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## *Original Contributions.*

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### ECTOPIC GESTATION.\*

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BEFORE commencing the consideration of this subject I desire to express my high appreciation of the motives which actuated the members of the committee on papers in placing under my care a subject of such great magnitude. It is one of vital importance to every woman who expects to become a mother, for her very life may depend on the proper understanding of its causation, early diagnosis and management. It is of vital importance to every practitioner, for at any time he may be called upon to differentiate the condition from others with which it may be confounded, and the responsibility of a life must accordingly depend upon his delicacy of diagnosis, his medical acumen, his judgment, and his ability to carry to a favorable termination this desperately alarming and often fatal condition.

With a full knowledge of the importance and gravity of the subject, and with the difficulties which surround its consideration, and in the presence of those who from a wide experience and vast field for observation have become accurate observers, and in the presence, too, of others who, from their research work, have minds well stored with the results of laboratory investigation, I trust I may be excused if I say I approach the subject with much diffidence and with a consciousness of my inability to do it that justice.

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\*Read at the annual meeting of the Ontario Medical Association, June, 1901.

which its magnitude and gravity demands, and which this meeting, from its very importance, should expect.

A study of medical literature, past and present, goes to show that correct ideas of the causation and earlier changes consequent upon ectopic gestation, as well as a real working knowledge of its management, date back less than twenty-five years. Previous to that time deaths were reported from so-called accidental hemorrhage into the peritoneum, and from intraperitoneal and extra-peritoneal hematoceles. Many cases were reported of fetus found in the abdominal cavity, and of lithopedions discovered many years after the pregnancy from which they dated their origin. A few years ago the profession at large could not but regard as extraordinary the diagnostic acumen of the men who could make the diagnosis of tubal pregnancy on the occurrence of rupture. At the present time, with the increase of literature on the subject, and with our better knowledge of its pathology and symptomatology, every physician is expected to make a correct diagnosis on such occurrence and, in a fairly large proportion of cases, to make a diagnosis before the occurrence of rupture.

*Classification.*—Every pregnancy is the result of the impregnation of an ovum of the female by the spermatozoon of the male. The normal place for the development of the impregnated ovum is the cavity of the uterus. The channel through which the ovum must pass from the ovary, in order to gain the uterine cavity, is the Fallopian tube. Just where impregnation normally takes place is still an unsettled question. By some the situation is claimed for the uterus alone, by others for the ovary, and some times for the tube.<sup>1</sup>

On the one hand there is not much evidence for the belief that the seat of normal impregnation is limited to the cavity of the uterus; on the other hand facts are known concerning the invasion of the tubes by spermatozoa, which unmistakably point to the conclusion that normal fructification of the ovum may occur at any stage of its passage from the ovary to the uterus. It may thus be stated that an abnormal arrest, whether mechanical or special, of a fructified ovum in its progress toward the uterus is the determining factor of an extrauterine, ectopic, or misplaced pregnancy. Theoretically this arrest may occur (*a*) in the ovary, (*b*) in the abdominal cavity between the ovary and tube, (*c*) within the tube, and (*d*) between the tube and the uterus. The first seems to be theoretical only. Many writers deny the possibility of the ovum becoming impregnated within the Graafian follicle and continuing to grow there, while others quoting from various observers acknowledging the existence of such fecundation, freely admit that there are but few indubitable cases on record. Howard Kelly<sup>2</sup> describes it as "one of the greatest

gynecological rarities." Taylor<sup>3</sup> says: "It is possible, but absolute proof of such a pregnancy seems to be incomplete." For a practical study of the subject this variety may be dismissed. The second—arrest within the abdominal cavity between the ovary and the tube—is probably almost immediately fatal to the unprotected ovum, owing to the digestive power of the peritoneum, and consequently may be eliminated from discussion. The fourth point of arrest—between the tube and uterus—may be quite correctly regarded as arrest in the uterine portion of the Fallopian tube. To all intents and purposes, then, we have at the outset, but one kind only—arrest within the tube, or *tubal pregnancy*, and it is to this variety I shall mainly direct your attention. All the other varieties are but later developments of tubal pregnancy owing to a secondary invasion from the Fallopian tube. These may be conveniently divided into three groups: (a) tubo-abdominal, or simply abdominal pregnancy, in which there is a secondary invasion of the abdomen; (b) tubo-ligamentary, or broad ligament pregnancy, in which there is a secondary invasion of the broad ligament and subperitoneal tissues; and (c) that subdivision of the tubo-uterine in which there is rupture into, or secondary invasion of the uterus.<sup>3</sup>

*Etiology.*—A careful and thorough consideration of the causation of ectopic gestation is indispensable for a proper explanation of many of the clinical symptoms observed, as well as for an accurate diagnosis at an early date.

Among the classical causes put forth in the various text-books, both large as well as small, one finds something like the following: Diseases of the mucous membrane depriving it of its cilia; other inflammatory changes in the mucous membrane; contractions in the calibre of the tube, the result of chronic salpingitis or perisalpingitis; peritoneal adhesions constricting or distorting the tube; intratubal polypi; atresia of one tube with external migration of the fertilized ovum, or of the spermatozoa of the opposite side; all pointing, as they do, to a previous history of pelvic disease or decided deformity in some form. With these the etiology generally stops, a fact which is at least misleading to the clinical observer. With such etiological factors alone before his mind, he will pass by as impossible an otherwise strongly suspected case.

A study of the development and structure of the tube, and the means afforded by it for the transit of the ovum, will serve to explain the occurrence of ectopic gestation in a woman with no history of pelvic disease, or of long sterility, or, in other words, the occurrence of ectopic gestation in a perfectly healthy woman with normal menstrual functions.

The delicate plications of the mucous membrane of the tube, covered with innumerable cilia waving always toward the uterus,

tend to sweep the ovum onward and outward, while the peristaltic action of the muscular fibres of the tube aids in the work done by the cilia. If from any want of activity on the part of the cilia, or if the action of the muscular coat be impaired, or both, owing to some nerve influence, it cannot fail to have its bearing on the progress of the ovum.

Slight congenital anomalies of the tube, the result of anomalies in early embryonic development of the Mullerian ducts, may produce an imperceptible stenosis in the calibre of the tube, yet sufficient to impede the progress of the ovum on its way to the uterus. Unusual hyperemia, or marked menstrual changes in the tubal mucous membrane renders possible an arrest of the ovum within its folds. One can scarcely doubt that menstrual changes in the uterine mucosa prepare it for the reception and implantation of the impregnated ovum, and when the tubal mucous membrane undergoes unusual menstrual changes, it not only diminishes the calibre of the tubal bore, but it becomes a soil in which an impregnated ovum may easily implant itself.<sup>4</sup>

A further study of the anatomy of the tube teaches us that it is not a straight tube but a convoluted one, bound down at every bend by fibrous bands beneath the serous covering, and that its mucous membrane is arranged in plications, each forming elevations with recesses or depressions between them. From this it may readily be inferred that the journey of the ovum from the ovary to the uterus is naturally a slow one, being retarded by the convolutions of the tube and the irregularities which the plications afford. Next we must remember that the growth of an ovum once fructified is rapid in the extreme, reaching in size at the end of the second week from three to six millimetres in diameter. Now, if there be any diminution in the propulsive power of the cilia, or failure in the peristaltic action of the muscular coat of the tube, or any diminution in the calibre of its bore, the result of menstrual changes in the mucous membrane, or of congenital anomalies, it necessarily follows that the ovum will be further impeded in its journey to the uterus. If to these impediments we add the further difficulties which a fructified ovum, rapidly increasing in size, presents to a canal already somewhat crippled in its efforts to perform its function, it will readily be seen that a point within the tube may be reached when the fructified ovum can no longer be propelled on its journey, arrest must take place, and an ectopic gestation initiated at that point.

Once the ovum has become arrested within the tube, it is there surrounded by mucous membrane within which the chorionic villi develop, and to which the ovum becomes attached, but it is exceedingly doubtful whether there be any true decidual tissue or not. A point which is worthy of careful consideration is the

rapidity with which the local blood vessels become enlarged and dilated. Vessels which ordinarily are quite small become doubled, and even trebled, at a remarkably early period of tubal growth. This is the source of the greatest danger, and accounts for the violent hemorrhage and rapid death after early rupture.

The formation of a decidua within the uterine cavity, while the early changes are taking place in the tube, is also a matter of considerable importance from a diagnostic standpoint. Death of the ovum, in whatever way brought about, is often associated with the shedding of the decidua, which may be cast off in its entirety, or more usually in small pieces, or as a shreddy-like material.

With the growth of the ovum the tube distends, but from its structure and anatomical relations it is very evident that it cannot long keep pace with the growth within it, and consequently most tubal pregnancies end in abortion through rupture of the tube. Many, however, become abortive by hemorrhage from their own blood vessels, and the formation of a tubal mole within the tube. In only a very small proportion of cases does the fetus, after rupture of the tube, go on to full term within the maternal organism. A pregnant tube may rupture very early within the first four or five weeks, or it may continue to distend for several weeks longer, three months being about the outside limit.

Very early rupture has only recently received the attention the great dangers attending it deserve. It not infrequently occurs in those cases in which ectopic gestation has not even been suspected, or in which, from the paucity of the symptoms, the physician has had no material to guide him in that line of thought. There has been no history of ill-health or of pelvic disease, no early signs of pregnancy, unless possibly some ill-defined irregularities at the last menstruation.

I take the liberty of briefly quoting a case which came under my observation some three years or more ago, as a means of picturing the clinical history of such cases.

Mrs. B., aged about twenty, a fine, healthy-looking woman, without history of previous illness of any kind, and married only a few months, was on her return home from a short trip on the steamer seized with rather sharp pains in the abdomen, similar to an attack of intestinal colic or acute indigestion. Nausea and vomiting soon followed, the vomited matter being made up of a full dinner which had been partaken of an hour or two before, and which contained a considerable amount of green vegetables. The general history of the patient elicited nothing special; she had menstruated twelve days before quite naturally as far as she knew. She was given a hypodermic of morphia by her regular physician who was summoned, and advised to remain quietly in bed until

his return a little later. Not long after the husband visited the family physician and announced that his wife was better, was resting comfortably, and that there was no necessity for his return. Early in the evening she complained of feeling weak and faint, and on the arrival of a friend the physician was again sent for, who found an anxious, if not an alarming, condition of affairs. I saw her at once in consultation. The patient was faint and collapsed, the pulse small, weak and thready, the temperature subnormal, the extremities cold, and a cold, gray appearance had spread over the countenance. A careful enquiry elicited that the pain had become localized in the left iliac region. A vaginal examination revealed nothing which would aid in making a diagnosis—*no tumor could be felt*. After a hurried preparation, she was taken to the General Hospital, where we at once opened the abdomen. The cavity was full of blood; I did not think it possible that the abdomen could hold so much, or that a person could lose so much blood and yet be alive. The left tube was first examined, and a rent from which blood was still oozing was discovered in its isthmial portion, about three-quarters of an inch from the uterine cornu. The ovum—about the size of a bean—was found on the anterior surface of the broad ligament, between that structure and the bladder. After removal of the tube the abdomen was filled with salt solution and closed. Intravenous saline solutions were freely used, but she was too exsanguinated to react, and died some four or five hours after. After operation an examination of the tube was made. There was no swelling except at the seat of the pregnancy. The part enclosing the pregnancy was thinner than usual, but without any evidence of compensating growth. The tube seemed to be fully developed; the opening through which the pregnancy had escaped had the appearance as if a small pistol bullet had pierced it from within outward.

Instead of early rupture there is another cause, and, if the most recent microscopical investigations into the early pathology of tubal pregnancy be correct, is the most frequent primary cause of the interruption of such forms of pregnancy, viz., the formation of what has been termed "tubal mole."<sup>5</sup>

The ovum, during its first few weeks of growth, depending as it does for life upon very delicate chorionic villi lightly attached, is in constant danger. Hemorrhage from the tube wall or gestation sac into the intervillous spaces, even though very slight, is apt to detach and crush a number of villi, and in course of time will generally cause the death of the embryo. In more severe hemorrhages, the chorion is more or less completely detached from the decidua, and at once death of the embryo takes place, forming in the tube what is known in uterine pregnancy as "blighted ovum," and may be here termed "tubal mole." The blighted

ovum now acts as a continuous irritant to the tube, producing hyperemia, followed by increasing vascularity and thickening of its walls. Repeated hemorrhages occur, some of which if the ostium abdominale be pervious, passes into the abdominal cavity; other portions of the blood form lamellated clots within the tube, which in their turn increase its size and weight. The overburdened tube now falls over backward and reaches the floor of the pelvis on its own side, dragging with it the ovary and mesosalpinx. With this displacement of the tube there is consequent derangement of the blood return. Torsion of the blood vessels increases the difficulty, and there is, as a result, increased bleeding, often very abundant, into the tube and pelvic cavity. With repeated hemorrhages there is soon formed in the pelvis a well-defined tumor of varying size composed of tube, ovary, and blood-clot, pushing the uterus to the opposite side, and an intraperitoneal hematocele is now formed. This, by repeated hemorrhages, may go on and increase to a large size, filling up the pouch of Douglas and possibly rising up into the iliac fossa, or filling the whole of the lower part of the abdominal cavity.

A considerable number of ectopic gestations have a longer tubal existence than that described. The period to which the pregnancy may advance without rupture will depend much upon the direction in which the growth is greatest. The tube, subject to slowly increasing pressure from within, becomes stretched and thin, and, as it enlarges, it may open up the layers of the mesosalpinx by which space is gained in which pregnancy may develop further without interruption. But the time comes, at the furthest about the third month, when the space is altogether insufficient for the growing tumor. In this case either the layers forming the mesosalpinx must be still further displaced and the pregnancy burrow downward into the cellular tissue beneath it, or the upper layer will become thinner and thinner, until rupture takes place with partial or complete extrusion of the pregnancy into the abdomen. The amount of hemorrhage in this form of rupture is variable, depending much upon the placental site. Should the placental site be distant from the seat of rupture it may be slight, as the portion of the tube in which rupture has taken place may have been almost entirely deprived of its blood supply by its conversion into a thin membrane. If the placental site be torn through, undoubtedly the bleeding will be severe, and at times fatal. In some cases as the blood pressure falls hemorrhage ceases, for a time anyway, and an intraperitoneal hematocele of varying proportions, according to the amount of blood lost, is formed. The patient will be further subject to repeated hemorrhages from increasing detachment and protrusion of the placenta. In this way the hematocele increases in size until it may assume large proportions.

