jenner in 1798, and points out

what opsonins are, their methods of demonstration in the blood, their formation, the effects of the injection of a bacterial vaccine, and describes other methods of raising the opsonic index. The technique of determining the opsonic index is very carefully gone into, as is the preparation of the vaccine, etc., and its diagnostic and prognostic value in health and disease is illustrated by cases. The employment of tuberculin with the management of tuberculous cases is then taken up and the remaining chapters are devoted to the management and treatment by the opsonic method of cases infected by the staphylococcus, streptococcus, pneumococcus, gonococcus, micrococcus catarrhalis, bacillus coli, and many other organs, as also in eye infections.

THE NERVOUS AND MENTAL DISEASE MONOGRAPH SERIES. Published by the Journal of Nervous and Mental Disease Publishing Co, under the editorship of SMITH ELY JELLIFFE, M.D., and WM. A. WHITE, M.D.

This series will consist of short monographs, translations, and minor text-books on subjects related to these specialties. It is purposed to issue them from time to time as the material becomes available. The editors are to be congratulated on this first issue, and one feels certain that if the future numbers keep up to the standard set, this series will have a merited success. The first of the series is a monograph entitled, "The Outlines of Psychciatry," by W. A. White, M.D.

This work is not expected to take the place of the larger text-books and no claim is made for exclusiveness or completeness, it is merely intended to afford a helpful guide to Dr. White's students so that they can follow his lectures easily and more satisfactorily. In spite of this unassuming preface this work should be read with profit by many students who may not have the pleasure of listening to Dr. White. The work opens with a short account of the nature of the human mind and the fundamental psychological processes, for the purpose of providing a proper foundation for what follows, placing the student in possession of certain general facts so that he will be better able to orient what he may observe.

The book is well written and reads easily, and can be heartily recommended to the student and young physician as giving a good working knowledge of this branch of medicine. After reading it carefully one feels disappointed that the neuroses, hysteria and psycasthenia have not been taken up as fully as the more marked forms of mental disease, but one can appreciate the fact that the limitations of such a work as this is intended to be, precludes this.

C. F. R.

PROTOZOA AND DISEASE. By J. JACKSON CLARKE. 138 pages and 219 illustrations. Modern 8vo. Price, $2.25. Published by Ballière, Tindall & Cox; Canadian Agents: J. A. Carveth & Co., Ltd., Toronto.

This is an interesting book and one worth reading. It is in many things, as its sub-title, "Part II.", indicates, a continuation of "Protozoa and Disease, Part I." by the same author (published in 1903 by the above named firm). The two books should really be read together.

In the first chapters of the volume under discussion, the author treats mainly of recent advances in our knowledge of tropical diseases and of the pathogenic flagellata. This part of the work is largely a compilation and, unfortunately, the author has, occasionally, not read the most recent papers nor gone to the original publications for his information. There are, consequently, minor errors in his statements.

The latter chapters, pages 76 to 136, are devoted to a rediscussion of the nature of certain rounded bodies in sarcomata first described some years ago by the author as probable sporozoa. Although the author expressly states his endeavour to make it quite clear "where observation ends and interpretation begins," the reader will find it especially difficult to do so in this part of the work.

It seems strange that only the briefest allusion is made to the work of those who see in the "cancer bodies" described by the author and others, extraordinary resemblances to certain normal constituents of reproductive cells in animals.

J. L. T.

TEXT-BOOK OF OPHTHALMOLOGY. By DR. ERNST FUCHS, Professor of Ophthalmology in the University of Vienna. Authorized Translation from the Eleventh German Edition. By ALEXANDER DUANE, M.D., Surgeon to the Ophthalmic Institute, New York. Third Edition, with 441 illustrations. Philadelphia, London and Montreal: J. B. Lippincott Company, 608 Lindsay Building, Montreal; Charles Robertson, Manager for Canada.

The translation of the last edition of this superb work of Fuchs's has been long looked forward to. Dr. Duane has certainly done his duty very creditably. It is almost impossible to make any criticism of a standard work so thoroughly recognized as being trustworthy and accurate. The author's character for accuracy is thoroughly borne out in this edition. The advances made since the publication of the last edition have been recognized and the subject matter brought thoroughly up-to-date. Dr. Duane has added a certain amount of new matter in

the sections on functional examinations, motor anomalies, refractions and operations; some of which certainly increase the value of the book. As a specimen of book-makers' art there is little left to be desired. The work cannot be too highly recommended to the general practitioner as well as to the specialist.

J. W. S.

THE PRACTICAL MEDICINE SERIES; NERVOUS AND MENTAL DISEASES. By HUGH T. PATRICK, M.D., Professor of Neurology in the Chicago Policlinic, and CHARLES L. MIX, A.M., M.D., Professor of Physical Diagnosis in Northwestern University Medical School. Series 1907. Chicago: The Year Book Publishers, 40 Dearborn Street.

The volumes of this series are always welcome, and the ten of which it is composed will form at the end of the year a valuable library. One who reads them will be well informed upon medicine and its progress. The present volume will prove entirely satisfactory to the student or practitioner.

PERSONAL HYGIENE IN TROPICAL AND SEMI-TROPICAL COUNTRIES. By ISAAC WILLIAM BREWER, M.D., Member of the American Society of Tropical Medicine. Philadelphia: F. A. Davis Company. Price, $1.00.

With the advent of the United States into the Tropics the people are faced by the problems with which the English have had to deal for several centuries. There is now a large population of American citizens in Panama, the Philippines, and Cuba which demands special treatment and instruction in hygiene. Dr. Brewer has written a small treatise for those about to live in the tropics, which is born of experience and should prove invaluable. Every detail of the daily life is considered, and suitable directions are given for any condition which is likely to arise.

PROGRESSIVE MEDICINE. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson College, Philadelphia; assisted by H. R. M. LANDIS, M.D., Assistant Physician to the Out-patient Medical Department of the Jefferson Medical College Hospital. Lea & Febiger, Philadelphia and New York, 1908. $6 per annum.

This volume, dated March 1st, contains 278 pages, and has the following table of contents:—Surgery of the Head, Neck and Thorax, Charles H. Frazier, M.D.; Infectious Diseases, including Acute Rheumatism and Croupous Pneumonia, Robert B. Preble, M.D.; The Dis-

eases of Children, Floyd M. Crandall, M.D.; Rhinology and Larynology, D. Braden Kyle, M.D.; Otology, Arthur B. Duel, M.D.

Four times a year it is our privilege to call attention to Progressive Medicine, and we do so again with increased pleasure.

MATERNITY. By HENRY D. FRY, M.D., Sc.D., Professor of Obstetrics, Medical Department of the Georgetown University. New York and Washington: The Neale Publishing Co., 1907.

With a certain lack of reticence this book is dedicated to the author's mother. The association of the two is unusual. The author cites the record of his critical apparatus, which includes a good deal of miscellaneous reading from the "Bible" to the "Travels of Marco Polo." This might well have been taken for granted, as an acquaintance with these books is not an unusual accomplishment amongst civilized men. Nothing is left unsaid. The author appears to have told us all he has ever read, though it is not new or especially interesting. He relates the obstetrical experience of that portion of the Semitic race which occupied lower Asia, recorded in the Hebrew scriptures, as if he had come upon it for the first time.

MINOR MEDICINE. A Treatise on the Nature and Treatment of Common Ailments. By WALTER ESSEX WYNTER, M.D., B.S., London. Physician to the Middlesex Hospital. Price, $1.75. Toronto: D. T. McAinsh & Co., 1908.

Nearly all medicine is minor, and the average physician has to do with discomfort rather than with disease. The physician of to-day is less well equipped to deal with those ailments which to him are trifling than was his predecessor of thirty years ago. The art of medicine has suffered at the hands of the science. Dr. Wynter has written a book which elevates into due importance those slight maladies which quite properly fall to the lot of the practitioner. The opening sentence—"for who hath despised the day of small things"—gives the note of the theme. The book is *written*, not pieced and patched. It is the work of a man with a mind, and not merely an aggregation of words out of a dictionary. To read it purifies the taste.

MODERN ELECTRO THERAPEUTICS. By FREDERICK FINCH STRONG, M.D., Instructor in Electro-therapeutics at Tuft's College Medical School, Boston. New York: Rebman Company, 1123 Broadway.