We might here, with some degree of profit, draw attention to the different formation of the two varieties of intraperitoneal hematocele, which, when fully formed, would appear to be identical. In the first variety—that which is formed as the outcome of a tubal mole—it will be noticed that the early formation was the result of a constant dribbling from the tube, partly consequent upon the irritation produced in the tube by the presence of the mole, and partly by the distorted blood vessels, varied by an occasional free bleeding at irregular intervals. In the second the hemorrhage is sudden, relatively copious, and arises directly from the tear in the tube, or from separation of the placenta.<sup>3</sup>

Should the gestation sac in its growth separate the layers of the mesosalpinx, especially if the site be near the centre of the tube, it will ultimately give way in that direction, and the fetus is extruded into the connective tissue space between the layers of the broad ligament, forming what is usually termed “tubo-ligamentary” or “broad ligament pregnancy.” With this rupture there is usually considerable hemorrhage, but it is limited in amount by the attachment of its dense and unyielding walls, and consequently cannot attain any very great size. In this way is formed an extraperitoneal, or broad ligament, hematoma. This brings us to the consideration of the third form of hematocele, and the oft-repeated statement that every hematocele is the outcome of an ectopic gestation, and that when no fetus has been discovered in it, nor any remnants of a previous gestation, it is no evidence to the contrary. While intraperitoneal hematocele may be said to be almost always due to an ectopic gestation, the existence of a broad ligament pregnancy is not always to be considered as having existed when a hematoma is discovered in it. On the contrary, I believe that they are only so formed in a minority of cases, and that the majority of them are owing to menstrual irregularities, arrest of menstruation, or to chronic pelvic inflammatory diseases.

The fourth subdivision in the classification of ectopic gestation, although it cannot be said to be extrauterine, deserves some slight separate consideration. In tubo-uterine or interstitial pregnancy the impregnated ovum develops in the portion of the tube which lies within the uterine wall. It is recognized by all observers as being exceedingly rare. In a collection of 1,324 cases but forty were said to have been interstitial.<sup>6</sup> The cause of this form will in all cases be found to be owing to contraction of the ostium uterinum, either permanent or muscular, so that it refuses to admit the passage of the fertilized ovum. On account of the situation primary rupture may be delayed as far as the fourth month, or even longer. When rupture takes place, it may be into the uterus, and will then become, if we follow up the classification



initiated, secondary intra-uterine pregnancy. This classification seems to be largely theoretical, as I am unable to find any positive demonstration of its ever having taken place. The only rupture that is known to have taken place is into the abdomen. Because of the thicker wall and the greater vascularity of the sac, intraperitoneal rupture is usually more rapidly fatal in this variety than in the ordinary tubal pregnancy. Taylor says: "Hitherto this has always proved fatal in a very few hours." This form of pregnancy is apt to be confounded with pregnancy of the rudimentary horn. The diagnosis is said to be exceedingly difficult, if not impossible, previous to opening the abdominal cavity.

*Symptoms.*—When speaking of early rupture of tubal pregnancy, I anticipated some of the remarks on this part of the subject by pointing out the difficulties that lie in the road to making a diagnosis, owing to the absence of many, if not of all, the classical symptoms generally enumerated. In early rupture—the most fatal form if we take frequency into consideration when comparing it with interstitial pregnancy—there will likely be no pelvic or abdominal signs of definite importance. Very rarely is there any evidence to be obtained from the condition of the breasts. Often the earliest and only symptom is sudden abdominal pain, confined for the most part to one or other iliac region, and associated with symptoms of shock and hemorrhage.

While many cases are of this sudden and wholly unexpected type, a large proportion of ectopic gestations have well-defined symptoms, if carefully and diligently sought for. There are three links in the chain of symptoms which should receive the most earnest consideration, and which I think if properly followed up will aid in no small degree in arriving at an early diagnosis. They are:

1. The pre-pregnant history.
2. The menstrual history.
3. Uterine hemorrhage and the nature of it.

1. *The pre-pregnant history.*—In a large proportion of cases there is a history of several years having elapsed since the last pregnancy, or the patient has been married a number of years without conception. In a moderate proportion of such cases there accompanies this history one of pelvic disturbances, it may be simply of dysmenorrhea in some form; or it may be of a more serious or constant type, pointing to tubal or ovarian inflammatory disease. But whether one or both of these be present, a point that may often be elicited is that for a short time at least there has been a lull in these symptoms, the patient expressing herself as feeling better for some time past than she has perhaps for years before. This point is well to remember, for it will aid materially in making a differential diagnosis, in that there is a history of

illness rather than of improvement in health immediately preceding the formation of a tumor with which the condition might be confounded.

2. *The menstrual history.*—This link in the history possesses two distinct types. (a) The patient gives an unquestionable history of amenorrhœa, she declaring that she has exceeded her normal time by one or two months. Such cases facilitate diagnosis, in that our suspicions are at once aroused to the strong possibility of pregnancy, and accordingly we are put on our guard. (b) The second type is that in which the patient gives a history of menstrual regularity; "she has never missed a term." Such a history is naturally misleading, and, unlike the other, throws us off our guard. If, however, we inquire very closely into the menstrual history of the last one or two periods we will find a change in their character. Previous to that there was a certain type for her which she always looked upon as being natural and which she always expected. Now she remembers, on thinking carefully, that her "monthlies" had not been the same. The first period had been delayed somewhat, it had not come on as it should, or it had been rather scanty. Perhaps the second one had come earlier than expected, and perhaps more profuse or unusually protracted. In fact she may say that she has not yet quite got over her last monthly, and that she is unwell at the present.

3. *Uterine hemorrhage.*—Whether there be a history of amenorrhœa or irregularity in a suspected case, a period arrives when uterine hemorrhage is a symptom. In the case where there is a history of amenorrhœa it will likely be considered by the individual as a return of her delayed monthlies, or it may be regarded as an early abortion. In the cases without such history the menstrual flow, instead of stopping as it should, continues for an indefinite period. An examination of the character of the hemorrhage is of the greatest importance. The blood will be found to be almost invariably dark in color, moderate in amount, steady in the rate of flow, and decidedly thickish.<sup>8</sup> Gushes of bright blood occasionally occur, but they are exceptional and small in amount. The hemorrhage, as a rule, rises from the partial or complete separation of the decidua, and consequently shreds or portions of decidual membrane, rarely the membrane in its entirety, may be found in the vaginal discharges. At this period there arises the possibility that it is an early abortion. I would particularly draw attention to the characteristics of the uterine hemorrhage. *It is dark in color, moderate in amount, with occasional small gushes of bright blood.* These facts will aid largely in diagnosing it from the re-appearance of a delayed, or from a prolonged menstruation, in that there is rarely if ever gushes of bright red blood; and from an early abortion, as the blood at first

is bright, often very profuse, and coming away in large clots. Later, in cases of incomplete abortion, the color of the blood is dark and moderate in amount, but there is usually an odor of decomposition about it. The consistence of the discharge is an important point. *It is thickish*, in fact it has a mucous tenacity about it which is not the case in menstrual blood or in incomplete abortion. There is still another point to be gained from an investigation of the discharges, viz., *the odor*. There is accompanying abortion an odor which can always be recognized in its highest intensity in labor at full term, but which is not recognized in the uterine discharges of an ectopic gestation. In ectopic gestation the odor does not differ from that of the ordinary vaginal secretion.

In making a physical examination I shall pass by those early symptoms of normal pregnancy, and which may be present in ectopic gestation, such as changes in the breast and the color of the vaginal mucous membrane. Sometimes they are scarcely recognizable, sometimes absent altogether. Much stress is often laid upon enlargement of the uterus, "bearing," as some writers say, "a strong resemblance to that of the subinvolved uterus."<sup>3</sup> The symptom is quite often misleading. Not infrequently the uterus is scarcely perceptibly enlarged, even when measured by the uterine sound. In what is known as the Jessop case<sup>11</sup> the uterus at a full term abdominal pregnancy is described as feeling somewhat enlarged, and on measurement by Simpson's sound its cavity was found to be two and a half inches in length. The uterus will, however, always be found softer and more rounded off than an unimpregnated one. The condition of the cervix is also an important means of diagnosis. The os has a velvety feel, the cervix is softer than normal, and when there is uterine hemorrhage the cervical canal somewhat expanded, thus differing from a normal menstruation. I leave out intentionally those forms of dysmenorrhea which are described as *mechanical* and *membranous*, in that on careful enquiry there will be a history of one or other form of dysmenorrhea on many previous occasions. Again, while it is noticed that the cervical canal is somewhat dilated and the cervix softened, the extent of dilatation is never very marked, nor is the angle between the cervix and body of the uterus obliterated. This affords another point in differentiating ectopic gestation from early abortion.

The presence of a tumor in one or other fornix of the vaginal vault, and lying by the side of the uterus, but separate from it, is another important symptom. In the earlier stages, before the growth has assumed any size, and particularly when the gestation sac is in the isthmal portion of the tube, such will not be readily felt. If anything is discovered bimanually, it will be in the form

of a small spindle-shaped enlargement in the tube. Later, and especially when the gestation is ampullar, or the pregnancy has terminated in the formation of a tubal mole, this mass will topple over, after the manner already described, and will be found in the vaginal vault, either as a rounded or elongated tumor, according to whether the dilated ampullar end of the tube lies vertical or horizontal on the pelvic floor. This point it is well to remember, as we are told to expect to find on examination an elongated tumor. Such will not be the case when the rounded out ampullar extremity stands, as it were, upon its head on the pelvic floor, the isthmal end extending somewhat obliquely toward the uterus. The tumor will then have a rounded-off feel resembling a cystic ovary.

Much, too, has been said about pulsating vessels being present in the vaginal vault. This sign, when present, must be a very valuable one, but it is not always present. It cannot be perceived before prolapse takes place, unless one has a touch sufficiently sensitive to distinguish the increased volume in the pulsation of one uterine artery when compared with that of the other. After prolapse it is not always possible to distinguish increased pulsation until adhesions have taken place and collateral circulation supplied.

I have selected the following case for illustration because of its very recent occurrence and characteristic history. Not the least interesting point about the case is the remarkable coincidence of its presentation at the office at the time when the section of the paper just under review was in preparation.

Mrs. B., aged 31, a strong, vigorous, healthy-looking lady, came to my office on May 6th last, complaining that she had been "unwell" for the last month or more. She had been married thirteen years and was the mother of three children, the youngest three years and a half old. Her "monthlies" had always been regular and painless except some six years ago, when she had been irregular as to time for many months. She last-menstruated January 30th, missed in February, and again at the end of March. On April 2nd she commenced to lose some blood having, as she said, all the characteristics of her ordinary menstruation. This discharge continued in varying quantity throughout the whole month of April, and up to the time of her appearance at the office. There never was at any time an immoderate flow. No clots had been passed, sometimes the blood seemed quite bright, or brighter than usual. She was quite certain that nothing had come away that would attract attention as unusual. She had none of the early signs of pregnancy so characteristic of her in former pregnancies, and accordingly felt quite certain she was not pregnant. About three weeks before she had rather a sharp pain in the left iliac

region, which lasted an hour or two and was accompanied by vomiting. On examination I found in the vagina, and exuding from the cervical canal, a brownish-black discharge, small in quantity, and with a thick mucous-like tenacity. There was no shreddy material that I could detect with the eye. The cervix was soft and the canal somewhat patulous. The uterus was not enlarged. A small, smooth, globular tumor, freely movable, and about the size of a Tangarine orange, could be felt in the left vaginal fornix. The tumor was only perceptibly tender, and unusual vascularity in or about it could not be detected. On May 8th, two days following, she returned to the office saying she had been seized with a severe pain in the left iliac region late in the forenoon, and that she was still suffering from it. I ordered her at once to the hospital, to be kept there under strict observation. Late in the evening I again examined her, and found the same condition as previously, but without symptoms which might cause anxiety as to a possible rupture. Early the following morning I operated. The pregnant tube—the left one, and which I now present to you for examination—was readily lifted from the floor of the pelvis. There were no adhesions, and its removal was completed without event. Dr. W. T. Connell, pathologist, has kindly furnished the following report: "The ovary is small, measuring 3 cm. x 2.2 cm. x 1 cm., and contains a corpus luteum measuring 1.3 cm. x 1 cm. x 1 cm. The tube shows towards its abdominal ostium a globular enlargement 5 cm. x 4 cm. x 3 cm. The ostium of the tube is open, but the fimbriæ are partly inverted. On cutting into the enlargement it is found to consist almost completely of clot; a few shreds of tissue are visible, but cannot be recognized without microscopic investigation. The corpus luteum is that of pregnancy, and the enlargement of the tube a tubal mole."

Enticing as the subject may be, time will not permit a study of the further development, mode of growth, or physical symptoms of the various kinds of hematocele, the outcome of ectopic gestation, and which have been so well illustrated in a remarkable series of lectures on ectopic gestation, by John W. Taylor, of Birmingham,<sup>3</sup> nor of the final termination of the secondary broad ligament and abdominal pregnancies, the outcome of primary tubal pregnancy. The very interesting discussions which have been in progress of late years as to the fate of the fetus after rupture into the abdominal cavity, whether it lies naked there, or is still enveloped in an amniotic sac, is an inviting field to enter. It has generally been conceded that a continuation of the gestation is impossible on account of the digestive power of the peritoneum, and accordingly various explanations have been advanced for the occurrence of the seemingly impossible. Tait<sup>10</sup> advanced the

theory that all such pregnancies which had survived intraperitoneal rupture were originally broad ligament pregnancies which had remained till the seventh or eighth month, and when rupture took place the vitality of the fetus was maintained, "its tissues having arrived at a period of development by that time which enabled them to resist the efforts of digestion which doubtless would be directed toward them." Taylor, in his clear and comprehensive way, defines the more generally accepted theory on the subject. "When a fetus which has already formed within the Fallopian tube escapes into the abdomen of the mother, enclosed in its own *unruptured membranes*, pregnancy becomes 'abdominal.' If the placenta retains its attachment to the tube, and receives sufficient blood supply from the maternal blood vessels, the pregnancy may pursue an uninterrupted course to term, and both child and placenta attain mature development within the peritoneal cavity of the mother. The protection of the *unruptured amnion*, however, appears to be absolutely indispensable for this development." The point claimed is that every abdominal pregnancy which has maintained a prolonged growth, or reached full term, has done so within its own sac, which has separated it from the general peritoneal cavity. That this sac may exist as a scarcely perceptible membrane, or thin veil, and perhaps spread out from organ to organ, and intestine to intestine, nevertheless it can on careful observation always be demonstrated.

In cases reported of the child lying naked in the peritoneal cavity, he asserts that a careful analysis of official reports always gave evidence that such a membrane or sac existed. Mordecai Price,<sup>12</sup> in an interesting article on this subject, is still more sweeping. He says: "The only way an intraperitoneal pregnancy can come to term is encapsulated in the amniotic sac. The sac is a foreign body in the peritoneum, and adheres to everything coming in contact with it. The adherent viscera protect as well as nourish the displaced ovum. The peritoneum would digest the fetus at any age not protected in some way from its influence."

The further formation and growth of the placenta after primary rupture is another interesting field for investigation and study for the obstetric surgeon. What to do with the placenta is one of vital importance. A mis-step in its management at the time of operation may cost the patient her life. Sutton and Giles<sup>20</sup> write: "A uterine placenta consists of fetal and maternal elements, but a tubal placenta possesses fetal elements only, for in a tubal pregnancy a decidua forms in the uterus, not in the tube; further, the tubal mucous membrane takes very little share in the formation of the placenta." This is probably true in the early period of ectopic gestation, but as the placenta increases in size, and particularly after rupture, it not only takes up and

changes into its own tissue that of the Fallopian tube, but often also spreads out and becomes attached to organs and structures in the immediate neighborhood—the back of the uterus, the broad ligament and the pelvic walls being favorite sites for such extension of attachment.

A third interesting field that might be presented for study is the management of full term ectopic gestations. So satisfactory have been the recent efforts of surgeons to take into consideration the life of the child, as well as the mother, that definite rules are being laid down for their guidance. Edwin B. Cragin, in an article on "The Treatment of Full-term Ectopic Gestation,"<sup>13</sup> asks and answers three very vital questions:

1. Is the viable ectopic gestation worth saving?
2. Do the attempts to save the child seriously increase the mortality or morbidity of the mother?
3. What is the best procedure at the time of operation?

As to the first question, the writer replies in the affirmative, and shows photographs of three fetus which were in a good state of maturity. The only one of three born alive is reported as leaving the hospital a vigorous, healthy child.

Taylor says in regard to this question, "So far as my own experience goes, the extrauterine child, at term, in size, weight and nutrition is in no way behind the average. The child is often locally affected or malformed. These deformities are most commonly met with in children of abdominal pregnancies. The children of ligamentary pregnancies, and particularly those of the posterior variety, may be free from any visible defect whatever."

As to the second question, Cragin says: "Maternal mortality, when the operation is performed during the viability of the fetus, will always depend very largely upon the judgment and skill of the individual operator in his decision as to the treatment of the placenta, viz., whether it can be removed without great danger of fatal hemorrhage, or whether it is wiser to leave it to be removed or to come away later."

The third question is subdivided into a discussion on the best time to operate, and the technique of operation. It is argued, and apparently with much reason, that while "any additional growth and development which can be given the child is a thing to be desired," it must be admitted "that at the completion of the full period of gestation, and during the spurious labor, there is some danger of rupture of the gestation sac and fatal hemorrhage," and accordingly, "when the fetus is alive, and with the mother under careful consideration, and in the absence of unfavorable symptoms on her part, at about eight and one-half months of gestation is the most desirable time for operation in the interests of both mother and child"

I have trespassed some little distance beyond the limit of my intended paper, but I trust not without some profit.

I have endeavored to elucidate as far as time and my own feeble efforts will permit the causation and early symptoms of this important subject, and to trace the early growth of the ovum up to the time of rupture or termination in tubal mole. Here, with a few additions having reference to intra-abdominal life after rupture, I may be permitted to rest the subject, with a confidence that the points which have been raised will elicit an earnest discussion from you, and in that way I shall be able to share with you your knowledge and experience.

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## THE EARLY RECOGNITION AND TREATMENT OF PULMONARY TUBERCULOSIS.\*

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It is too well known what a scourge tuberculosis is to render it necessary to cite facts in proof thereof; nevertheless, it is well to refresh our appreciation of the matter from time to time by recalling a few important facts. According to the Report of the Provincial Board of Health in 1899 there were 3,405 deaths from tuberculosis out of a total of 28,607, nearly 1 to 8. This is a trifle lower than the death-rate usually attributed to tuberculosis, and may possibly be due to the more intelligent management of the disease. It is, however, not so great a reduction as has occurred in many parts of the United States, in Glasgow, and some other parts of the Old World. No doubt the education the public is now receiving will in the near future do much to lessen this death-rate, chiefly by curtailing infection rather than by curing the infected.

It is to be noted, however, that the death-rate is not a true index of the prevalence of the disease; this was well shown by the experience of a German investigator who tested 2,500 apparently healthy persons with tuberculin, and in 18 per cent. of these there was a decided reaction. This result has been strikingly supported by those of Councilman, of Boston, who found in a large series of autopsies on cases dying of diphtheria that 17 per cent. showed evidences of tuberculous infection. These facts go to show that probably one in every five or six people are the subjects of tuberculosis, latent or active. In many of these, fortunately the infection remains permanently quiescent. The old German proverb, "that every one has little tuberculosis," is not far astray.

The early recognition of the disease is of vital importance; it is of importance in the first place to the patient himself, because it is only in this stage that there is much ground for hope of a cure; and, in the second place, to his friends, because he has not yet become a source of infection, as ulceration and dissemination of bacilli in sputum, etc., have not begun. At this stage the patient's vital powers are still good, and they have to contend only with the bacillus of tuberculosis; at a later stage there is the secondary infection by streptococci, staphylococci, or pneumococci, and the condition becomes one in reality of septic as well as tuberculous infection.

\* Read at meeting of the Grey and Bruce Medical Association, at Walkerton, May, 1901.

It has been the custom of some writers to speak of a pre-tuberculous stage of this disease. There can be no doubt that this is in reality the early stage of tuberculous infection, during which it is of the utmost importance to recognize the disease, in order that proper management may be instituted. In order to arrive at an early diagnosis, every symptom and clue must be canvassed, not only in itself, but in its associations. A symptom may be of little volume alone, but occurring in association with others it may form the ground for a positive conclusion.

Of the early symptoms, the most constant are some loss of vigor, with slight disturbance of temperature. The recurrence of fever, even of a fraction of a degree above 99 degrees F., every afternoon without apparent cause, should excite the gravest suspicion. The elevation may not be constantly found, but its frequent occurrence should arouse apprehension. The temperature in tuberculous patients is peculiarly sensitive to disturbing influences; it is well, therefore, in doubtful cases, to take it after a walk or excitement of any kind. If with the elevation of temperature there are also such symptoms as debility, loss of appetite, slight loss of weight, and anemia, there is usually but one interpretation to be given. The occurrence of chlorosis, with elevation of temperature, is especially significant. The younger Klebs is said to get the reaction of tuberculosis in all such cases with the use of tuberculin. In all case of amenorrhœa, therefore, the possibility of tuberculosis should not be overlooked.

The tendency of anemia is very great. There is usually undue pallor of the mucous membrane, as well as of the skin. As a rule, examination of the blood does not show a reduction of red corpuscles or of hemoglobin in keeping with the appearance of the patient. The condition seems to be a general reduction in the volume of the blood rather than of the corpuscular elements or their pigment. In some cases, in fact, the serum seems to suffer more than the corpuscles, just as it does in many, if not most, cases of profound mal-nutrition or marasmus. In such the blood drop is dark and contains over its five million red corpuscles per c.cm. In these cases emaciation is always decided.

Although the temperature is usually elevated slightly, it is of the utmost importance to remember that instead of elevation it may be depressed, and run a sub-normal course for many days, or even weeks, in succession. This is most frequently observed in those living an out-door life. This occurs probably more frequently in the more advanced cases, and possesses a significance equal with that of a febrile course. To obtain the fullest benefit from the temperature range, it is necessary that it be taken regularly several times a day.

The importance of the temperature is well illustrated in a case

of a farmer whom I examined several times during the last few days. Absolutely nothing could be found wrong on examination of his lungs, but he had lost flesh slightly, also color, and his temperature in the afternoons varied from 99 2-5 to 99 4-5. He has had some cough and expectoration for the last three weeks, but there are no bacilli to be found on repeated examinations of the sputum. In his case I have scarcely a doubt that there is tuberculous infection, and have advised that a test be made with tuberculin.

Rapidity of pulse is an early and characteristic symptom. It may be as suggestive as the disturbance of temperature, and is easily excited by both physical and mental causes. It is of much prognostic value as a rapid weak pulse means danger. This lack of equilibrium is doubtless due to the tuberculous toxine acting as a circulatory depressant and vaso-dilator. There are many other causes that render the heart easily disturbed, but none more frequent than tuberculosis.

In some cases the first sign of the disease is hemoptysis. In many of the cases it is quite impossible to find any physical sign of disease of the lungs, yet the occurrence of such hemorrhage without obvious cause is almost sufficient ground for a diagnosis of tuberculosis. We meet with many cases of hemoptysis from time to time in whom no other symptoms of tuberculosis ever occur, and yet the cause in them is almost certainly tuberculous. It is worthy of remark that such attacks are rare in those leading an out-of-door life.

Occasional cases are met with in which early hoarseness is the first to attract attention. With this there is usually very slight cough, of which often the patient is not cognizant. In these cases it has been recommended to give iodide of potassium in moderate doses for a few days in order to increase expectoration so that tubercle bacilli may, if the case is tuberculous, be demonstrated in the sputum. Its use may also enable us to discover fine crepitation in the apex of the lung.

Pleural affections are, in a good many cases, the first signs of tuberculosis. They are nearly always secondary to an infection elsewhere, and may be excited by direct eruption of tubercle through the membrane from lung or glands, or by the toxine circulating in the blood. Local dry pleurisies are the most common, causing usually sharp lancinating pains in the chest. Pain in the chest, however, in the majority of cases of tuberculosis, as in other anemic conditions, is not inflammatory, but rather neuralgic. Large pleural effusions are not infrequently met with as the first sign of tuberculosis, and may long resist treatment. In a lady in a western town whom I saw in November, 1899, the effusion was so rapid that aspiration was necessary every five or six days

for many months. No focus of tuberculosis could be discovered although the effusion was doubtless tuberculous. She improved in health for some time, but has again declined of late.

Among the earliest symptoms in a few cases must be mentioned loss of appetite and derangement of digestion. In such cases it is wise to note the condition of nutrition and the state of temperature. Such derangement of digestion itself does not give rise to elevation of temperature, unless it is due to a catarrhal inflammation of the digestive tract.

While in the great majority of cases the development of tuberculosis is characterized by some or all of these symptoms, it must not be overlooked that occasionally the disease is met with in stout, robust men, who show no depreciation of health or strength, or loss of flesh, and yet the physical signs may be unmistakable and bacilli be found in the sputum.

In estimating the possibility of tuberculosis in any case, due account should be taken of the hereditary tendency and former conditions of life, including the probable exposure to contagion. From time immemorial great importance has been attached to the family history; hereditary tendency was given the first place in the causation of tuberculosis, but with our knowledge of the contagiousness of the disease came also our doubt of the prime importance we were wont to attach to it. It now takes quite a subordinate place in the etiology of the disease. The disease is rarely inherited, and no matter how bad the family history of a child may be, it is certain that it will never become affected with tuberculosis if its environment is healthy and its atmosphere free from the ubiquitous bacillus. It is equally true, however, that no matter how vigorous a constitution the child may inherit, the liability to contract the disease is great if exposed to the contagion under favorable conditions for its development. We have all met with heart-rending instances of whole families, in which for generations there had been no case of tuberculosis, being wiped out by the return to the family fold of one who, during an absence from it, had acquired the disease. An instance of this kind came under my observation not long ago; a brother who had been absent for a year or two came home ill with pulmonary tuberculosis, from which he died within a year. A sister who nursed him became affected before his death. She in her turn was nursed by her mother, who acquired the disease before the daughter's death, and so the disease progressed until one after another the whole family of the mother, two sons and three daughters, had died of tuberculosis, which was introduced into it by the infected brother. Therefore, in estimating the probability of tuberculosis in any patient, his previous life, with its exposures to contagion, his work, his dwelling, his associations and his habits should be well

canvassed. The family history is chiefly of importance, as it affords evidence of exposure to contagion.

Before referring to the physical signs to be sought for and interpreted, let me say a few words about the methods of examination. In my clinical teaching, I fear I often weary my students with the reiteration of the importance of inspection in the examination of patients. Our eyes are by far the most important organs through which to acquire information, and in physical examination I venture to say they are the least systematically used. Excellent physicians often fail in diagnosis because they do not use their eyes to advantage. In no class of cases is it more important that care should be taken in inspection than in pulmonary tuberculosis. All males, and with due exceptions females also, should be stripped to the waist, and placed at ease so that a good light shall flood both sides equally. Then the formation of the chest can be observed, careful note being made of any irregularities, retractions, the expansion, the unison of movement of the two sides, the action of the intercostal spaces, the position of the cardiac impulse and of Litten's diaphragm phenomenon.

Palpation and percussion do little more than confirm the information obtained by inspection, as in these early cases fremitus and resonance are yet unaffected.

In auscultation, careful study should first be made of the rhythm and character of the respiratory sound and the length of expiration. Not rarely the first deviation from the normal discovered is a slight weakening and roughening of the respiratory resound, with some prolongation of expiration. This change may be sufficient for the diagnosis, especially if associated with the constitutional symptoms already referred to. The absence of physical signs in these early cases is due to the fact that disease begins deep in the apex of the lung, and is therefore surrounded by a thick layer of normal lung tissue, through which abnormal sounds fail to be conveyed.

Recently the X-Rays have been used for purposes of diagnosis. Deposits in the apex of the lung are shown by the occurrence of a dark shadow, but the deposit requires to be fairly extensive to make the shadow sufficiently deep to be of practical value. The movements of the diaphragm can be observed by the rays, and when one lung becomes materially diseased the expansion of it is restricted, so that the diaphragm does not descend to as low a level on the affected side as on the healthy. This, however, also requires considerable advance in the disease, when the condition can usually be distinguished by physical examination.