An author who begins a chapter of a book on electro-therapeutics with the statement that "the human organism may be compared to a symphony orchestra," cannot expect to be taken seriously—by the present

reviewer, at least. A writer requires to have certain qualifications just as a maker of shoes does. One of the commonest fallacies in the United States is that the possession of a degree in medicine qualifies a man for authorship. This book, contrary to the author's expectation, will serve to increase still further the distrust of the profession in electricity as a therapeutic measure.

PRACTICE OF MEDICINE FOR NURSES. By GEORGE HOWARD HOXIE, A.M., M.D., Professor of Internal Medicine in the University of Kansas. Philadelphia and London: W. B. Saunders Company, 1908.

The frontispiece of this book is a gruesome spectacle. It represents the results upon the feet of wearing ill-fitting shoes, and is not absolutely germane to nursing. Many of the other pictures are equally unpleasant, but those of nurses and house-surgeons are attractive. One more book has been added to the "literature" of nursing, which has now grown to a considerable bulk.

THE TREATMENT OF UTERINE RETRO-DEVIATIONS. By G. A. CASALIS, M.B., Gynæcological Surgeon to the Victoria Cottage Hospital, Wynberg. T. Maskew Miller, Cape Town, Pretoria and Bulawayo, 1906.

This is the first book on medicine which we remember to have seen coming from South Africa, and, as such, we give it good welcome. An excellent body of medical writing is growing up in that distant region and it gives one the impression that the writers are extremely well educated. This book of 200 pages is entirely creditable to the author and to the publisher.

AIDS TO SURGERY. By JOSEPH CUNNING, M.B., B.S., F.R.C.S., Eng.; Surgeon to the Victoria Hospital for Children. Second edition. London: Baillière, Tindall & Cox; Toronto: Carveth & Co. Price, $1.25.

This is a book of 400 pages, the latest in this familiar series. Its usefulness for the purpose for which it is intended is obvious, and the author's somewhat acerb apology might well be spared.

TRANSACTIONS OF THE ASSOCIATION OF AMERICAN PHYSICIANS. Twenty-second Session. Held at Washington, D.C., May 7th, 8th and 9th, 1907. Volume XXII. Philadelphia: Printed for the Association, 1907.

This is a splendid record of the work of this association and will do much to increase the esteem in which American medicine is held.

MEDICAL LABORATORY METHODS AND TESTS. By HERBERT FRENCH, M.A., M.D., Oxon., Assistant Physician, Guy's Hospital. Second Edition. London: Ballière, Tindall & Cox, 8 Henrietta Street, Covent Garden, 1908. Toronto: Carveth & Co. Price, $1.50.

This little book is unusually well printed and bound. In its 150 pages it contains all which it is essential for a student to know. It is a sure and safe guide through the laboratory. The plates are excellent.

Medical News.

THE CANADIAN HOSPITAL ASSOCIATION.

The Second Annual Convention will be held in The Parliament Buildings, Toronto, on Easter Monday and Tuesday, April 20th and 21st, 1908. The following is the programme:—

Monday, April 20th, 2 p.m.—President's Address, Miss L. C. Brent, Supt. Hospital for Sick Children. "How to Deal with Tuberculosis as a Social Problem," Dr. W. J. Dobbie, Supt. Weston Sanitarium; discussion by Drs. Gordon and Kendall, of Gravenhurst, and Dr. Holbrook, Mountain Sanitarium, Hamilton. "The Milk Supply, Dr. Helen MacMurchy, Editor, *Canadian Nurse*; discussion by Dr. Robertson of Ottawa, and Miss Sheppard, Berlin. "Fumigation," Dr. A. D. Macintyre, Supt. Kingston General Hospital; discussion by Miss Miller, Lindsay.

Appointment of nominating committee.

8 p.m.—Reception by Miss Louise C. Brent, President, at the Nurses' Residence, Hospital for Sick Children.

Tuesday, April 21st, 9.30 p.m.—"Contagious Diseases in Relation to Hospital Management," Dr. Chas. Sheard, Medical Health Officer; discussion by Miss Brent and Miss Matheson. "Some Observations on European Psychiatric Hospitals," Dr. C. K. Clarke, Supt. Toronto Hospital for Insane; discussion by Dr. Ryan of Kingston, Dr. Hurd of Johns Hopkins Hospital, Dr. R. Bruce Smith and Dr. D. C. Meyers. "The Hospital and the Public," Del T. Sutton, Editor *National Hospital Record*; discussion by J. W. Flavelle, Esq., LL.D., W. T. White, Esq., J. Ross Robertson, Esq., and J. W. Atkinson, Esq.

Report of nominating committee.

2 p.m.—"A New Typhoid Hopper," H. E. Webster, Supt. The Royal Victoria Hospital, Montreal. "The Proper Length of the Period of Study for Nurses," Dr. H. M. Hurd, Supt. Johns Hopkins Hospital, Baltimore; discussion by Miss Patton, Miss Tolmie and Miss Chesley. "The Nursing of Incurable Patients," Miss M. M. Grey, Supt. Hospital for Incurables.

A pleasant occasion recently was the dinner given to Dr. F. J. Shepherd by the Anatomical Staff, past and present, to mark the twenty-fifth year of his occupation of the Chair of Anatomy in McGill University. It was held at the Mount Royal Club on Saturday, March 28th, and the following were present: Dr. F. G. Finley, Dr. H. S. Birkett, Dr. J. M. Elder, Dr. J. G. McCarthy, Dr. J. A. Henderson, Dr. W. I. Bradley (Ottawa), Dr. J. J. Ross, Dr. A. E. Orr, Dr. R. A. Wesley, Dr. W. G. Reilly, Dr. H. M. Church, Dr. A. T. Bazin, Dr. A. Mackenzie Forbes, Dr. C. K. P. Henry, Dr. W. E. Nelson, Dr. J. G. Browne, and Dr. J. A. Nutter.

The 30th annual meeting of the American Laryngological Association will be held in Montreal on May 11th, 12th and 13th. The meetings will be held in the Ladies Ordinary of the Windsor Hotel, and will be open to physicians. A special feature will be a splendid display of accessory sinus X-ray plates, collected from several sources, as well as a pathological exhibit.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

VON HEINEKE. "On the so-called Spontaneous Rupture of the Rectum." *v. Bruns Beitr. Z. klin. Chir.*, Bd. L. H. 2, 1906.

Von Heineke describes a case in a 30-year old man who, by lifting a heavy weight, caused a rupture of the front wall of the rectum 17 cm. from the anus. No previous disease of the rectal wall could be made out. In the eight other previously published cases there had been some previous disease of the rectal wall.

Diverticulitis and Peri-diverticulitis.

We are dealing here with the so-called "Acquired Diverticula" of the large intestine and one must bear in mind that the condition has not any relation to Meckel's Diverticulum. Acquired diverticulum is a condition affecting the colon from the splenic flexure to and including the rectum. They are outward projections of one or all of the intestinal coats, comparable to the finger of a glove. If the projection comprises all the coats it is a true diverticulum, but if consist of the mucosa alone it is termed a false diverticulum. They may occur at

any spot on the circumference of the bowel wall, although some observers think they occur most frequently at the mesenteric border, owing to the weak spots caused by the entrance of the large mesenteric veins. They occur occasionally into the appendices epiploicæ. They are found fairly frequently at the P. M. table, namely, about once in 1,000 cases. They usually occur in people past middle age, and are supposed to be induced by chronic constipation. They may persist through life simply as diverticula, empty or containing a fæcal concretion, without in any way affecting the patient's general health, but they may at any time become the seat of an inflammatory process of varying seriousness. This process may result in a firm inflammatory mass which obstructs the lumen of the bowel and which is almost always diagnosed and treated as a carcinoma. At other times the process causes a general peritonitis, while at other times the process forms a large abscess, which, if untreated, may rupture intraperitoneally or come through the abdominal wall, or may even rupture into the bladder. In the last two cases there almost always results a persistent fæcal fistula.

The clinical symptoms of "diverticulitis," the term by which inflammation of these projections is known, are attacks of abdominal pain, general at first but soon becoming localized to the left lower quadrant, and these attacks are often associated with constipation, but the stools never contain blood. Later, as described above, obstruction, a mass or general peritonitis may develop. The treatment, of course, varies with the condition of the process at the time the patient presents himself. If the lesion is small and localized, excision of the affected portion of the bowel is indicated, and the same measures must be adopted in cases of persisting fæcal fistula. The treatment of an abscess or of a peritonitis is the same as when it occurs from other causes.

NYROP. "Studies on Stomach Operations in Benign Cases." *D. Z. f. Kl. Ch.*, Bd. 87, 1907.

He reviews fifty-four cases of gastro-enterostomy, where possible the posterior operation with a short loop, always with suture, save once, with the Murphy button. One case died from peritonitis coming from a stitch, one from pneumonia, and one from a vicious circle. Thus, the total mortality is 5.6 per cent., and he counts the operation mortality 3.7 per cent. Of these cases there was an absolute indication for the operation in forty-three, while in the remaining cases it was only partial. Of these twenty-nine were completely healed, seven were improved, four remained unhealed as to the primary condition, and three later died. The causes of the absence of betterment were as follows:—Peptic ulcer

of the jejunum, spontaneous gastropexia, secondary narrowing of the anastomoses, chronic twisting of the small intestine loop, diarrhœa, forcing of bile or pancreas juice into the stomach, peritonitis, bleeding from the wound-surface into the stomach, peritonitis, and the pre-operative causes of general weakness, great dilatation of the stomach, and pneumonia.

As to the peptic ulcer in the reported cases one finds it almost three times as often in the anterior as in the posterior, in spite of the fact that the posterior are by far the most frequent operations. This ulcer lies on or very close to the anastomoses. He thinks that pulling by adhesions, or too short a loop predispose to the formation of this ulcer.

The time between the operation and the clinical appearance of the peptic ulcer is from ten days to eight years. It may perforate acutely, causing a peritonitis, or slowly, causing an inflammatory tumour. At times they heal with a second operation. Before he considers the dangers of gastropexia he considers ordinary gastroptosis: First, gastroptosis with retention due to kinking of the pylorus or due to narrowing of this outlet, and, second, gastroptosis without retention, wholly without symptoms (or where the symptoms, if present, may be ascribed to a nervous condition). Where marked nervous symptoms are present in cases of gastroptosis without retention, he agrees with Strümpell that the nervous condition is primary, and that an operation is worse than useless. In the other cases, he is in favour of a gastroenterostomy, in preference to other operations, as gastropexia interferes with the usual muscular movements of the stomach. He notes that although the operation does not cause the dilated stomach to shrink, in the vast majority of cases it cures the symptoms. As to the so-called "vicious circle," he agrees with Peterson that this is due to a pre-operative persistent and prolonged stomach dilatation, and should be classed with cases of acute idiopathic stomach dilatation. He also quotes Mikulicz, who states that a spur formation is not the cause of the vicious circle, but rather that the vicious circle is the cause of the spur formation.

The other mentioned dangers are unimportant and easy of treatment. He refers to the fact that gastroenterostomy for a supposed stomach ulcer, may permit a carcinoma to develop unsuspected. He states that where an ulcer is found at the pylorus, it always should be resected, to prevent a later developing cancer.

Narath's Modification of Talma's Operation for Hepatic Cirrhosis.

As is well known, the first procedure suggested by Talma for the relief of ascites in cirrhosis, was the suture of the liver to the dia-

phragm; this was later changed to suture of the omentum to the anterior abdominal wall. However, since the operative mortality in both these is at the very lowest, 10 per cent., and at the same time a favourable result is by no means certain, Narath has suggested a new method which can easily be carried out under local anæsthesia, and is therefore almost entirely free from operative mortality, and at the same time, he claims it is followed by a much larger percentage of cures. His method consists in making an incision in the anterior abdominal wall on the one or other sides, and in bringing out a piece of the omentum and suturing it just underneath the skin. One must be careful to suture the deeper abdominal wall closely enough around the omentum to prevent the formation of a hernia, but not so closely as to produce strangulation of the omental veins. He claims the subcutaneous veins are by far the best suited to form a good collateral circulation and claims that in one or two weeks after the operation, one sees marked dilatation of the superficial veins and a corresponding relief from the ascites.

DOERING. Contribution to Kidney Surgery. *D. Z. f. K. Ch.*, Bd. 87. 1907.

Doering discusses mainly hydronephrosis on the basis of eleven cases of aseptic, and two cases of infected hydronephrosis. None of his cases were double sided and none were in a horseshoe kidney. He states that the cause may lie in faulty development of the pelvis, ureter or the kidney vessels, or in later-coming inflammatory changes. He states that complete disappearance of the kidney parenchyma is very rare.

The chief interest attaches to the treatment to be adopted and one might state here that plastic operations on the ureter for the relief of this condition are only very rarely feasible. Therefore, the point to be decided is whether to first drain the kidney and do a later nephrectomy (for complete cure from this almost never occurs), or to remove the kidney at the first operation. He cites the views of several German surgeons on this: Diedel declares for primary nephrectomy, Trendelenburg for primary nephrectomy, Czerny for primary nephrectomy, Kronlein, Garre and Schmeiden the same. Israel, Eiselsberg and Clairmont prefer primary nephrotomy. The author decides for primary nephrectomy as Kuster first recommended: on pyo-nephrosis also, if possible, a primary nephrectomy.

JACOBSTHAL. "On the so-called Adolescent Thickening of the Tuberosities of the Tibiæ." *D. Z. f. Kl. Ch.*, Feb., 1907.

He reminds us that apart from the X-rays these cases would always be diagnosed fractures of the tuberosities. These cases were first described by Osgoode and later by Schlatter. They explained these cases

as lath-like fractures of the bill-like projections of the upper tibial epiphysis. These projections come from the epiphysis about the thirteenth to the fifteenth year, grow downward over the front surface of the tibia as a tongue protruded over the lower lip, which later unites with a bony mass growing forward from the tuberosity of the tibia. Towards the diaphysis is always a cartilage layer, which about the twentieth year becomes bony. Here is always a weak spot that is easily fractured. The author thinks this holds for some but not for all of the cases.

Winslow thinks these to be cases of rarefying osteitis with ossifying periostitis and so of inflammatory nature. The author thinks this or some trophic change in the epiphyseal line to be the cause. The disease usually lasts a year, but the prognosis is favourable, as chiselling off the mass gives cure.

FREEMAN. "Early Operations on Nerves in Ischemic Paralysis." *T. Am. S. Ass.*, 1907, v. 25.

Freeman states that Volkman's ischemic paralysis usually occurs in children owing to too tight bandages or splints. He thinks that although the primary trouble is in the muscles, these, by their fibroid contraction, later press on the nerves, injuring them and so hindering their own recovery. Where the nerves are affected sensory and trophic disturbances appear. The median is usually nipped when passing through the pronator radii teres, the ulnar in its course between the two portions of the flexor carpi ulnaris just below the inner condyle, and the posterior interosseous in traversing the fibres of the supinator brevis below the elbow.

At the operation the nerves are freed, transported to a new position if necessary, and the results have been excellent.

SAUERBRUCH. "Resection of the Chest Wall with Plastic Closure." *D. Z. f. K. C.*, Jan., 1907.

Sauerbruch refers first to his previous operations in his chamber, where he operates under a reduced pressure equal to 8 to 12 mm. of mercury. He emphasizes the avoidance of pneumothorax, to lessen the danger of infection. He states that the authors who think there is not much danger in acute pneumothorax are not supported by animal experiment or by clinical experience. He cites the work of Amberger who, in fifty-one cases of chest-wall resection had seventeen deaths immediately. He states that pneumopexia or tamponnade are not satisfactory. He states that Noetzel has experimentally shown that avoidance of pneumothorax is the best safeguard against infection.

He brings two new cases of excision of the chest wall for carcinoma of the breast. In both cases he covered the defect by bringing across the other breast. One case died shortly afterwards of metastases, but the other is well six and a half months afterwards. He uses two layers of sutures to make the wound air-tight.

BARTLETT.. "A Simple Operation for Stone in the Pelvic Ureter." *Z. f. Kl. Ch.* n. 22 s. 621, 1907.

Bartlett refers to cases where the stone is in the pelvic ureter. He makes a wound parallel to and at the outer border of the rectus, goes down to the peritoneum, but then works around the peritoneum till he reaches the ureters, which, he states, is easily done. Then he palpates the stone, and, holding it between the fingers, he incises the ureter, squeezes out the stone, puts in a small drain to the wound-site, which he leaves in for five or six days, and closes the remainder of the abdominal wound. He states the results have been good in every case, as there has been no urinary extravasation.

SULTAN. "Experiences with Rectoscopy." *D. Z. f. Kl. Ch.*, Feb., 1907.