Finally, I would emphasize the importance of repeated examinations of sputum. Not rarely patients say they expectorate nothing, and yet if a receptacle be provided they manage to secure

a pretty fair quantity within the next twenty-four hours. As a rule, in the early stages no bacilli can be found, because ulceration in the bronchi has not yet taken place. Any sputum that can be obtained, however, should be examined with the utmost care.

There still remains a resort to tuberculin to confirm or disprove our suspicions. As to the wisdom of using the tuberculin test for the diagnosis of tuberculosis there is some difference of opinion among competent observers. Led by Virchow, a strong protest was entered a few years ago against its use, on the ground that it might light up latent foci and lead to a rapid dissemination of the infection. On the other hand, many careful observers who have had large experience assure us that with the small doses necessary for diagnostic purposes the fear is groundless. Dr. Trudeau, of Saranac Sanatorium, told me a few weeks ago that he had continued to use tuberculin since its introduction without its having had any deleterious effect in any case, and that it had never failed to determine the existence of tuberculosis in doubtful cases where it occurred. He has found it invaluable in determining the existence of disease in cases in which otherwise a positive diagnosis could not be made. In the light of this experience one need not hesitate to use it to determine the existence of a disease whose early recognition is of such paramount importance. One, or one and a half mgms. is usually sufficient to begin with; if there is no reaction the dose may be doubled until a dose of five or at most ten mgms. are given; the absence of a reaction then being deemed sufficient to exclude the existence of the infection. The patient should be observed for a day or two before to determine the natural course of temperature, then the dose given in the evening will, if the reaction occurs, show a disturbance of temperature in the morning. The injection may be repeated every day or second day until a conclusion is reached.

Of the treatment of tuberculosis I will only refer to the general principles. For this disease there is no known specific remedy—none that has any direct influence on its progress. We have, therefore, to depend chiefly on developing vigorous health; this is not only the most effective means of cure, but also the only protection against further infection. Nature unaided cures tuberculosis daily. The history of all races of men and animals bears testimony to the fact that an out-door life is a positive barrier to the development of the disease. The North American Indian, so long as he lived on the open plains, sleeping in the open or in his tepees, was practically a stranger to the disease, but with their housing has come a terrible death-rate among them from tuberculosis. The disease is unknown among the animals that roam over the plains, and also among the cattle that are unhoused in winter. It is practically never met with among the cattle of

the Scottish Highlands. These facts are eloquent in suggesting to us the proper management of people in the prevention of the disease as well as in cure of those who have contracted it.

By out-of-door life we mean the constant living in fresh air day and night irrespective of weather. We are frequently asked by the affected or their friends if night air is not bad? I am in the habit of responding that indoor night air is usually very bad. No kind of weather should prevent a case of any kind of tuberculosis being in the fresh air—much less a suspected case. A patient who is suitably clothed cannot take cold. This is a difficult lesson to teach people in general. There are few houses in the country to which fair arrangements as to shelter cannot be made, in which one can sit, or even sleep if necessary, sufficiently protected from inclemency of weather. These remarks apply to cases in all stages—it is of the early we are speaking to-day. Nothing should be allowed to interfere with *their* living in the open air. In many of them the mode of life or occupation may be changed, so as to give the fresh air life that is needed. I have sent many young men in such conditions of health to the prairies to follow ranching, or other occupations they can obtain there, and the results have invariably been gratifying. One young man with well marked excavation in one lung, and of course some disease in the other, went out beyond Calgary seven years ago to a ranch; he has recovered vigorous health, and has now a large ranch of his own. A young physician went out four years ago with tuberculous ulcer of the larynx, but without any symptom of disease of the lung; he started practice out there, has completely recovered, and is spending this summer taking a post-graduate course in Europe.

Many, however, especially females, cannot take advantage of such favorable conditions, but must remain at home and earn their daily bread; but even in the worst of these cases, in the country especially, much can be done to improve their condition by securing the freest possible fresh air life, day and night. In the cities the conditions are very different; we are constantly meeting with young women particularly, in the early stages of the disease, who, if they could be placed in favorable surroundings, would make rapid recovery; but for lack of such conditions usually die before the advent of the second winter. These are the cases that stand in such great need of treatment at sanatoriums where they can be kept in fresh air, and be carefully looked after.

For such symptoms as loss of appetite, malaise, rapid pulse, cough, and the night sweating that so often results from debility, nothing that we know of does so much to relieve as fresh air. The more pleasurable surroundings in which such fresh air is enjoyed the greater the benefit. We all know how much greater a holiday

with exhilarating accompaniments benefits us than a dull one. Many dyspeptics are able to eat and digest much more away from home than at home, even when the supplies at the latter are as good, if not better, than those obtained abroad. The mental attitude has very much to do with the results obtained.

Rest is imperative in all cases of tuberculosis in which the temperature is above normal. Exercise is of importance, and should be judiciously taken, with due regard to its effect on the temperature and pulse. If these are materially increased by it the exercise is beyond the powers of the patient. The diet should be as generous as can be digested, in febrile cases the heaviest meals being given in the early part of the day, as the temperature is usually normal then. In the way of treatment the first place should be attached to whatever will improve the powers of digestion, and everything that tends to disturb this function scrupulously avoided.

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## REMARKS ON MODERN VIEWS OF THE SOURCES OF TYPHOID FEVER.\*

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WHAT, it may be asked, are the modes of conveyance of the typhoid fever poison into the human body? It appears that isolated cases and epidemics of this disease are alike to be attributed to pre-existing cases of typhoid fever, and this fact presupposes that the germ of the disease, known as Eberth's bacillus, is conveyed through some channel from the sick to the well. The poison leaves the body of the patient through the feces and the urine, which are practically the only primary sources of infection, and contain the bacillus of Eberth in great numbers. "In the vast majority of instances," says Anders ("Text-Book of the Practice of Medicine," 4th edition, A.D. 1900), "the poison is transmitted from those affected with the disease to those in good health through the drinking water supply."

Typhoid infection of a water supply may be direct or indirect. Direct infection occurs through the entrance of ordinary sewage containing the Eberth bacillus, or of feces or urine discharged along the banks of a river, creek, or lake—for example by persons suffering from the disease, or who are convalescing from it. Indirect infection occurs from discharges of infected feces or urine deposited in or upon the soil, and subsequently washed by melting snow or rain into wells, creeks, or other bodies of water. Harrington ("Manual of Practical Hygiene," A.D. 1901) expresses a modern view of this subject as follows: "Ordinary sewage pollution is not sufficient to bring about an outbreak of typhoid fever, nor will specific pollution necessarily always be followed by the occurrence of cases. The Eberth bacillus has only a limited tenure of life, and in the absence of conditions favorable to its existence it may perish before it reaches the consumer. Moreover, the number present may be very small, and the effects produced so slight as to occasion no great notice. It is to be borne in mind that not every mouthful of a polluted water supply contains the organism, and that not every person to whose system it gains access must necessarily sicken with typhoid fever."

Until quite recently it has been supposed that the Eberth bacillus had its origin only in the feces of pre-existing cases; but it is now known that this is an erroneous view. It is also known

\*Read at meeting of the Executive Health Officers of Ontario, Brantford, June 25th, 1901.

that this bacillus exists in the fecal discharges during only the early stages of the disease—to the twentieth day, or perhaps even somewhat later. Petruschky has shown (*Centralblatt für Bacteriologie und Parasitenkunde*, 1898, XXIII., No. 14) that the urine of a typhoid case may contain millions of living bacilli of Eberth in each cubic centimetre, and that they may be found for many weeks and even after convalescence is well established. They may appear as early as the fifteenth day, when they are perhaps no longer demonstrable in the feces.

Dr. Mark W. Richardson (*Journal of Experimental Medicine*, May, 1898) found them in very large numbers and in practically pure culture in the urine of nine out of thirty-eight patients. They appeared late in the course of the disease, and continued to be eliminated in several of the cases after discharge from the hospital.

These observations of Petruschky and Richardson have been confirmed by F. Neufeld (*Deutsch. Med. Wochenschrift*, 1900, No. 51, p. 284). In twelve cases, which he studied with the object of obtaining information on this point, he found three who had this special form of bacteriuria.

He states that the urine containing the Eberth bacillus presents the following characteristics: The bacilli appear suddenly in the urine, and in such numbers that in the space of one day the urine becomes thick and clouded. There is no disorder of micturition, and there are no symptoms of cystitis. The urine remains acid, and, in addition to numerous typhoid bacilli, almost always in a state of pure culture, sometimes contains a small quantity of pus; there is no albuminuria connected with this bacteriuria, and if such a condition were present in the patient before the onset of typhoid fever, it is not increased.

The bacteriuria occurs sometimes during the second or third week, most generally, however, during convalescence, and lasts for several weeks, months, or even for many years. It is not dependent on the gravity of the typhoid infection, and is met with in about 25 per cent. of the cases.

Neufeld further remarks that urotropin makes the urine of these patients clearer, and diminishes the number of typhoid bacilli; but the bacteriuria reappears as soon as the patient discontinues the medicine, which for this reason should be administered for many weeks or even months. Urotropin has no prophylactic action on the essential cause of the bacteriuria. Neufeld in publishing his report wished to draw attention to the endemic propagation of typhoid fever by the urine of typhoid fever cases. The danger of contaminating water supplies seems to him to be very much greater from infected urine than from fecal matters.

It appears, then, that an apparently well person is capable of

infecting a water supply to a greater extent and with less optical evidence, or none at all, by a discharge of urine into a water course, than an evidently sick one by a deposit of his feces in it or upon its banks.

Confusion occasionally arises in the minds of observers because a water supply, which has been certainly deemed to be the cause of a typhoid outbreak, is after a certain time used without causing fresh outbreaks. The life history of the Eberth bacillus throws a certain amount of light on this phenomenon. Assuming that the Eberth bacillus has been washed into a well from the surface of the ground, Anders says, in Text-Book of the Practice of Medicine, A.D. 1900, that "it may retain its vitality for from seven to fourteen days in the water, disappearing from the same on account of the presence of saprophytes," and this is the current view almost universally received. Professor Chantemesse, of Paris, in an article published in *La Presse Medicale*, June 5th, 1901, denies the correctness of the view. He says: "It is not true to state that the typhoid bacillus dies rapidly after it has invaded a natural water supply, even when that supply is impure." Chantemesse has recovered the bacillus typhosus from natural water forty-four days after he had placed it in this water. He claims that this bacillus, when introduced into potable water, does not lose its vitality and disappear from the same on account of the presence of saprophytes, but that it becomes weaker, less virulent, and less able to cause infection, assuming itself a saprophytic form. All the same, this weakened bacillus can be strengthened and regenerated in water, and can be made to resume a pathogenic role. Accepting this explanation, it is reasonable to conclude that a water supply receiving occasional pollution from Eberth bacilli at lengthened intervals might only prove infective for a few weeks on each occasion, after the introduction of these microbes; but if there happened to be a persistent contamination of the drinking water with Eberth bacilli, derived from typhoid dejecta (liquid or solid), an epidemic or endemic of typhoid fever would be caused in those who used that water supply.

There can be no doubt that pollution of a well by human dejecta leaking into it from a privy pit (direct), or washed into it from the surface (indirect), is believed to be an efficient cause of typhoid, and the water is the immediate source of the infection. Reports appearing in the transactions of the Provincial Board of Health of Ontario for the past nineteen years refer to the fact that a well has become polluted with sewage, because the upper surface of the land is of sand, with an underlying clay, at a depth of from ten to twenty feet, or with clay on top, a water-bearing gravel belt beneath, and a substratum of blue clay at a depth of eight or nine feet,

as at Stratford. It is contended, and generally accepted, that excretal liquids drain from the privy pit through the sand or gravel to the well, which reaches to a greater depth than the pit. This theory of infection is open to the objection that filtration of polluted water through sand is a recognized means for destroying bacterial organisms, and that while chlorides, sulphates, phosphates and other salts contained in sewage may be present in solution in the well water, Eberth's bacillus may not be present. This objection might be disposed of by emptying a bag of salt into a suspected privy pit and then testing the well water quantitatively for chloride of sodium. If salt will pass, then the excretal liquids are strained through a rather coarse filtering medium, and Eberth's bacillus can also pass. The well-known epidemic of typhoid at Lausen, Switzerland, demonstrates the soundness of this test. In that epidemic "everything pointed to a direct connection between the impounded water of the contaminated brook and the spring a mile or more distant on the other side of the ridge, and its existence was established by dumping about a ton of salt into the brook, and noting its speedy appearance in the Lausen spring. As a very large amount of flour deposited at the same place gave no evidence of its appearance, even in traces, it was proved that the water passed through a coarse filtering medium rather than through an open underground passage" (p. 365, "Manual of Practical Hygiene," Harrington). Where the filtering medium lying between a privy and a well would be of gravel, there ought to be, and probably is, a free communication between them. It would certainly save much time and speculation on the part of the reporter, if the salt experiment were tried in cases of incriminated wells. If salt passes there is good reason to believe that the Eberth bacillus will pass, and if salt will not pass the contrary may be concluded. Owing to an improved technic, the outcome of fifteen years of work on this subject, Chantemesse states, in the paper already quoted: "The method enabling one to discover rapidly the presence of the typhoid bacillus in water, and even to note if it has been present there for a long time, enables the hygienist to examine a suspected supply before it has done harm, or at least at the start of an epidemic. It especially gives the indication to empty a well, or to allow a piped supply to run off, if the presence of the typhoid bacillus has been demonstrated in the one or the other."

But even though the leakage of the Eberth bacillus downwards from a privy pit into a well be effectually barred, there is proof that it must have been present in the water supplies of farmhouses, where the earth closet was used, and where the dejecta were so situated on the surface as to be readily washed into the well. Thus, in the Report of the Provincial Board of Health, 1898, p.

28, Dr. John J. McKenzie describes an outbreak of typhoid fever in the townships of Hamilton and Hope. There were in all 21 cases and one death. The well water used was incriminated. The reporter says: "The well is situated in the yard near the kitchen; it is about thirty feet deep through clay, and has a good supply. It is not known to go dry. Fifty-seven feet away is the privy-box, a dry-earth affair, which is, however, only cleaned spring and fall. About the same distance is the stable, and the ground around the well is in a very filthy condition." It is not stated that the dejecta of the first cases were deposited in the "dry-earth affair" and subsequently washed into the well; but the inference is that way, since the dirty stable, dirty "dry-earth affair" and polluted surface about the well were of ancient date. Reporting an outbreak of typhoid in East Zorra township, (Report P. B. H., 1896, p. 60), Dr. McKenzie says: "Adjoining the old log house was the privy, which was apparently not a pit or, if a pit, had been gradually filled up. If meant for a dry-earth closet, there was no provision for cleaning it, and it did not look as if it had been cleaned for some time. . . . The corner of the old house next the privy was the room evidently used for cooking, as the stove was there, and portions of the wall towards the privy were wanting, so that there was free access for flies from the privy to the kitchen."

Thus Dr. McKenzie, as early as 1895, expressed the opinion that the Eberth bacillus could be transmitted by flies from dejecta to food, and his theory that the epidemic in question was caused in that way may be correct, though unsupported by scientific evidence. It seems equally probable that the dry-earth closet level with the surface would be equally efficient in supplying Eberth's bacilli, which could be washed by a shower of rain into the well (46 feet away). The water of the well was used for cleaning cooking utensils, etc. As the log house mentioned above was used as a kitchen and milk house, the milk pails, etc., could be infected by the water. The donor of the Eberth bacillus would probably be the daughter, Eugenia, "who did not take the disease, stood the whole strain of nursing, but who had a history of a severe typhoid a year before." Another piece of evidence is the following: "I have just returned from visiting a lumber camp on Lake Wahnapiatae, about eighteen miles from here. The camps are built on a shelving bank, chiefly rock. The excreta of human beings, hogs, horses, are washed into the lake, the cook camp being placed close to the lake from which the water supply is taken, about six feet from the shore. You will not, therefore, be surprised to learn that there are cases of catarrhal enteritis" (P. H. B. Report, 1896, p. 12). The expression "catarrhal enteritis" is probably intended to be

satirical, and a reflection on the diagnosis of some other physician, the writer probably intending to say that in his opinion they were cases of typhoid, and that they were caused by the use of infected lake water. The interesting point is that the infection was washed into the lake from a shelving rocky bank. Anders reports the Plymouth, Penn., outbreak as follows: "In the spring of 1885 a most instructive though deplorable epidemic occurred in Plymouth, Penn., a town of 8,000 inhabitants. At first the nature of the affection was not recognized, and before it ceased to appear twelve hundred persons were affected, with 130 resulting deaths. This epidemic was investigated by Shakespeare and L. H. Taylor, and was found to have arisen from a single case of typhoid occurring in a house on a hill, which sloped toward the water supply of the town. This patient was ill during January, February, and March, while the ground was frozen and covered with snow, upon which the dejecta were thrown by the attendant. On March 25th there was a considerable rainfall, followed by a sudden thaw, and the water, unable to sink in the frozen earth, ran at once through the various surface channels into a brook, which in turn emptied into the reservoir. Coincidentally with the thaw, the patient had frequent and copious stools, and strangely enough for certain reasons the infected water supply was at the same time more largely drawn upon than usual. On April 10th other cases of the disease appeared, and careful investigation showed that these citizens who obtained their water from other sources than the infected reservoir escaped the disease. The causal relation of surface pollution infecting a water supply is very clear in the Plymouth outbreak.

An outbreak which occurred at Ashland, Wisconsin, in 1893-94, is peculiarly interesting in that, in addition to serving as an illustration of the danger of using the same body of water as a place for the disposal of sewage, and as a source of drinking water, it was made the basis of an action at law, which established the liability of water companies and municipalities in cases of sickness and death caused by the distribution and use of infected water. The city's supply is derived from an arm of Lake Superior, Chequamegon Bay, upon which the city is situated. This bay, which is about twelve miles long, and of an average width of five, varies from eight to thirty-six feet in depth. North of the city, and extending outwards in a north-westerly direction, is a breakwater constructed for the protection of the harbor against northerly gales, and between it and the city the mouth of the water intake is located about a mile from the shore. The sewage of the city is discharged further to the west and south. The currents in the bay carry the sewage toward the breakwater and over the mouth of the intake. This condition of affairs was

brought to the attention of the water company by the health boards of the city and state repeatedly, but without results. That the water was polluted was evident on mere ocular inspection, for it was often cloudy or markedly turbid. During the winter of 1893-94 typhoid fever made its appearance in the city, and from the initial cases a disastrous epidemic developed, which led to the establishment of a model filtering plant. The action at law referred to above was brought by the widow of one of the victims. In evidence it was shown that he lived continuously in Ashland, and drank no water other than that supplied by the water company; that previous to his seizure the disease had prevailed in the city and that the discharges from the antecedent cases had passed into the waters of the bay by way of the city sewers. The court found for the plaintiff in the sum of \$5,000.

"The position," says Harrington, "held by water as a causative factor in the spread of typhoid fever is such that, paraphrasing a familiar quotation, the student of sanitary matters may say, 'show me a city's statistics of the disease, and I will tell you the character of its water supply.' Pure supplies and high typhoid rates are quite incompatible; the endemicity of the disease in communities of any large size makes equally incompatible the use of sewage-polluted water and low morbidity and mortality."

There can be no doubt that in the spread of typhoid fever milk plays a part only second in importance to that of drinking water. A very great number of epidemics have been traced beyond a doubt to milk coming from farms where cases of the disease have occurred. The contamination is brought about by the hands of the milkers or other handlers who, in addition to their other duties, are engaged in nursing cases of typhoid fever, or by the addition of infected water, or through washing pails, cans and other utensils in such water. In the Report of the Provincial Board of Health, 1886, p. 23, Dr. Griffin, M. H. O., Brantford, says of an outbreak of typhoid fever in different families: "It was found in the second and third houses attacked, in which were seven of the ten cases, that milk was obtained from the same salesman, and this milk was found to have an unpleasant taste. On visiting the dairy, it was found that the well from which water was got for rinsing the utensils was only eight or nine feet from the cow stable and from a large heap of manure, in such a position that it was impossible that the well should not be contaminated."

Dr. James B. Russell, M. H. O., Glasgow, also mentions that impure well water extended pollution to the milk, causing, in a population of 905 people living in Fergushill and Benson, 100 cases of enteric fever during two years.

As is the case when outbreaks occur from polluted water, when attention is drawn to the possible cause, the bacteriological evi-

dence has not been obtainable, the conditions having changed during the period of incubation. The discovery made by Chantemesse will, however, remove this difficulty.

"That the bacillus of Eberth can retain its vitality in milk, and even in sour milk, has been definitely settled. Hein found the organism in sour milk at 55-64 F. after thirty-five days, but not after forty-eight. Hesse has found it in sterilized milk after four months. Drs. Frankel and Kester, having reason to believe that the unusual amount of typhoid fever at Hamburg during the summer of 1897, was due in part to infected buttermilk, undertook the study of the question whether the bacillus typhosus can exist in that fluid. Obtaining some samples, they first investigated the number and identity of the contained bacteria, and learned that while the number varied widely the species were always about the same. Finding no pathogenic organisms, they sterilized specimens in test-tubes a half hour a day for three days, then planted the typhoid bacillus in them and kept them at different temperatures—on ice, and at 22 and 37 C. (71 3-5 and 98 3-5 F.).

"Loops were taken from each from time to time and planted, and each yielded positive results. The specimen kept at room temperature was under observation nine days, the others were not examined after the third. Then specimens of fresh buttermilk containing all its bacteria were planted, and kept under the same conditions, and from them the same results were obtained. Yet there was this difference, that there was always a diminution in the number of pathogenic organisms, and this was the more marked and sometimes very rapid with increasing temperatures" ("Practical Hygiene," Harrington).

In 1896 the French Academy of Medicine took official notice of the connection between infected oysters and typhoid fever, and came to the conclusion that suspected oysters may be made safe by removal for several days to pure sea water, away from all possible chance of contamination. According to Dr. Klein, the time which should elapse is at least sixteen days. He found that the bacilli in typhoid-contaminated oysters were harbored from four to sixteen days after removal to clean water. Dr. Newsholme, in *Public Health*, September, 1898, after a thorough investigation of the subject, concluded that no less than 30.7 per cent. of the total number of cases of typhoid fever in Brighton, England, in 1897, were definitely traceable to the eating of sewage-contaminated oysters or mussels, and that the percentages in other years were 38.2 in 1894, 33.9 in 1895, and 31.8 in 1896.

Other solid forms of food, such as salads, celery, fruits, may be contaminated by infected water or dust, or by the fingers of the nurse or the patient. Instances of contamination from such sources must, however, be rare.



During the Spanish-American war in 1898, it was thought that the Eberth bacilli were conveyed from the latrines directly to the victims or to the kitchens and mess-tables by swarms of flies (Anders).

A similar observation has been made to myself by an official engaged in a railway construction camp in British Columbia, in which the laborers were attacked with typhoid fever, although the water supply was reported to be quite pure.


The presence of fecal dejecta in open trenches connected with camps, during hot weather, when flies abound, must necessarily expose the food to grave risk of infection with typhoid fever. Among large bodies of men drawn from different parts of a country in which this disease is very generally distributed, it is almost inevitable that there will be some who will introduce the germ.

Finally, we must not forget that typhoid may be conveyed by direct contagion. The disease is occasionally contracted by nurses and physicians. Laundresses, who are obliged to handle soiled clothing, are affected frequently. Anders says that "during the presence of an epidemic in 1897 in Montgomery County, Penn., house epidemics occurred, in which contamination of water or food could be excluded with reasonable certainty."

As the experiments of Dr. Eduardo Germano negative the transmission of typhoid fever by dust, blown about by the wind, I shall not mention them.

"Within the past decade the water theory of typhoid infection has been so thoroughly proved as the chief, if not the sole, cause of extensive outbreaks, that interest in Pettenkofer's theory has fallen off, and its supporters are now few in number" ("Practical Hygiene," Harrington).

Sewer gas is not now regarded as of much importance in causing an outbreak of typhoid. If house plumbing be defective, Eberth bacilli may escape into the atmosphere of homes. Sewer gas of itself, is often unpleasant, and though it is deleterious, it cannot of itself cause typhoid fever" (Bergey and Abbott).

*Pharmacology and*   
IN CHARGE OF  
A. J. HARRINGTON, M.D., M.R.C.S.(Eng.) *Therapeutics.*

INDOLENT VARICOSE ULCER OF THE LEG.

ELIZABETH B., aged about fifty, came under my care about February 1st with a severe ulceration of the right leg, for which she had been a sufferer for some years, rendering her almost unfit for work of any kind. On examination, I found the entire leg from the knee down very angry and red, the veins being greatly varicose, and knotted in several places. There was, about 1 1-2 inches above the internal malleolus, a large unhealthy-looking ulcer, irregular in outline, with thick, everted and swollen edges. I found the swelling would pit upon pressure, due to an edematous condition present from a point midway between the knee and ankle to the metatarsal region. Unlike the tubercular ulcer, the edges were not undermined, but sloped gently to the floor of the ulcer. The floor was covered with large, unhealthy granulations, which bled quite freely on pressure. The ulcer was surrounded, in fact the whole lower leg was covered, by eczema. The ulcer was about two inches by three inches in diameter. My patient told me that she had used everything in her power to heal the "sore," but had found it impossible to "get it any smaller." She had consulted several doctors, but evidently without avail, and came to me to ask whether it might not be wise to have her leg amputated, the pain at most times being excruciating. On questioning her about how the ulcer started, and what it looked like at first, she said that it started like a reddish ring, and "worked towards the centre," a condition which in varicose ulcers is quite common, the destruction of tissue beginning at the margin of the congested area, and advancing towards the centre. In this case, on closer examination, it was easy to notice that the veins ran beneath the ulcer, and from its upper margins to the inner border of the popliteal space. There was a condition present of passive hyperemia, all the surrounding tissues being saturated, so to speak, with the thin serum oozing through the walls of the smaller veins and capillaries, causing the severe edema present. The extensive pigmentation of the skin was due to the exudation of red corpus-

cles, and with the nutrition of the part enfeebled, it is little wonder that the slight blow which, as in this instance (tripping upon the stairs) originated the trouble, first by causing an abrasion of the epidermis, the minute wound gradually developing into an ulcer of considerable size; infection then taking place by bacteria invading the exposed surfaces, and the surrounding parts becoming infiltrated with leucocytes. There was a certain amount of phlebitis also present in this case, making her suffering all the more severe.

The question then arose, what was to be the form of treatment? I ordered my patient to bed, and told her that she might expect to spend the following three or four months anyway on her back. I elevated the leg upon two or three hard pillows, in addition to raising the foot of the bed itself upon two bricks. I administered a saline every morning at the start. As she had a rheumatic diathesis, I put her upon the salicylate treatment, using drachm doses of the elixir of compound salicylates and manaca three times daily. I scarified the bottom of the ulcer and the skin, taking care that each cut went through the deep fascia. This caused a certain amount of hemorrhage, and thus relieved the severe pains, which were more prevalent at night. The incisions permitted contraction to take place and allowed granulations to sprout in them, thus assisting the absorption of the exudate. Two days after scarification, I scraped the ulcer with a curette until I reached sound tissue. I dressed with iodol once daily. At first healing seemed to become established, and I had hopes that everything was progressing. The patient said that she had less pain in the leg, and was decidedly more comfortable than she had been in years, sleeping better at night and eating better. The eczema began to disappear at the same time. After instructing her how to do the daily dressing, I gave up calling oftener than once a week. After a month had elapsed, I got a little impatient, and changed the dressing to equal parts of boric acid and bismuth. Later I applied sulphate of copper to the granulations, as they seemed a little exuberant, following that application for a few days with hot lead-water and laudanum. No progress took place in the healing process at all, the sore seemingly remaining stationary in size, as well as in depth. At various times I used the actual cautery. I applied silver nitrate daily (10 or 15 grains to the ounce). I strapped the edges with adhesive plaster, but all seemed of no avail. At the end of the fourth month I commenced using poultices of antiphlogistine, and, after healing was established, dusted on special protonuclein powder. I took the former, and with the ordinary spatula, applied it warm to the entire leg from the knee to below the ankle joint. I put it on about the thickness of an eighth of an inch all over, afterwards covering the leg with heavy

cotton. In thirty-six hours it peeled off like putty or a banana skin, leaving the skin beneath clean, and with a decidedly less angry appearance. I reapplied antiphlogistine three times a week and kept on doing so for just six weeks. At the end of that time, the ulcer had almost closed over, and I from that date used an ordinary gauze dressing, on which was dusted special protonuclein powder. To-day the patient is well and going around without suffering any pain. It seemed to me that antiphlogistine acted as an antiseptic, soothing ointment, and by its hygroscopic powers reduced the edematous condition of the leg to one of a normal, rapidly-healing granulating surface.