Sultan cites cases showing the value of high rectoscopy or sigmoidoscopy, but also cites a case where the patient suffered from chronic catarrh of the colon and when on carefully inserting a rectoscope for 20 cm. a perforation ensued, which the author thinks was due to the air pressure on a diseased bowel. He thinks this is a danger always to be kept in mind.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON AND HOWARD.

ARTERIOSCLEROSIS.

THAYER AND FABYAN. "Studies on Arteriosclerosis, with Special Reference to the Radial Artery."

FREMONT-SMITH. "Arteriosclerosis in the Young." *The American Journal of the Med. Sciences,* Dec., 1907; Feb'y, 1908.

The material upon which the observations of Thayer and Fabyan were made, consisted of sixty-one cases, varying in their ages from fifty-six days to eighty-three years. These studies were undertaken in order to establish justifiable inferences with regard to the general arterial tree, or special central vessels, to be drawn from the condition of the radial artery. In answering the question, is the radial artery ever

palpable, these observers say that in the great majority of the cases observed over twenty years of age, it was so found. They divide their case, clinically, into those which were not palpable, or palpable and not regarded as thickened, and those in which the vessel appeared to be distinctly thickened. In the first and second decades none of the arteries were considered as thickened; in the third and fourth decades seventy-seven per cent. were regarded as essentially normal, but in the fifth decade, sixty-three per cent of the arteries were regarded clinically as thickened vessels. The arteries which were regarded clinically as thickened, showed in the majority of cases anatomical thickening of the intima. The article concludes with the following summary:—

In old age, a thickened radial artery represents conditions which are normal, and to be expected not only in the peripheral, but in the central vessels, while an unduly thickened radial at an earlier age may mean one of two things: (1) The vessel has been subjected to unusual and exceptional strain, or, (2) It is a vessel which, from inherent weakness, or other individual circumstances, has been unable to cope with conditions which might ordinarily be regarded as normal. When a thickening of a radial artery is *unduly* marked, similar changes occur in the intima of the mesenteric artery and aorta.

The article by Fremont-Smith affords a review of the subject, from the historical point of view, and contains numerous quotations from many careful observers, showing that arteriosclerosis in the young is by no means uncommon. So recently as 1905, it was confessed by Remlinger, while discussing this condition from the standpoint of etiology, that the cause of diffuse arteriosclerosis in the young was unknown. Syphilis, of course, has always been thought to account mainly for these cases, yet in a large number this factor is not to be found.

More and more it would appear that pathologists are coming to regard the acute infections, typhoid, pneumonia, scalatina, etc., as playing a large part in bringing about this condition. Thayer and Brush, Flexner, Symnitzky and Wiesel have published papers upon the influence of such infections, describing definite microscopic changes in the media and intima.

HEWLETT. "The Interpretation of the Positive Venous Pulse." *The Journal of Medical Research,* 1907, Vol. XVII, p. 119.

The writers's conclusions are as follows:—

1. A positive wave on the venous pulse during ventricular systole may be due to at least three different causes. (*a*) Simultaneous contraction of the auricles and ventricles, (*b*) tricuspid insufficiency, (*c*) paralysis of the auricles.

2. Simultaneous contraction of the auricle and ventricle causes or tends to cause the V-wave to disappear from the tracing, owing to auricular diastole.

3. Tricuspid insufficiency produces a large V-wave which appears abnormally early. In marked cases there is a gradual ascent in the tracing from the auricular wave to the summit of the V-wave.

4. In absolutely irregular pulses the auricles have ceased to contract. The positive venous wave of early ventricular systole is produced by the contraction of the ventricle and is transmitted unchanged through the motionless right auricle to the veins of the neck. Normally this wave is taken up by the dilating auricle.

5. Tricuspid insufficiency does not necessarily accompany auricular paralysis, and when it does so its diagnosis is difficult for the reason that in both conditions the V-wave appears early, owing to the excess of blood in the right auricle.

CEREBRO-SPINAL MENINGITIS.

FLEXNER AND JOBLING. "Serum Treatment of Epidemic Cerebro-Spinal Meningitis." *The Journal of Experimental Medicine*, January, 1908.

This report is based upon the application of a diplococcus antiserum, prepared in the horse, to the treatment of cases of cerebro-spinal meningitis occurring in New York, Philadelphia, Cleveland, Castalia and Akron (Ohio), Edinburgh and Belfast. Forty-seven cases of meningitis were treated with the antiserum and thirty-four (34), or 72.3 per cent. recovered. The records show that of the 13 fatal cases, 4 were either fulminant in type, or, the patient's case was so extreme, that death occurred within a few hours of the injection of the antiserum. Deducting these four fatal cases one has the percentage of 79.9 per recoveries, and 21.1 per cent. deaths.

In reading this report one cannot fail to be impressed with the open mindedness of the observers. They are evidently searching for an effectual way of dealing with this dreadful disease, medicinal treatment of which seems practically ineffectual.

It is claimed for this new treatment that on giving the antiserum in many cases there followed a drop in the temperature, a return of the reflexes, and the general severity of the symptoms abated considerably. After describing a favourable course followed by several cases thus treated, one finds the following remark: "Whether this is more than a coincidence cannot be decided now," or again, "The critical dis-

appearance of the severe symptoms after the lumbar puncture and the injection of the serum would seem to bear some relation to each other." Yet another quotation may be made: "Lumbar puncture and injection of the antiserum having been made, the patient's condition changed quickly for the better, but the final recovery was fluctuating and general. The precise value of the serum injections must therefore remain doubtful."

The writers state their opinion regarding the value of the serum as a therapeutic agent in epidemic meningitis in a few words. "No one could be less convinced of the final fact of its value than we are; on the other hand, we believe that the data at hand warrants a wider trial of the antiserum, particularly as no other, and better means of combating the disease is available."

The manner of action of the serum is a matter of some speculation, but the observations made show "that the antiserum exerts a definite and injurious influence upon diplococcus in the cerebro-spinal fluid through which its multiplication is restrained, and it is rendered more subject possibly to phagocytic inclusion and digestion, at the same time that it is deprived of its capacity to grow outside the body on culture media."

The process of immunization of the horse from which the serum was taken occupied a year or longer. The details of method need not be described in retrospect.

The dosage of the antiserum is by no means fixed, and in looking over the records one finds that it has varied from 5 cc. to 15 cc., while the total amount administered to the individual patients has varied from 10 to 220 cc.

The mode of administration, etc., cannot be better described than by quoting the general instructions given by these authors.

"The antiserum should be kept in a refrigerator until it is to be used; when it should be warmed to body temperature before it is injected. The antiserum is to be introduced directly into the spinal canal after the withdrawal of cerebro-spinal fluid by means of lumbar puncture.

The quantity of antiserum to be used at a single injection should not exceed for the present 30 cubic centimeters." ..... "The injection of the antiserum should be repeated every twenty-four hours for three or four days or longer." ..... "The evidence at hand indicates that the earlier in the course of the disease the injections are made the better the results." ..... "Until the antiserum is proven to be of

value or of no value in the treatment of epidemic meningitis, its manner of action should be carefully observed and recorded so that a definite decision may be reached as quickly as possible."

COPPS AND LEWIS. "Observations on Certain Blood Pressure Lowering Reflexes that Arise from Irritation of the Pleura." *The Amer. J. of Med. Sciences,* December, 1907.

It is in connexion with the operation of thoracentesis that the experiments of Copps and Lewis were carried out to explain, if possible, the alarming symptoms of unconsciousness, convulsions, and occasionally death, which supervene upon what usually seems so trivial an operation, and which is generally explained by a lowered blood pressure.

When those cases explained by pulmonary œdema, accidental hæmorrhage, pneumothorax, emboli or thrombi in the heart or pulmonary arteries or in the cerebral arteries are excluded, there still remains a considerable number of cases of sudden death, in which no anatomical lesion can be found to explain the collapse. These observers have experimented on dogs, inducing pleural effusions, introducting oil into the pleural cavity, and have irritated the pleura in various ways, making in all fifty-one experiments, in the course of which careful observation was made upon the blood pressure and respirations. These observations are represented graphically in several instances. They also tested the effects of intravenous injections of adrenalin, in cases where the blood pressure was unduly lowered. In two instances, this injection seemed to save the life of the animal.

Besides these observations upon animals, there are recorded eight observations in pleurisy in man, with special reference, as before, to alteration in blood pressure during aspiration. The conclusions are, in substance, as follows:

1. Aspiration of oil from the pleural cavity of healthy dogs causes little or no change in the arterial pressure.

2. Aspiration of inflammatory exudate, from the pleural cavity of dogs with acute pleurisy often causes a more marked fall in blood pressure, depending more on the degree of trauma or irritation of the inflamed pleura, than on the amount of exudate withdrawn, or the rate of withdrawal.

3. Irritation of the visceral pleura, of healthy dogs, by mechanical, thermal and electrical means, and by certain chemicals produces little or no effect upon blood pressure, except over the roots of the lungs, where mechanical and electrical excitations produce long strokes of vagal type.

4. The effect of irritation of the parietal pleura, needs further investigation. The common drop of blood pressure, and disturbance of respiration, occurring when the trocar is forced through the chest wall into the cavity, is probably due to injury of the parietal pleura.

5. .....

6. These reflexes conform to two types, which, as a rule, occur singly, but may be combined. (*a*) The cardio-inhibitory type, in which the heart is slowed and the pulse tracings make violent excursions, with a great range between systolic and diastolic pressure. Respirations are also usually slowed, and may be inhibited. This type of reflex, when it occurs alone is seldom fatal; (*b*) The vasomotor type, in which the pulse tracings show a steady rapid decline of pressure without any great difference in systolic and diastolic pressure, and frequently terminate in death. .....

7. The cardio-inhibitory reflex is central, because it is prevented or stopped by cutting both vagus nerves in the neck. Atropine, in a dosage of 1 milligram paralyzes the cardio-inhibitory fibres and destroys the reflex.

8. The vasomotor (dilator) reflex may be central or peripheral. If central, the afferent impulses reach the medulla by way of the thoracic sympathetic, the white rami and the cord, and not by the vago-sympathetic cord. If peripheral, the reflex goes from the pulmonary fibres to the pulmonary plexus, thence to the thoracic sympathetic nerves, and downward through the splanchnics to the cœliac and other plexuses in the abdomen. Adrenalin is the physiological antagonist to the vaso-dilator reflex and is often life-saving .....

9. These types of reflexes occur also in man during operative procedures upon the inflamed pleura. The cardio-inhibitory type is manifest by a slow intermittent pulse with great difference between systolic and diastolic pressures; the vaso-motor type by a steady fall in the blood pressure, and by a pulse that grows steadily weaker, until it cannot be felt.

10. For emergency use in case of falling blood pressure and symptoms of collapse, adrenalin intravenously is indicated. Atropine is of little service, and may even do harm.

11. The instrument used in thoracentesis should not irritate the visceral pleura any more than is absolutely necessary. The trocar is preferable to the needle ..... Great care should be employed during the drainage of an empyema. ..... Swabbing the pleural surface is attended with danger.

W. F. HAMILTON.

BYERS, W. G. M. "The Ocular Manifestations of Systemic Gonorrhœa with Reports of Cases of this Nature." Royal Victoria Hospital Reports. Vol. II. pt. 2. February, 1908.

The reviewer has had an early opportunity of studying this contribution and has been impressed by a number of features in the preface, in addition to the text.

The work, as Byers very justly remarks, is more than a mere compilation of the literature upon this subject; it is a clear and comprehensive review of all that has been heretofore attempted upon metastatic forms of gonorrhœa affecting the eye. All the authentic reports of this nature have been carefully synopsized, and those which could not be clearly regarded as belonging to this type rigidly excluded. After tabulating the sections the author has critically reviewed them seriatim and arrived at certain definite conclusions. Doctor Byers refers to a number of cases met with in his own practice, and these, with a pathological study of gonorrhœal iritis, add to the value of the work from the point of view of originality. Some of the principal features in the writer's conclusions are as follows:

The early French and British writers were the pioneers in the development of our knowledge of gonorrhœal ocular metastases. From the first, gonorrhœal iritis was uninterruptedly recognized by the profession; but after 1850 the general practictioners alone continue to believe in a metastatic conjunctivitis. The specialists influenced especially by the work of Piringer, went to the opposite extreme and accepted only the theory of direct infection; but they have been again forced into recognizing metastatic conjunctivitis through the bacteriological investigations which have followed Neisser's discovery. The occurence of numerous other conditions in the eye, and the phenomena which gave rise to the old theory of "retropulsion," by which was meant an outbreak of inflammation in one part as the result of its suppression in another, have been made easier to understand through the better appreciation of the systemic phases of gonorrhœa of recent years.

Systemic gonorrhœa most commonly occurs in males, in those cases in which the posterior urethra and the contiguous structures are involved; but nothing definite is known in regard to the factors which underlie the undoubted predisposition of certain individuals to this condition.

The accumulating pathological evidence seems more and more, to show that the gonococci themselves, and not their free toxines or the secondary or mixed infections, are rsponsible for the local manifestations.

Metastatic inflammations of the eye, of gonorrhœal origin, are marked, in general, by uncertainty and irregularity as regards the time of their occurence, the extent to which the parts are involved, the severity of their symptoms, and their course and behaviour; by their close association with manifestations of the disease in other parts of the body; and by a marked tendency to relapse, and to recur with fresh gonorrhœas.

Ocular inflammations are often the first manifestation of systemic gonorrhœa, and the writer holds that they frequently form the sole expression of this condition.

Patients with systemic gonorrhœa should be treated as those actually suffering from an infectious disease; and, as there are grounds for thinking that gonorrhœal metastases pick out points of lessened resistance, excessive use of the eyes, while the systemic infection is in progress, is to be deprecated.

Metastatic gonorrhœal conjunctivitis is a well established clinical entity. The figures of Fournier and of White in regard to its frequency have been often misquoted; but it will probably be oftener met with now that it has gained for itself a wider recognition. It occurs at any time during the course of a systemic gonorrhœa, but apparently more often than the other eye conditions as an initial manifestation. The infection is almost invariably bilateral, and both eyes are usually simultaneously involved. The objective appearances, and the subjective symptoms differ little, if at all, from those of any of the so-called acute "catarrhal" inflammations of the conjunctiva. The discharge is typically slight in amount, and almost always mucoid in character. Pure cases run their course in two weeks; but in thirty per cent of the patients the inflammation is complicated by affections in other coats of the eye. Some of these, at least, are of the nature of deep-seated metastatic inflammations which throw light on the true nature of the conjunctivitis. Relapses occur either alone, or, more often, in association with affections of other parts of the globe.

Though it is impossible, at the present time, to determine its exact mode of development, a keratitis occurs in association with systemic gonorrhœa which is typically of a multiple and superficial nature, and commonly symmetrical in character, and central in situation.

The deep-seated congestion sometimes observed in metastatic conjunctivitis is often only an expression of an inflammation of the interior structures of the globe, actually present or in process of development. The cases of pure sclero-conjunctivitis, which apparently do

occur, ought to be differentiated from metastatic conjunctivitis, and classed by themselves.

In all cases of so-called iritis the pathological process is by no means limited to the iris, but extends at least to the adjacent division of the uveal tract.

The writer recommends discarding the words iritis, and substituting the terms mild or severe irido-cyclitis, the better to express the character and extent of the changes known to be present in these cases.

There are no figures to show what part the gonococcus plays in the production of the inflammations of the uveal tract, viewed collectively; but, taking the statistics for iritis as an index, it would seem that the percentage of cases, attributable to this organism, varies as the result of differences in the social and hygenic condition of the places in which the statistics are collected.

While the gonococcus apparently seeks the vascular coat of the eye as its seat of predilection, the exact relative frequency with which the various structures of the globe are visited by gonorrhœal metastases remains to be determined. Likewise, no definite idea can, at the present time, be formed of the usual extent, duration, and severity of the inflammations of the uveal tract, or of numerous special features of these conditions. Writers, generally, have been too loose in their nomenclature, and too many reports are lacking in details and exact descriptions essential to a determination of these points.

Arranged according to types, one finds that all the common forms of uveal inflammation have been attributed to systemic gonorrhœa, though the statements of Fournier in regard to the frequency of serous cyclitis (aquo-capsulitis) are not borne out by a study of the literature.

Generally speaking, the uveal affections show a tendency to be double-sided in the first as compared with the second and later attacks, and to relapse, and to recur with fresh gonorrhœas. They precede, or follow, or break out simultaneously with other manifestations, or form the sole expression of the systemic infection. They have no special features, except that swellings of any kind in the iris tissue are never observed. Gelatinous exudations are more an indication of the severity of the inflammations than of their origin. An associated metastatic conjunctivitis is suggestive. The purulent forms, which often show no sharp line of demarkation from the plastic, are marked by an extraordinary tendency to recovery.