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### THE TREATMENT OF GONORRHEA WITH ICHTHARGAN.

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Dr. MORITZ FURST,\* of Hamburg, reports the results which he obtained with ichthargan in the treatment of gonorrhoeal urethritis. He employed it in 75 cases, both in dispensary and in private practice. He says that in spite of the superabundance of antigonorrhoeal remedies, we have a perfect right to investigate any new compound, if its chemical composition is of such a nature as to warrant the belief that it will prove effective in the treatment of that obstinate affection. That ichthargan—a combination of the well-tried and proven silver nitrate with the bactericidal, siccative, and anodyne ichthyol—is such a compound, theoretically at least, no one will deny. And practical results fully justify the *a priori* expectations.

Of the 75 cases treated by the author, 26 were first cases, while 49 were suffering from the second, third, etc., attack of gonorrhoea. Of these 6 were cured in from 5 to 8 days, 24 in one to two weeks, twelve in three to four weeks, and 13 in more than four weeks. Of the last 13 cases, the author considers four cases not cured because they still have a slight discharge, though free from gonococci. All the other cases were entirely cured.

The ordinary method of using the ichthargan was by means of injection. The patients were directed to use solutions of 1-3rd to 1 grain of ichthargan to 7 oz. of water. The stronger solutions were given in the beginning in acute cases with purulent discharge full of gonococci; the weak solutions were used toward the end as an astringent. The patients repeated the injections 4 to 5 times a day, after urination, and they were instructed to retain the solution for 5 to 10 minutes. In cases in which the posterior urethra was affected, 6 to 10 drops of a 3 per cent. ichthargan solution were instilled by means of Guyon's urethral syringe.

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\* Deut. Med. Wochensch., 1901, No. 14.

The superiority of this solution over nitrate of silver was at once apparent, as the pain was much less, and the constant irritation and desire to urinate which are produced by silver nitrate, were absent. The author also used ichthargan in the form of suppositories, made up with cacao butter, and containing from 3-4th to 1 1-2 grain of ichthargan each. As a prophylactic after suspicious coitus, the author advises the instillation of 3 to 4 drops of a 10 per cent. solution into the fossa navicularis. The author considers ichthargan, on the whole, a most excellent antigonorrhoeal, greatly superior to protargol, with which he has also had extensive experience.

In conclusion, Dr. Furst calls attention to the fact that, taking into consideration the high percentage of silver in ichthargan—containing, as it does, 30 per cent. of silver, while protargol contains only 8 per cent.—and the potency of the drug, which makes even very weak solutions effective, it is the cheapest of the organic silver compounds used for antigonorrhoeal purposes.

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#### COCAINE MURIATE IN WHOOPING COUGH.

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THIS is one of the most useful drugs which has come before us in many years for this most troublesome complaint. I have used cocaine since 1895 in this disease, and it has given me most satisfactory results. My attention was first called to it by an article in the *Lancet*, June 8th, 1895, by Drs. S. Russell Wells and L. J. Gerard Carre. The usual dose to begin with is, at six months of age, 1-16 of a grain three times a day, and gradually increase up to the required influence of the drug, or to toleration. For an infant at one year, begin with 1-12 of a grain three times a day. For a child 3 years begin with 1-5 or 1-4 grain three times a day, and as before increase to 1-2 grain three times a day, or more. In adults, begin with 1-2 grain and increase to one grain. A great deal has been written regarding the dangers of cocaine muriate, but I have seen no alarming symptoms beyond a feeling of ecstasy in one patient from using a 6-grain rectal suppository, and in several children I have noticed, or my attention has been called to the fact by the parents, that the child has seemed very talkative after its administration.

The distressing vomiting ceases after the first dose usually. The paroxysms are lessened in severity, and are noticeably much further apart, and the disease is usually aborted in from two to three weeks. The most satisfactory result is obtained in nearly every case from the administration of the first dose. In the case of children, I usually give a subsequent course of syr. phos. comp.

A. J. H.

## Selected Articles.

### LINEN UNDERWEAR.\*

BY DR. HENRY W. ROBY.

LADIES AND GENTLEMEN,—Before discussing abdominal growths I wish to discuss briefly, by way of prelude, some external conditions that have a direct bearing on the internal conditions of the abdomen. Here is the greatest cavity in the human body, with strong, heavy walls behind it and thin, flexible walls in front, where God forgot to put any bones. That chamber is the great chemical laboratory of the body, in which substantially all the nutritive elements of the whole body are transformed and prepared for absorption into the constructive and reparative processes of the body. And I need not tell you that an even and sustained temperature is always necessary in that great chamber. Anything that contributes to an abnormal temperature either above or below 98 2-5 degrees, or anything that causes frequent fluctuations of temperature is pernicious, and I scarcely need tell you that the matter of clothing has a tremendous influence for or against the healthy activities of the body.

Broadly speaking, from the sanitary standpoint, there are only two kinds of clothing—*good* and *bad*; and in each class there is another division—*outer* and *inner* clothing. For in this day practically everybody outside of the tropics wears two sets of garments *outer* and *inner* garments. And I shall devote this chapter of my discourse to the *inner garment*. I think that even the medical profession has been for many years woefully in the dark as to what is the *very best* kind of under-clothing. The fact is, that we have not, as a whole, given the subject that careful and scientific study that its importance demands. I am unable to recall a single precept from any professor on that subject in the college where I graduated. And it is equally impossible for me to recall any paper or discussion in any medical society meeting that I ever attended on the science of underwear. Is it possible there is no such science? I cannot so conclude, for there is a science in every-

\*An inter-current lecture in the course on Abdominal Surgery in the Kansas City Homeopathic College.

thing that concerns life and health. Science is but the ascertained truth and classified knowledge. Truth may be unascertained, but when it is apprehended it becomes science to us. It must be conceded that that kind of undergarment is best that promotes the greatest degree of health and comfort. And I think I can demonstrate to you, and to all thoughtful physicians, the fact that *linen* is the most highly scientific and sanitary of all underwear.

I think I have made a more careful and extended study of the subject than most men, and every fact that I have found points the same way. I have tested, I think, every kind and quality of underwear in the market. I have worn wool in all its varieties and forms of fabrication. I have worn cotton till there was no other variety to try. I have worn shoddy and chamois. I have worn flannel, silk and satin. I have worn hair cloth huckaback, and all the mixtures of these several materials, but I never found anything to equal pure linen for comfort and health.

The garment most frequently worn and most outrageously unhealthy of all is cotton. The only thing that I know of to commend it is its cheapness. It is cheapest of all to the purse and dearest of all to the person. It is responsible for more colds, coughs, rheumatisms, neuralgias, and more cases of lowered vitality and mal-nutrition than any other fabric. There is nothing more clammy and soggy and chilling and choking to the capillaries than a suit of cotton underclothes. In cold weather it is cold. In hot weather it is hot. In moderate weather it is always damp and sodden, like those who dwell in a London fog. It takes up slowly the sensible as well as the insensible perspiration of the body and holds it in a thin film of dampness next to the skin longer than any other material, and the shock to nerve filaments and capillaries in the skin is profound and prolonged.

Woolen underwear is a grade better than cotton, but it, too, holds the body wrapt in a wet pack most of the time in all but the very coldest weather, and in warm and hot weather it soaks and steams the skin until it becomes exceedingly sensitive and tender, making it exquisitely sensitive to the least change of temperature and prone to many eruptions.

The great disadvantage of all cottons and wools and their several mixtures, is that they all take up moisture from the skin slowly and yield it slowly to the surrounding atmosphere, thus enveloping the body in a wet and chilling envelope, which prevents normal transpiration from the skin. That condition produces abnormal chilliness and contraction of the surface, the blood recedes from the capillaries, the nutritive function is diminished, and if long continued, that condition is reflected to other and deeper structures of the body, and we get that most common and most dangerous and most misunderstood of all human ailments—a *bad cold*.

Did any of you ever see a *good* cold? I never did. Every cold that ever afflicted mankind was contracted through chilling the surface capillaries, shocking the peripheral nerves and depressing the normal calorific state of the body. Nobody ever had an *internal* cold nor any other that did not originate in capillary, chill and depression. A very great number of nutritive derangements follow directly and consecutively upon a chilled state of the surface capillaries. Many a glandular engorgement and consequent enlargement and tumefaction results from the same cause, and many an internal neoplasm has been inaugurated and initialized by an external depression of body temperature. Much of the work of the abdominal surgeon is originated in this way. And so much more depends upon *underwear* than on *overwear* that it is a matter of amazement that more attention and critical study has not before now been devoted to the subject by physicians.

It is a very plain and undeniable proposition that there is always *one best* thing where there is a variety of things to choose from for any specific purpose. So in this matter there is one *best* material for underwear from the sanitary standpoint. And I mean by sanitary, life-giving and life conserving and life prolonging, and if there is one *best* thing for that purpose why do not all men have it and wear it? Because scientific studies have not been directed sufficiently along the lines of personal hygiene.

After years of experiment and study I have no hesitation in proclaiming to you, and to all men, that the best underwear is that which clad the ancients before the discovery of cotton, and when men lived close up to the age of Methuselah. And why? Because linen for the best of reasons is most highly endowed of any known article of apparel with the power of *transpiration*. It can take up more water in a minute or an hour from the surface of the body and pass it on more rapidly and lavishly to the external atmosphere than anything we know of except blotting paper. And blotting paper has not yet been made into underwear.

The function of human perspiration has two physiological objects. One is to keep the skin from becoming too dry for elasticity (but the oil or sebaceous glands in the skin do most of that), and the other is to regulate calorification. When the bodily temperature rises a few degrees, as in active physical exertion, the skin is bathed with a copious flow from the sudorific glands, and the rapid evaporation of that flow cools the body, and that rapid evaporation takes place only when the body is naked or covered by a transpiring garment. To take up that flow and pass it on rapidly to the air is the function of the best garment. Linen does that better than all other clothing.

My attention was first drawn to this fact forty odd years ago in a curious fashion. My father was a frontiersman in the wilds



of Wisconsin as early as 1847, and I have known the dried hams of twenty-five or thirty deer to hang on our cabin walls at one time at the close of the hunting season. Bear meat was also abundant. And one of my father's companions in the chase, was a long-headed old Irishman named Hare, and known the country round as "Uncle Jim."

When winter set in Uncle Jim and father would stock up the big covered wagon with good things to eat and go into the pinery for a hunt, and they often brought back a wagon load of venison and bear meat, with antlers and skins enough to buy the summer's groceries.

And it was noticed and commented on that Uncle Jim wore less clothing than any other hunter in that part of the country, and he always seemed to be in finer physical condition than anybody else. A heavy red flannel shirt, with a loosely-knit flannel "warmus," served him for vest and coat and overcoat, and one day when the thermometer was crouching at twenty degrees below zero Uncle Jim came to our house in his usual garb and I asked him why he never wore an overcoat in winter. He replied in strong Irish accent, "Ah, lad, its me linen that kapes me well enough for two men." "Linen!" I retorted, "where's the linen?" Then he told me he wore a linen undershirt and drawers, with the heavy flannel overshirt and trousers, and never knew what it was to be cold or to have a cold, and that his "warmus" served the place of an overcoat when it was very cold or stormy.

And Uncle Jim was the only man I ever saw in linen underwear until five or six years ago, and during all that time I struggled and suffered on as so many thousands of others did, and do now, with the wretchedly unsanitary underclothing of the country, creeping from one cold to another, and from one discomfort to another, from bronchitis to bronchitis, from pneumonia to pneumonia, and making one catarrh last well on towards a life time. And then one day I made a discovery. I received a circular announcing the manufacture and sale of linen underwear by a doctor in New York. All at once Uncle Jim Hare, whom I had not seen or thought of for years, came to my mind with his quaint brogue saying, "Ah, lad, its me linen that kapes me well enough for two men." I discovered in that circular that Dr. Deimel, of New York, had started the fashion of linen underwear in this country, and as I was just then hunting for something that could be honestly called "sanitary" in underwear, I ordered a supply of the Deimel Mesh linen underwear, and have been clad in it ever since. And with me the problem of "sanitary underwear" has been solved.

Dr. Deimel has done mankind a much greater service than merely recalling attention to the wholesomeness of linen as a companion garment to the skin. He has invented a method of weaving

the linen so as to very greatly increase its normal capillarity and porosity, its absorbing and exhaling power. And as there is no secret about it I may tell you that his process simply involves the weaving of the cloth in open meshes, much in the manner of window and door screens. This porosity and capillarity, plus an affinity for water that makes the good pad of blotting paper take up instantly more than its own volume of water, and almost as rapidly hand it over in impalpable and invisible mist to the atmosphere, which is nearly always thirsty and except in very wet and very cold weather is always sucking enormous quantities of water from man and beast and tree and shrub and field and flower. Apparently the most thirsty thing in the universe is air. It drinks and drinks until it can hold no more, then pours it back on the earth and drinks again until everything has been sucked dry, and we deplore the "great drouth." It is this great absorptive capacity in Deimel linen that makes it come so near to doing for the body what the air does for the earth. It keeps normal moisture in a state of constant transference and it never allows any stagnation. When surplus water stands for more than a short time on any field or meadow the normal fertility of the soil is drowned and lost, and the crops perish. And so, where the human cuticle is subjected to a surplus of moisture it loses its vitality and its normal functions, and disease results.

While linen is the king of all fabrics for undergarments the Deimel Mesh in, the woven fabric enhances its transpiring powers very greatly over the close woven, flat web of ordinary linen.

When you wash the face and hands you always wish to dry them quickly, and you never try a cotton towel for that purpose but once if you can get a linen one, on account of its much greater affinity for water, and you never think of using woolen or silk towels because they are not endowed with the power and quality of exosmosis in any comparable degree with linen and the Deimel linen excels all other linen in its exosmotic properties on account of the honey-comb method of its weaving.