Metastatic gonorrhœal inflammations of the optic nerve and retina commonly take the form of a diffuse, and scarcely measurable neuro-retinitis, associated, at times, with considerable retinal œdema. Byers

has noted, that when the nervous apparatus of the eye is solely involved the affection is bilateral, but when it is implicated along with the uveal tract the neuritis is unilateral in character. Pathological investigation favors the blood-vessels rather than the lymph spaces as being the principal route for the infection. The prognosis must be guarded, though, generally speaking, the outlook is good.

The cases of dacryoadenitis, which have been attributed to systemic gonorrhœal infection, conform to what we know of inflammation of the lacrimal gland in general, namely, that while the cases caused by direct extension are generally unilateral and go on to suppuration, those produced by metastases are usually bilateral in character and end in resolution.

In reading through the study one is impressed by the fact that these deductions and conclusions have been arrived at only by persistent and conscientious observation and application. The clinical features are not the only valuable points brought out in the work; if only for presenting a complete and reliable bibliography upon this rather obscure subject Byers deserves the gratitude and appreciation of all interested in the theory and practice of ophthalmology.

F. T. T.

BIRCH-HIRSCHFELD. "Optic nerve disease in connection with diseases of the posterior accessory inuses of the nose." *Grafe's Arch.*, May, 1907.

During the past few years the close relationship existing between the nasal cavity and the orbit have become the subject of much investigation, with the result that many lesions occurring in the eye and its adnexa have been traced to co-incident affections of the nose. Birch-Hirschfeld records the histories of four cases: in the first there was a relative scotoma followed by an absolute scotoma and exophthalmos; there was inflammation of the antrum, ethmoid and sphenoid, originating from an alveolar abscess, the inflammation finally extending to the superior orbital fissure causing paralysis of the oculo-motor and abducens. Oedema of the orbit was the cause of the exophthalmos. In the second case there was a central scotoma which rapidly improved upon removal of the sinus trouble, the third was due to acute empyema of the ethmoid perforating into to the orbit; the relative scotoma which existed disappeared upon evacuating the pus; in the fourth case there was a neoplasm in the sinus extending into the orbit which called for exenteration of the orbit. The conclusions drawn are: 1st. That inflammatory affections or neoplasms of the posterior ethmoidal cells can spread to the orbit and optic nerve producing early and severe damage, to the visual acuity and even blindness. 2nd. Visual disturbance may first appear

as a central scotoma with intact peripheral field. 3rd. Because of the difficulty in diagnosing affections of the sinuse and the posterior ethmoid and sphenoid cells and the great danger to life and vision, the early demonstration of this central scotoma can be of the greatest significance.

4th. The differential diagnosis between toxic and infections optic neuritis and a disease of the optic nerve from an affection of the posterior ethmoidal cells would rest upon (a) unilateral nature of the condition although it is sometimes bilateral (b) the relatively acute development of the visual disturbances and its progressions to an absolute scotoma. Anatomically the cause of the central scotoma is an isolated disease of the pupillo-macular fibres behind the entrance of the vessels. It consists of an œdema of the optic nerve, swelling and proliferation of the ganglion cells and a pronounced degeneration of the nerve fibres. Venous stases of a circumscribed area, besides a toxic injury to the nerve fibres has to do with its origin and reaction.

T. R. Torak. "The Treatment of Ocular Tuberculosis and Tuberculin." *Arch. Ophthalmology,* 1907.

After mentionning the various operative procedures for the relief of ocular tuberculosis, Torak gives his own experience of the treatment of 16 cases by tuberculin in the eye clinic at Budah Pest. Tuberculin T. R. was used, the first injection was 1-1000 m.g. and was then slowly increased. The majority of patients were treated by the ambulatory method. Of the 16 cases 8 were cured. 4 showed marked improvement and in 2 cases there was no results.

Bruckner. "Experience with Koch's Tuberculin." *Arch. Ophthalmology,* September, 1907.

Tuberculin was used in 38 cases, 53 injections being made with old tuberculin and 152 with tuberculin T.R. T.V. was injected deeply into the muscles in the inter scapular region, no local reaction resulting. T.R. was injected subcutaneously in the forearm and was followed by sharp reaction lessening in intensity as the solutions were made more concentrated. Brückner attributes this reaction to the glycerine water used in diluting T.R. Abscess formation was never observed. In 35 cases where T.R. was used for diagnostic purposes 17 showed a general reaction. Twelve acute cases of iritis and irido-cyclitis were treated and two gave a positive general reaction while in fourteen chronic cases a positive reaction was observed in eleven. The majority of cases in which the clinical picture suggested tubercular diseases of the uvea, reacted positively to the injection, but one has to remember that the reaction may be due to tubercular foci elsewhere in the body hence the

reaction to tuberculin is not an absolutely positive proof of tuberculosis of the eye, the only positive proof is a local reaction to the tuberculin in the diseased organ itself and this was observed in three cases. Brückner considers that ocular tuberculosis is generally secondary to other tubercular foci.

CHAS. STEADMAN BULL, M.D. "Some of the Rarer Ocular Lesions associated with Gout and General Lithemia." *Ann. Ophthal.* April, 1907.

Gout is due to the accumulation of uric acid in the blood. Before an acute attack the urine may show a diminution in uric acid but after the attack the excretion may be excessive. High blood pressure and gout go together. Arterial sclerosis is responsible to each for its causation. Intestinal fermentation is generally responsible for the acid state. The lithemic dyscrasia is the frequent cause of conjunctivitis, œdema of the eye lids, choroiditis, retinitis, neuritis and affections of the ocular muscles. Some of these ocular lesions precede acute gouty attacks elsewhere and when these latter have occurred the eye lesion promptly disappears. As an example, in conjunctivitis (in which there is but little secretion and local treatment is of no avail) the eye attack lasts a week and is then succeeded by an explossive inflammatory attack of arthritis in the toes, ankles or wrist joints. The œdema of the eyelids when it occurs involves all four lids. The lids are sometimes hard and dense but following the outburst of an acute gouty attack elsewhere the œdema disappears. The external rectus is the muscle most frequently involved in affections of the ocular muscles. The paralysis is generally transient clearing up rapidly choroiditis. Retinitis and optic neuritis are the results of degenerated arteries and veins and high blood pressure occuring in advanced lithemia. The treatment has to be largely dietetic.

J. W. S.

OTOLOGY.

UNDER THE CHARGE OF DR. BIRKETT.

ROBERT BARANY. "The Physiology and Pathology (*Functional Examination*) of the *Semi-Circular Canals* in *Man*." *Deuticke*, Leipzig und Wien., 1907.

Under the above title Bàràny his recently published a brochure which represents an attempt to set forth the recent work on the labyrinth in a form available for the practising otologist.

The aim of the author, as stated in his preface, has been rather to give a working basis for routine clinical examination than to discuss

the various hypotheses by which nystagmus, dizziness and other symptoms which follow labyrinthine stimulation are to be explained. Although this statement explains the sketchy outline of the historical and physiological side of the subject, I think that a more extensive discussion of this section would have been a better introduction to the work which follows. The clinical application of these methods is of such recent date that to all but those who have followed closely the work published in the special otological journals the subject is necessarily somewhat new and strange. From an historical point of view it is remarkable that the function of the static labyrinth has been so little recognized until recent years. Purkinje, in 1825, was the first to observe the nystagmus in a patient rotated in a revolving chair. He attributed it to a brain irritation arising in some way from the centrifugal force. About the same period Flourens observed a relation between the semi-circular canals in the pigeon. He noted that the disordered movements corresponded to the plane of the canal injured. Although these observations were followed by many others pointing to a similar conclusion, their significance was slow of acceptance.

The labyrinth continued to be regarded as part of the hearing apparatus, and as late as 1877 Helmholtz regarded its function as that of perceiving noises, as distinguished from musical tones, the perception of which he attributed to the cochlea.

According to the views generally accepted at present the internal ear, or *labyrinth,* contains two separate sense organs, (1) *the cochlea,* which is the organ of hearing, and (2) *the vestibular apparatus* (consisting of two sacks, the utricle and saccule, and three semi-circular canals) which is concerned with the perception of accelerated movements in the various planes and plays a part of varying importance in the maintenance of the equilibrium and the determination of the gait of the patient.

These latter functions are, in ordinary daily life, probably much more dependent upon sensations from the eyes, muscles, joints, skin, etc., and it is only when the labyrinth becomes irritated that it proves a disturbing element.

Where the labyrinth has been completely destroyed, a compensation takes place, and little change can be noted apart from some finer distinctions of gait.

The semi-circular canals are concerned with the perception of turning movements in the three planes and, from their anatomical structure, the cristae, which are the end organs of the vestibular nerve, are more disturbed at the beginning or end of such movements, that is, during a positive or negative variation in speed.

In accordance with this view it is clear that the physiological stimulus for the semi-circular canals is a rotary movement of the body.

The reaction to stimulation is shown by nystagmus, which may also be accompanied by dizziness, disturbed equilibrium and (in severe reactions) by nausea and vomiting.

Labyrinthine nystagmus is to be distinguished from that of eye or brain disease by special qualities, which are fully described by the author along with the conventional nomenclature and the rule for classifying the various forms of nystagmus.

The method of carrying out the examination on a revolving chair is described in detail, and some interesting figures are given which the author has compiled from the results of many such examinations carried out by him in this manner.

The degree of stimulation required to give a suitable reaction is a relatively high one, the usual being ten revolutions on the chair at a moderate speed.

In this, however, there is considerable individual variation and in some cases the reaction is stronger after this number of turnings than is required. It has been found, however, the most generally satisfactory amount of stimulation and furnishes a convenient standard of stimulus. Very interesting and important is the discussion of the subjective and objective symptoms of labyrnthine irritation which accompany nystagmus, especially dizziness and disturbance of equilibrium.

It is quite evident that in clinical work a symptom like dizziness, which may arise from so many causes must not, even in a patient with ear disease, be attributed to the labyrinth unless it shows distinctive characters peculiar to this form of dizziness. The symptoms produced by labyrinthine stimulation reproduce in a qualitative way the symptoms seen in irritation of the labyrinth from disease, and such examination of normally functioning labyrinths forms a great aid to the interpretation of the symptoms of all minor ear diseases.

Although turning is the physiological form of stimulation it has the disadvantage of stimulating both labyrinths at once, which at first sight would make it unsuitable for a unilateral examination. It is found empirically, however, that according to the direction of the turning the action of one labyrinth seems to predominate during the turning and the other after, so that a comparison of the two sides can be obtained with a fair degree of accuracy. A convincing demonstration of this is to be obtained by the examination of a case where one labyrinth has been destroyed. The best form of unilateral examination is the caloric, which is also fully described and is as follows:—The ear is syringed out with cold or hot water and the reaction is again by nystagmus, which

varies in direction according to whether hot or cold water is used. This is the best test as to whether the labyrinth has any remains of irritability or not, but is disagreeable to the patient.

Electrical stimulation can also be used, but is not considered of much value by the author, since a reaction can be induced even where the labyrinth is destroyed apparently from stimulation of the vestibular nerve or even deeper nervous connections.

The latter part of the book deals with the symptoms and diagnosis of various pathological conditions of the labyrinth.

Of special interest is the discussion of the destruction of the labyrinth from either acute suppuration, hæmorrhage, fracture of the base of the skull or other causes, and (2) localized labyrinthitis which forms the pathological basis of the so-celled "Menière's disease."

A very practical application of the functional examination of the labyrinth arises from the indication it gives in suppurative diseases of the middle ear of an extension of the disease inward either from the tympanum or antrum. In the event of such a case requiring operative treatment the condition of the labyrinth is an important guide as to how far this special region of the the temporal bone must be dealt with if one wishes to make the patient's future free from danger of intracranial complications and to secure the arrest of the disease with complete healing.

The author draws a comparison between labyrinthitis, with its relation to intracranial trouble, and appendicitis, with its well known dangers to the abdomen.

He gives what he considers to be the indications for operation upon the labyrinth, and describes the method devised by Neumann.

To all interested in the more exact diagnosis of ear diseases this little work is bound to be of great interest.

E. HAMILTON WHITE.

Vienna, January, 1908.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

(Continued from last issue.)

Case of Acute Purulent Meningitis (probably epidemic) in a very young infant.

This case is of unusual interest, because of the very early age of the patient (8 days), the absence of apparent cause, the suddenness of the attack, its rapid termination and the extensive damage found at the autopsy.

The mother of this child, æt. 22, primipara, was in good health when admitted to the Montreal Maternity, had an easy and normal labour on November 10th, 1907, had an uneventful puerperium, and was discharged in good condition on November 23rd. She lived in Maisonneuve, on Notre Dame Street East, near the Dominion Park. There had been no sickness in the house previous to her admission, and, so far as I have been able to ascertain, there have been no cases of meningitis in the neighbourhood.

The child, a female, was premature (about 36 weeks), and weighed at birth 2,400 gram. (5.29 lbs). Although it nursed fairly well at the breast, it lost steadily, and on the eighth day weighed 1975 gram. (a loss of 425 gram.). Such a loss for a week or two or even longer is common enough in premature children, and in this case did not attract any attention, for otherwise everything seemed to be going on normally and satisfactorily. On the morning of the eighth day (November 17th) the child was noticed to be extremely restless, crying a great deal and not nursing well. The temperature was 97°, the pulse normal. The following morning the temperature was 103°, and the pulse very rapid (150-200); there were definite spasms of the upper and lower limbs on both sides, both tonic and clonic in character. Throughout the day at intervals opisthotonos was very marked, the pupils were widely dilated, and there was almost constant twitching of the eyeballs. Soon the child refused nourishment, the respirations became laboured and shallow, the face and lips cyanosed, strength and weight rapidly failed, and the lusty cry of the evening before and of the early morning diminished to a feeble wail. Throughout the day the motions were loose and watery. About 7 p.m. the spasms which had been continuous, diminished perceptibly and the child became comatose. The respirations became shallower, the pulse imperceptible, and death occurred at 7.30 p.m. One hour before death the temperature was 104°. There was no evidence of coryza or conjunctivitis, and there was no ear discharge. The disease ran its course in 36 hours.

The seventh regular meeting of the Society was held Friday evening, January 3rd, 1908, Dr. Wesley Mills, President, in the Chair.

PATHOLOGICAL SPECIMEN: ACUTE ENDOCARDITIS WITH MULTIPLE INFARCTS.

F. B. GURD, M.D.

ANEURYSM OF THE ASCENDING AND TRANSVERSE ARCH OF THE AORTA.

W. S. LYMAN, M.D.

A. G. MORPHY, M.D.—This man came to my office four days before death complaining of dyspnœa but no pain. The dyspnœa was severe,

and there was a very harsh, brassy cough. I suspected aneurysm, but was not able to make out any very definite signs on examining the chest. The stertor suggested at first some laryngeal obstruction, but on examination, I concluded that the trouble must be farther down. His condition grew progressively worse, the difficulty in breathing seemed to come in paroxysms; it was not only that he was continuously oppressed, but at times, particularly on coughing, he would almost suffocate. Just before he was taken in to the hospital a great many moist sounds could be heard at the base of both lungs and he was in an extremely critical condition.

The man was a labouring man and could not speak very good English, but from what I could make out there had been no traumatism.

SARCOMA OF THE INTESTINE.

F. J. SHEPHERD, M.D.

ACUTE PURULENT MENINGITIS IN A YOUNG INFANT.

J. C. CAMERON, M.D.

ANATOMY OF CONGENITAL DISLOCATION OF THE HIP.

W. G. TURNER, M.D.

F. J. SHEPHERD, M.D.—We are all indebted to Dr. Turner for this original paper. It is a very interesting subject and one which is of more importance than was formerly thought. Some twenty-five years ago, in making a dissection in the dissecting room I came across such a dislocation. The history of the case was that the patient had been born with a deformity of the hip, that she had gone around all her life with a dislocated hip, bearing a large family successfully. In this case there was a posterior acetabulum. The head of the bone had come through the capsule of the joint and was lying on the dorsum ilii, a false capsule having formed. I found also in this case that the ileopsoas muscle had been torn away from the lesser trochanter and was attached to the pubic portion of the pelvis. The head of the bone was flattened and that side of the pelvis was much atrophied.