Before I began wearing Deimel linen I was always taking cold and suffering all manner of discomforts from it. I always wanted my office temperature up to 80 or 90, winter and summer, and I now know why. The high artificial temperature gave me a dryer air and therefore a thirstier air and one which more greedily wrung or sucked the moisture out of my soggy cotton or woolen underclothes. As soon as I put on the Deimel Mesh linen I could sit comfortably and safely in a temperature of 20 to 30 degrees lower and take no cold, and have no fear of feather-moving draughts. And I enjoyed better general health than I had done for many years. My linen garments cost me several times as much as cotton, but it greatly improved my health and comfort and saved

me 20 per cent. on the winter's coal bill. I was not wasting my own bodily heat trying to dry out a layer of soggy underwear all over the body. Instead of being in a continual state of contraction from dampness and its consequent chilling, my capillaries assumed their normal calibre, and carried plenty of fresh warm blood all over the surface of the body. And comfort was the paramount sensation.

I think that from sanitary and economic reasons we shall yet get back the regime of the ancients who lived from 100 to 900 years. In those halcyon days of the race everybody wore linen. After the primitive fig-leaf and the skins of animals, linen was almost the universal garment of the race for many generations. The Bible is full of allusions to flax and linen. As early as the exodus we find Aaron and his sons set apart and dedicated to the priesthood. Their costumes and paraphernalia are described minutely, and among other things the costumers are commanded to make holy garments for glory and for beauty, of gold and blue and purple and scarlet and *fine linen*. The ephod should be of *fine twined linen* with cunning work, and his curious girdle was to be of *fine twined linen*. His breast-plate was to be of the same. He was to have an embroidered coat of *fine linen* and a mitre of *fine linen*, and the priests were to have *linen* breeches to cover their nakedness.

In Leviticus we are told that the priest shall put on his linen garment and his linen breeches. Both in Leviticus and Deuteronomy the priests received this injunction: "Neither shall a garment of linen and woolen come upon thee."

Samuel ministered before the Lord in Linen, and he tells us that on a certain day Doeg "slew four score and five persons that did wear a linen ephod."

St. John says he saw seven angels coming out of the temple clothed in pure white linen.

Russia is a very cold country, and yet nearly all Russians wear linen underclothing, and are a race of superbly healthy people.

"Shesh" is a very old Egyptian word meaning fine linen. All the old Egyptian mummies we dug up are wrapped in "shesh." And pieces of linen fabric are now in existence that were woven 4,000 years ago. As far back as history shows anything of the habits of the Anglo-Saxons they wore linen under and woolen over garments. And the great Charlemagne, his historian tells us, was dressed after the fashion of the Franks, in linen underclothes.

One writer tells us that the origin of linen underwear is lost in the cloudlands of history, it is so ancient.

So common was linen apparel in England in 1357 that a statute was passed declaring that laborers in husbandry should only wear a blanket and russet and girdle of linen unless they

owned more than forty shillings worth of property. And if, as Swedenborg tells us, human garments denote states of wisdom, and are therefore much spoken of in the Bible, then linen should be the garb of all wise men.—*Medical Arena.*

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### THE AMERICAN PEDIATRIC SOCIETY.

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ANNUAL MEETING HELD AT NIAGARA FALLS, N.Y., MAY 27, 28,  
AND 29.

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THE following extract is from *American Medicine* of June 8th, 1901.

"A number of interesting discussions took place on the feeding of sick and well children, with special reference, as might be assumed, to the question of using cereals and various forms of modified cow's milk.

"One of the most noteworthy papers was that contributed by Dr. Charles Gilmore Kerley (New York), who gave the conclusions drawn from a study of 555 cases of summer diarrhea. Out of the total number, only 10 died. In other words, the death-rate was a little over 2 per cent., and this, the author of the paper said, showed the enormous extent to which mortality from this cause is preventable.

"After explaining that the cases were all taken from the homes of the poor, the Doctor proceeded to say that at the Babies' Hospital they had but one rule of treatment. Irrespective altogether of the duration of the complaint, or of whether the child was being fed on the breast or not, they always cut off the milk at once. Not only did they advise this, but they said positively that the milk must be discontinued for a few days or they would not treat the case."

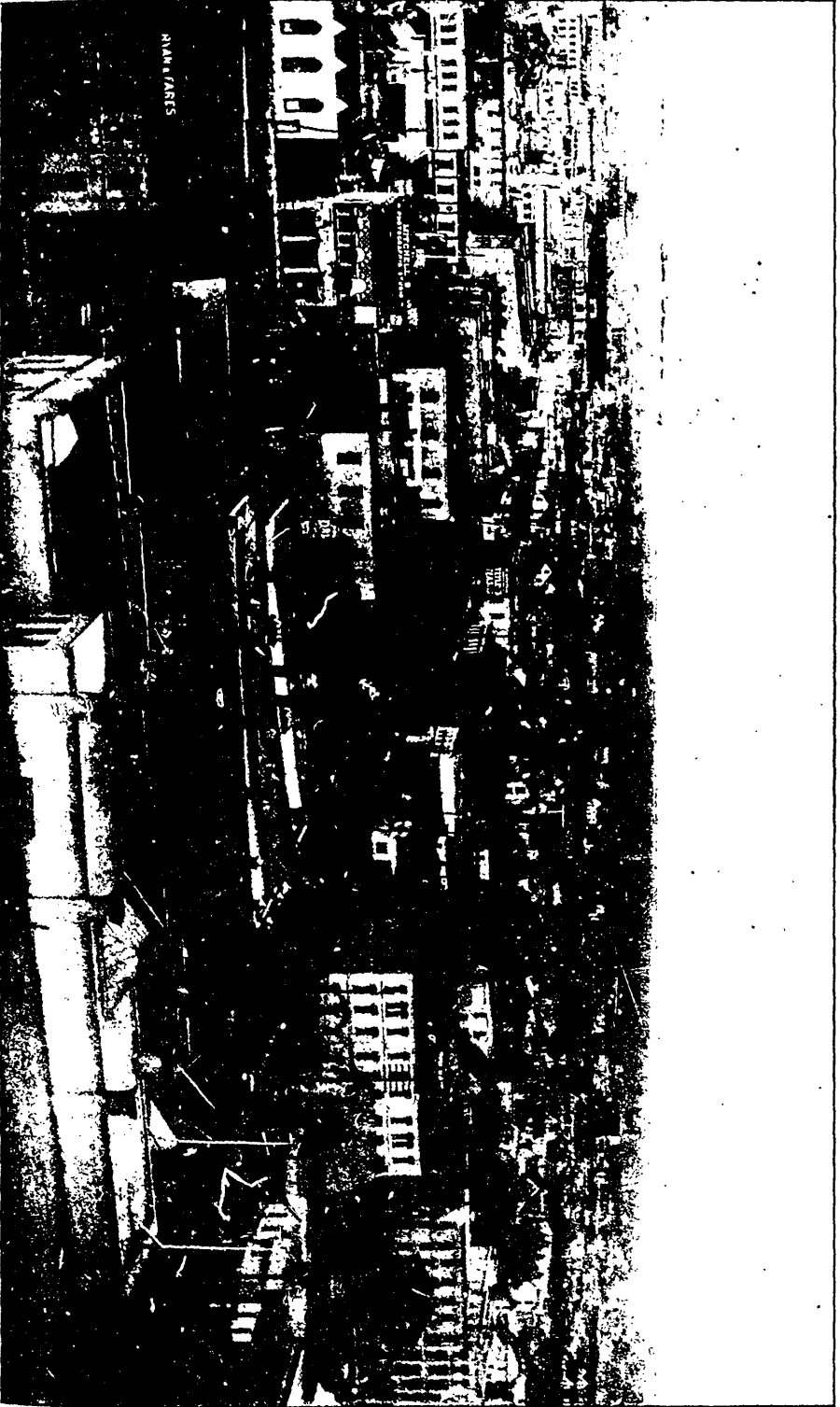
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THE following is an exact copy of an epitaph on a tombstone in a New Hampshire cemetery. It explains itself: "Ruth Sprague, dau. of Gibson and Elizabeth Sprague. Died Jan. 11, 1816; aged 9 years, 1 mon. and 3 days.

"She was stolen from the grave by Roderick R. Clow and dissected at Dr. P. M. Armstrong's office, in Hoosick Falls, from which place her mutilated remains were obtained and deposited here.

"Her body dissected by fiendish men,  
Her bones anatomized,  
Her soul, we trust, has risen to God,  
A place where few physicians rise."

—*Atlanta Journal Record.*



WINNIPEG, MANTOON, MEETING PLACE OF THE CANADIAN MEDICAL ASSOCIATION FOR 1901.



BOY RIVER FALLS, BANFF, ALBERTA.



CHALET, AT LAKE LOUISE, NEAR LOGAN, ALTA.

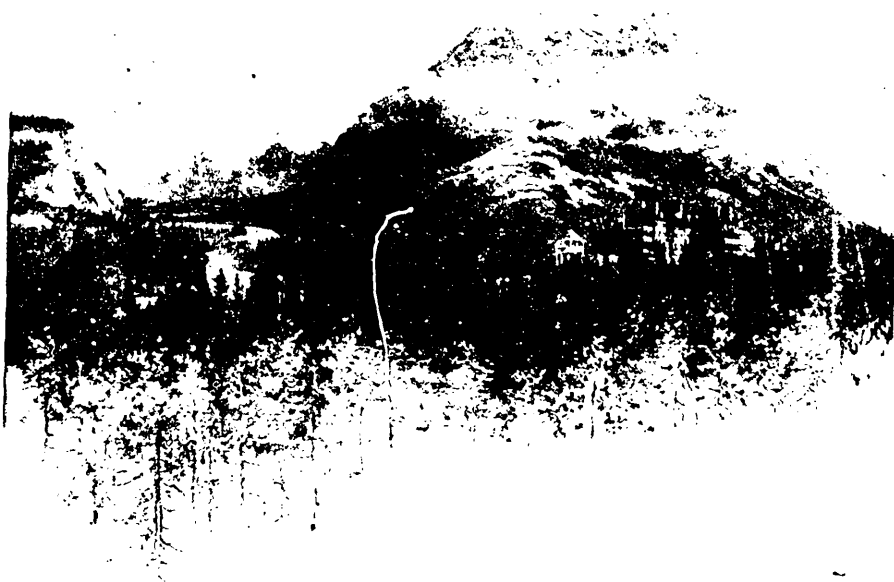


LAKE MANSER, NEAR TORONTO, ALTA.





BOW VALLEY, FROM BANFF HOT SPRINGS HOTEL.



BANFF HOT SPRINGS AND BOW VALLEY.



IN THE SELKIRK TANGI



THE GREAT SELKIRK GLACIER.



GREAT GLACIER AND HOTEL, GLACIER, B.C.

YOHIO VALLEY, NEAR FIELD, B.C.



MOUNT STEPHEN, FIELD, B.C.

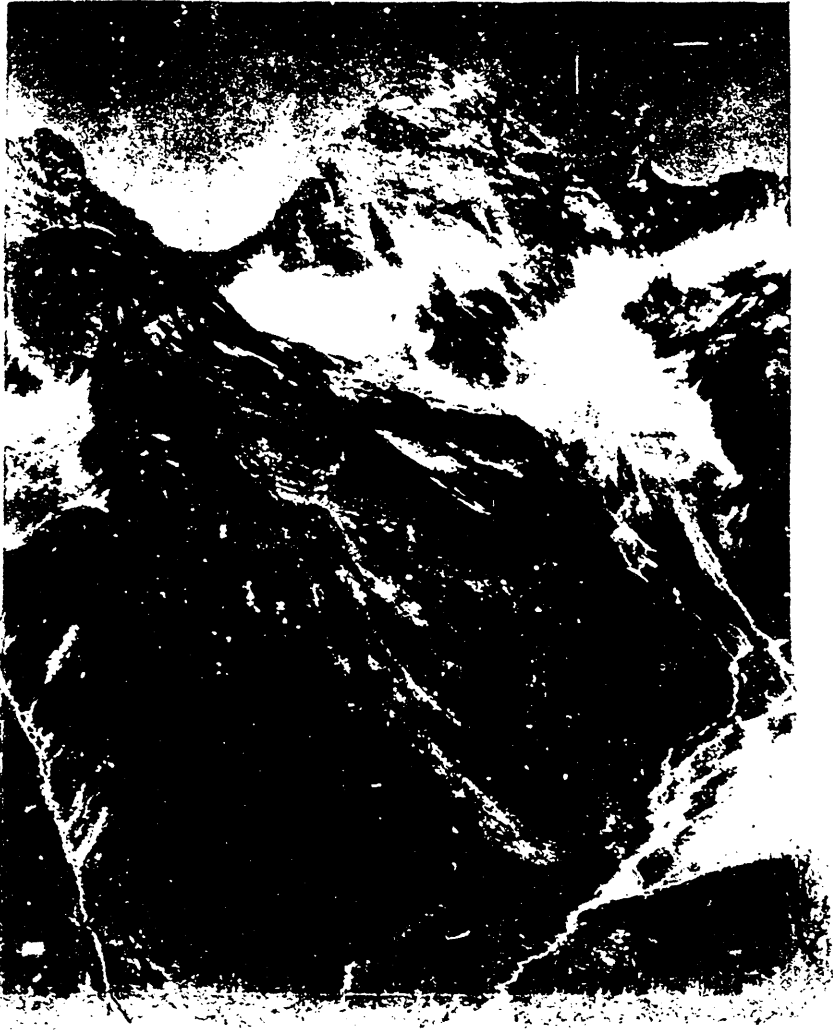


YOHO VALLEY, NEAR FIELD, B.C.



TAKAKKAW FALLS, YOHO VALLEY, NEAR FIELD, B.C.