W. G. TURNER, M.D.—As to the age it is relatively easy in bilateral cases up to six years of age, certainly to five, to reduce these cases and proceed with the treatment. In unilateral cases certainly up to six years and frequently to seven. In some cases it is wise to give preliminary treatment for probably six weeks. As to the capsule I think in most of the dissecting specimens the hour-glass contraction is not so marked, as in most cases the slipping round of the head, upwards when body weight is thrown on the affected side, and then back again with

rest; this prevents the usual constriction. But preliminary traction in these older cases is necessary, and here also if this reduction is attempted the fixation must be carefully carried out, as at that age contractures in the pathological condition are very frequent if the fixation was prolonged over long. With regard to the acetabulum described in Dr. Shepherd's dissection, what I referred to was that in most of these cases a new acetabulum does form, but the cavity is not deep enough and it does not retain the head firmly enough to prevent the up-riding when very much weight is thrown on this side. The tearing away of the ileo-psoas in Dr. Shepherd's case was very interesting.

The eighth regular meeting of the Society was held Friday, January 17th, 1908, Dr. Wesley Mills, President, in the Chair.

The evening was devoted to short papers, case reports, and descriptions of pathological materials, all of which had been presented before the Lister Laboratory Club of McGill University during the past year. This club has been in existence now for ten years, and the membership is confined purely to workers in the various laboratories not only of McGill but of other universities in this city. It is held in a very informal manner, and one of the regulations is that no papers are published and no formal papers given. The discussions are merely talks on various points of interest and difficulties met with in the daily work in the laboratory. The other members criticize the points brought up or give suggestions for the solution of difficult problems. The meetings are held once a month during the winter in the pathological laboratories of McGill University.

GIANT-CELLED TUMOUR IN A TROUT.

J. G. ADAMI, M.D.—The report of this case appears on page 163 of the March number of the JOURNAL.

F. J. SHEPHERD, M.D.—Probably twelve years ago I caught a doré with a large sarcoma growing from the ventral surface to one side the median line. It was examined by Dr. Wyatt Johnston, and pronounced a spindle-celled sarcoma.

DERMOID OVARIAN TUMOUR COMMUNICATING WITH THE RECTUM.

WM. GARDNER, M.D.—A report of this case will be found on page 176 of the March number of the JOURNAL.

SARCOMA (SECONDARY FROM MEDIASTINUM) INVOLVING HEART.

C. F. MARTIN, M.D.—The report of this case appears on page 179 of the March number of the JOURNAL.

OSKAR KLOTZ, M.D.—Examination was made of a section taken across the ventricular septum of the right heart immediately below the tricuspid valves, where, under ordinary circumstances, one should strike the bundle of His. In no section was I able to demonstrate this bundle. The heart muscle in this area also was completely obliterated.

WESLEY MILLS, M.D.—To make the heart rhythm depend upon a quantity of muscle so small as that of the bundle of His does not greatly help the myogenic theory; and we are apt to forget that ganglia and nerves have been demonstrated in this bundle; it is not composed entirely of muscle. I have heard nothing so strong against the myogenic theory up to the present as this very case, and I would be very glad if it could be worked out further.

J. G. ADAMI, M.D.—I should like to ask if it is right to speak of the bundle of His as muscular.

WESLEY MILLS, M.D.—They qualify it by saying that it is a muscular bundle of somewhat embryonic character.

BILHARZIOSIS.

R. P. CAMPBELL, M.D.—The report of this case will be found on page 178 of the March number of the JOURNAL.

THE CULTURAL FEATURES OF A NEW ORGANISM OF THE CONJUNCTIVA.

S. H. MCKEE, M.D.—The report of this case appears on page 173 of the March number of the JOURNAL.

CONGENITAL HEART DISEASE.

MAUDE E. ABBOTT, M.D.—This chart was prepared with a view to comparing the clinical history of a number of cases of this condition with the post mortem findings. Dr. Abbott showed the distinct bearing of the two.

CONGENITAL ABSENCE OF GENITO-URINARY SYSTEM OF LEFT SIDE.

JOHN MCCRAE, M.B.—The report of this case appears on page 177 of the March number of the JOURNAL.

J. G. ADAMI, M.D.—It is a matter of common observation that where there is congenital absence of the one kidney the adrenal is to be found. If Dr. McCrae's conclusion be correct—and it seems most plausible—that here we have evidence of complete absence of the germinal ridge of one side, it follows that we must regard the adrenal cortex as having a different origin from the pro-, meso-, and meta-nephros. There are, I know, those who hold this view, but hitherto, I confess that I have been dubious of the evidence brought forward by them.

J. F. SHEPHERD, M.D.—We had quite a number of specimens of displaced kidneys in the Museum, and it was noted that the adrenals were always in their proper position.

WESLEY MILLS, M.D.—The light this case throws on the origin of the uterus in the human subject is particularly interesting.

JOHN MCCRAE, M.B.—I omitted to mention the adrenal because it seemed to me one of the things which follows as a matter of course. If I recollect aright, this is the seventh case I have seen of absence of one kidney, and I am sure in all the adrenal was present. Absence of the genital ridge would account for the absence of the structures which are here missing, and would allow the adrenal, of different origin, still to be present.

HYPOPION IRITIS ASSOCIATED WITH EPIDEMIC CEREBRO-SPINAL MENINGITIS.

F. T. TOOKE, M.D.—The report of this case appears on page 184 of the March number of the JOURNAL.

MELANO-SARCOMA OF THE COMMON BILE DUCT.

CHAS. W. DUVAL, M.D.

OSKAR KLOTZ, M.D.—This tumour has been an extremely interesting and unusual one. The discussion naturally centres around the nature of the cells and the origin of the pigment. Up to the present, there is still much discussion where the actual manufacture of the melanin takes place, whether in epiblastic or mesoblastic tissue. Recently, Wuttig has reported a case of melanotic tumour in the gall-bladder, in which he considers that the pigment arises in the tumour cells, which are of epithelial origin. He studied the development of pigment in normal tissues, particularly that in the negro and some of the lower animals. From these studies he comes to the conclusion that the pigment is produced in the epithelial cells, but is, however, deposited in the connective tissue stroma beneath. How far he is right is yet to be seen. There is this peculiarity in these tumours that their origin is always associated in close relation to epithelial structures, and this seems also the case in the tumour presented.

J. G. ADAMI, M.D.—There have been rare reports by Delepine and others of primary melanotic tumours of the liver and gall-bladder, but with pathologists in general one has up to now doubted this interpretation and suspected some undiscovered primary site in connexion with the skin or choroid of the eye. It is impossible to study Dr. Duval's specimen and his data without being convinced that this is a primary growth, and as such, of the highest interest and importance. As to whether these melanotic tumours, or as Ribbert terms them, Chromatophoromas, are of epithelial or connective origin, whether they are of the nature of Krompecher's "basal celled cancers," or of sarcoma, is

one of the most actively debated questions in pathology at the present time. I am inclined to take an intermediate position and to suggest that they are of mesothelial or endothelial origin, from the endothelium lining lymph spaces. Their variation from the alveolar, cancerous, type to the purely sarcomatous is what we find in the mesotheliomas as a class, in tumours of the adrenal cortex for example.

TUBERCULOMA OF THE TONGUE.

E. M. von Eberts, M.D.—Dr. von Eberts read the report of this case, which appears on page 183 of the March number of the Journal.

TRYPANOSOMES IN MONTREAL RATS. EXPERIMENTAL WORK—ARTERIOSCLEROSIS.

Oskar Klotz, M.D.—The report on these investigations will be found on pages 165 and 169 of the March number of the Journal.

Wesley Mills, M.D.—I should like to ask how many treatments that rabbit had.

Oskar Klotz, M.D.—In the vessels of experimental arterio-sclerosis here shown, we have demonstrated two types of the disease, the one occurring in the intima, where there is a definite proliferation with a secondary degeneration, and the other confined to the media with degenerative changes alone present. Identical changes have been produced by means of various chemicals, but none other to my knowledge by this method of increasing the work of the vessels. The treatment was carried out by suspending the animal for three minutes each day for 130 days.

J. G. Adami, M.D.—I do not know that I quite agree with Dr. Klotz in laying down the sharp difference between these two types of medial degeneration and intimal proliferation. Here, obviously, we have one simple and single cause producing the two orders of events in two orders of vessels of the same individual. We must look to the difference in structure and strain in the aorta and neck arteries respectively for the explanation of the difference. To me the simplest explanation is that in the wide aorta under the increased pressure, the distending force has been such that there has been excessive giving way of the media, and so great a stretching and strain upon the intima that its cells have not been able to respond by active proliferation, whereas in the smaller carotids and subclavians with their lessened lumina and relatively more powerful media the distending force has led to a lessened giving way of the media, the resulting strain upon the intima being within the limits leading to a strain hypertrophy and proliferation.