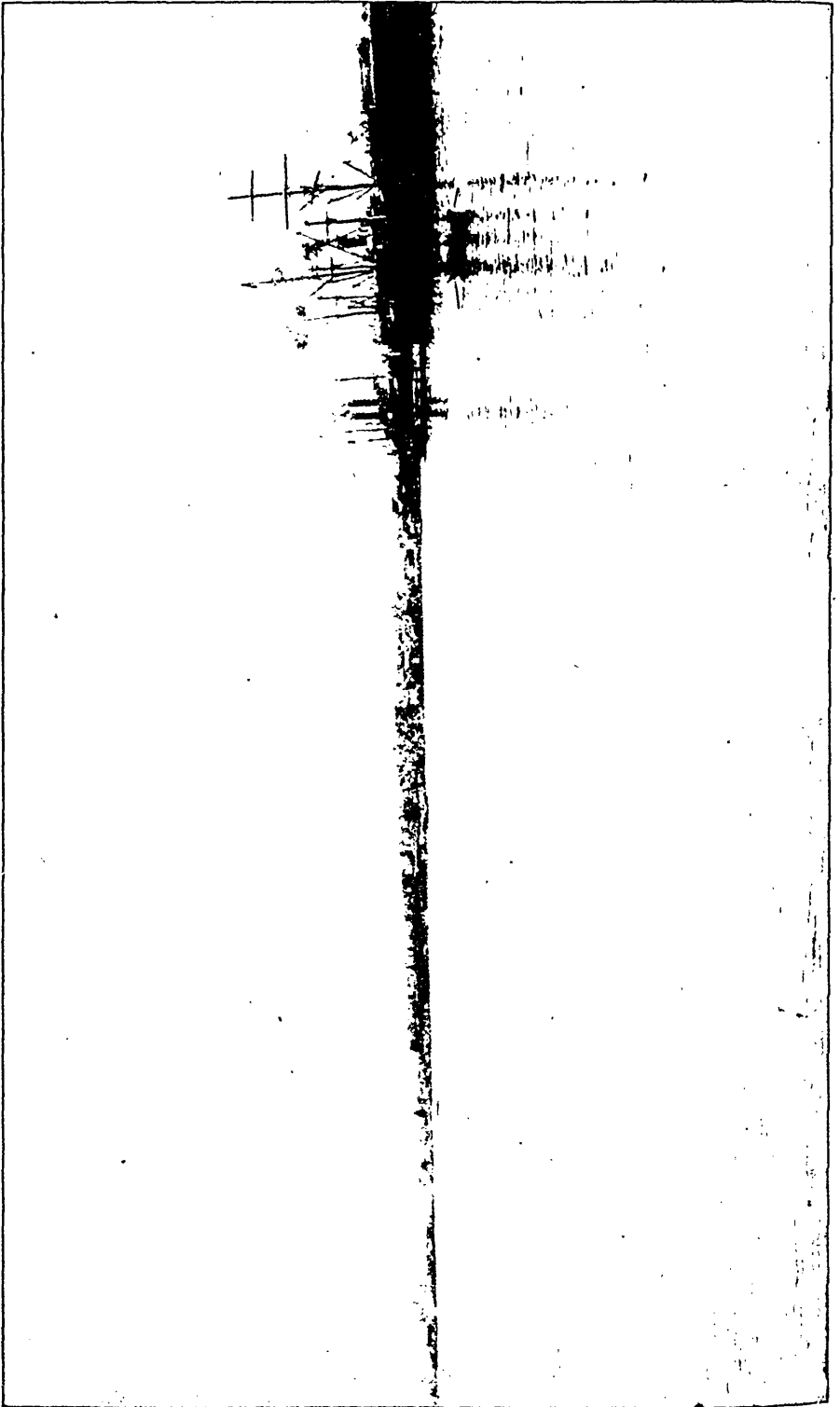
MOUNT SIR DONALD.



MIRROR LAKE.



BEE-HIVE MOUNT.



# The Canadian Journal of Medicine and Surgery

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Address all Communications, Correspondence, Books, Matter Regarding Advertising, and make all Cheques, Drafts and Post-office Orders payable to "The Canadian Journal of Medicine and Surgery," 145 College St., Toronto, Canada.

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

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

VOL. X.

TORONTO, AUGUST, 1901.

NO. 2.

## Editorials.

### PROMPT DETECTION OF THE CAUSE OF TYPHOID FEVER IN POTABLE WATER.

THE very important paper read by Professor Chantemesse at the regular meeting of the Academy of Medicine, Paris (June 4, 1901), gives the outcome of fifteen years of work in searching for and definitely recognizing Eberth's bacilli in potable water. The new method enables a bacteriologist to discover the bacillus

typhosus, if present in a sample of water, and then to declare if it has been present therein for a considerable period of time.

We shall not endeavor to describe the technic of Chantemesse's method further than to mention that the chief agents used are two different culture media; (1) a medium for producing the proliferation and regeneration of the microbes, and (2) a culture medium for differentiating Eberth's bacilli from the other microbes which may be present in the sample of water examined. The complete description of this method appears in *La Presse Medicale*, June 4, 1901, upon which these remarks are founded.

In alluding to the failures to discover the Eberth bacillus in suspected water, which have so frequently been noted in medical literature, and even quite recently, Chantemesse becomes gently satirical. He states that the failures depended on a preconceived and inexact notion in the minds of the searchers: they looked for the Eberth bacillus very much as though it were an inert foreign body, incapable of modification, similar to an unchangeable and chemically defined crystal." Chantemesse has specially studied the modifications of the Eberth bacillus, the departures from the classic type, and the defaced forms which it assumes when placed in an unfavorable medium, to which it is obliged to adapt itself in order to maintain its existence for a considerable time. He shows that shortly after its introduction into potable water, it begins to live as a saprophyte, but that after suitable treatment by an observer its ordinary characteristics may be made to reappear. It may be made to proliferate, to increase in numbers and in strength, and to renew its youth, so that it may easily be differentiated from the other microbes contained in potable water.

Chantemesse does not apply his method to the microbes contained in a few drops of a suspected water, but to a large quantity of such water, and afterwards introducing all the microbes contained therein into a second culture medium, a medium for differentiation, he claims, that the typhoid colonies reassume their particular objective characters which may be easily perceived and recognized in three or four days.

The conclusions to be drawn from this discovery are of very general interest. As this method enables the bacteriologist to discover rapidly in water the presence of the Eberth bacillus, and even to ascertain if it has been present in it for a long time, a suspected supply may be tested before it has done any harm, or

at any rate, at the beginning of an epidemic. It will thus enable health authorities to suppress the use of water taken from a well, or a public supply in which the presence of the bacillus typhosus has been demonstrated.

The origin of typhoid fever from the use of impure water is also proved to be due to the presence of the Eberth bacillus in the water consumed. The number, and especially the qualities, of these bacilli are, however, very valuable; in some instances they are numerous and virulent, in others few in number and of little strength. Chantemesse says that, in instances of the latter kind, "the secondary conditions, operative in the evolution of typhoid fever in an individual, viz.: overwork, great bodily exhaustion from insufficient food, etc., and perhaps a particular quality of the intestinal flora (estivo-autumnal), are of the greatest importance. These conditions, observable in certain individuals, realize in the Eberth bacilli which they have swallowed something analogous to the influence of a favorable culture medium, in which the proliferation and regeneration of the bacillus typhosus are effected.

Professor Chantemesse states that he has applied his method in searching for Eberth's bacilli in typhoid stools, and has often demonstrated the presence of these microbes in them. J. J. C.

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#### A WARM WEATHER DIET.

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SPEAKING broadly, one may say with perfect truth that a diet suitable for cool weather will not meet the requirements of a torrid season, such as prevailed in America during the last week of June and the first week of July. In cool weather meats and fats, being required by the organism, are eaten with genuine pleasure; in summer they are not required to the same degree, and are apt to cloy. Still, so inconsistent are we, or so much the slaves of habit, that, if compelled to abstain from the roast and broiled, through lack of appetite, we stimulate our nerves of taste to enable us to take a kind of food which we do not really require. In hot seasons, beef, lamb, and veal should be used in moderation, if at all; Chicken and fish should be substituted, together with green vegetables, fruits and bread. The use of lettuce salad at the evening meal, particularly if the sauce is well made, is most grateful to the palate. Few English-speaking Canadians, however, can toler-

ate a large quantity of olive oil in a salad dressing, possibly because a vegetable oil is not so easy of assimilation as an animal oil. Whatever the reason for the objection may be, olive oil should be introduced into a mayonnaise in homeopathic doses. The lactucarium present in lettuce is an important ingredient, giving it an action closely resembling opium, save that it is only slightly soporific. The frequent drinking of water or other fluids in hot weather is a source of annoyance, owing to the abundant perspiration, which breaks out all over the body after taking a drink. Fruit, such as an orange, relieves thirst without causing perspiration. If fatigued by exercise, some simple food such as a sandwich or biscuit taken with a glass of water is more refreshing than a plain cold drink. Iced water is rather deluding, and really seems to increase thirst, although, when taken in the form of an iced lemonade, it is rather grateful to the palate. In places where the water supply is suspected of being polluted, tea and coffee should be taken for drink. Tea, allowed to cool, with the addition of a little sugar and a slight dash of lime juice, or a slice of lemon, is a refreshing drink in hot weather.

The sensation of feeling fit and well during hot weather is the best test of a diet. During the recent hot wave (July 1st), two Japanese gentlemen stopping at a well-shaded lakeside resort near Toronto complained of the extreme heat. In their native land during summer they could get along famously on a diet of rice, fish, eggs, tea and cakes—the menu of a leading hotel, in which roast and broiled predominated was too heavy for them, and they complained of the heat. And yet they were the countrymen of the famous Japanese infantry, which showed the way to Peking, and marched faster under a burning sun than any of the allied forces of Europe and America. Possibly genteel loafing in a strange land, want of exercise, and the lack of sympathetic conversation with young men of their own age, may have intensified the feeling of discomfort arising from hot weather.

The following menu enabled the writer to complete a very hot day with comparative satisfaction. Breakfast, at 8 a.m., consisted of Indian meal porridge and milk, tea and toast, and peaches. After four hours' work at the desk, a fulness in the head induced the use of a dessertspoonful of effervescing sulphate of magnesia, before taking luncheon. Luncheon consisted of an omelette, with beans and potatoes, milk pudding, and a cup of tea. At 2



p.m. took a trolley ride to Long Branch—about nine miles out. Felt quite light-spirited and inclined to chat to my companion. Observed that the occupants of the car, although there was a fine breeze blowing, seemed uncomfortable. Even the women did not speak much, but yawned and spoke in monosyllables. On arriving at my cottage, I removed my coat and hat, took a rake, and spent two hours raking into a heap the dead leaves of A.D. 1900. Perspired freely, but drank nothing; did not smoke at all; 6 p.m., took a sandwich and a glass of ginger ale. Arrived home at 7.20 p.m. after a glorious trolley ride. Had a small porter-house steak, some potatoes, some lettuce salad, bread and butter, and a cup of tea. Felt perfectly well. My sense of physical satisfaction seemed to depend on these factors: A small dose of sulphate of magnesia before lunch, active exercise under the shade of trees in the pure air of the country, two pleasant rides along the lake shore, avoidance of tobacco, and supper in the cool of the evening when the stomach was empty and the body was prepared by exercise for a meal.

Readers of Lord Byron's biography will recollect that the poet exhibited a preference for sulphate of magnesia, which stimulated him much as others are stimulated by champagne. Byron was probably arthritic, hence his instinctive craving for sulphate of magnesia. All men, however, are not arthritic (*Laus Deo*), and the strumous, the tubercular and the normal, when doing their best work, require different kinds of diet; but, during the heated term, men of any diathesis will be benefited by practising moderation in eating, drinking and smoking.

J. J. C.

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#### THE WINNIPEG MEETING OF THE CANADIAN MEDICAL ASSOCIATION.

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To celebrate another turning of the milestone of *The Medical Association of Canada*, we are soon to meet in conclave grave, and our meeting place is to be the Queen City of the great North-West—Winnipeg.

Winnipeg, the mushroom city that seems to have sprung up in a night, but yesterday we were wishing *bon voyage* to our college mates and friends who were going out to swell the boom-tide in Manitoba, "to grow with the place," and to build a big town over

the site of Fort Garry, and call it Winnipeg. Now, hospitably opening its gates, the physicians invite their brethren from far and near to come in and hold their meeting there, to admire the fine hospitals, asylum, educational buildings, stockyards and abattoir, residences and mercantile buildings, and note the large monetary institutions and allied interests that are now known in commercial spheres throughout the length and breadth of Canada.

It is well worth all physicians' while who contemplate "a first visit" to Winnipeg, to see a specially illustrated copy of the *Trade*



**DR. L. BROCK**

President-Elect of the Ontario Medical Council.

*Review* (Nov. 17th, 1899), published in Montreal (at Toronto a copy may be seen at the Manitoba Government Offices), and thereby obtain a glimpse of the character of the buildings that adorn the streets of the banner city of the West.

The railways have granted a single return fare to the meeting, the Secretary, Dr. F. N. G. Starr, tells us, and also a single fare rate from Winnipeg to points in Manitoba, British Columbia, and North Dakota. As a rule, the United States physician looks forward, plans forward, and arrives "sure and early" at his annual

meeting; to him it is a pleasure, a holiday, and a profitable season all in one; he gets what he goes for. After being many times present at the American Medical Association meeting, we have noticed that he contributes a great deal of the ultimate benefit he receives by his enthusiasm and *bon camaraderie*. This precedent our Canadian doctors would do well to follow, as often the attendance is not as large as it should be; for we think, without boastfulness, we may say our programme from year to year, from a scientific standpoint, is something to conjure with. In our July number we gave a list of papers to be read at the coming meeting; since then the following have been added to the list:

Tuberculosis in Milk.—Prof. Russell, University of Wisconsin.

The Present Outbreak of Small-pox in America.—H. M. Bracken, Health Officer, Minnesota.

Disposal of Tuberculous Sputum.—J. P. Elliott, Gravenhurst.

Title to be Announced.—G. Chambers, Toronto.

Chronic Ulceration of the Stomach Simulating Cancerous Disease; Relation of a Case of Gastro-enterostomy with Murphy Button, Recovery.—J. F. W. Ross, Toronto.

Report of Cases Treated with the Hot Air Bath.—W. H. Pepler, Toronto.

Title to be Announced.—J. N. Hutchison, Winnipeg.

Some Forms of Gastric Hyperacidity and their Treatment.—C. F. Martin, Montreal.

Syphilis, as Seen by the Ophthalmic Surgeon.—F. Buller, Montreal.

On the Necessity of a Better Recognition and Isolation of Trachomatous Patients in Canada.—W. Gordon M. Byers, Montreal.

Title to be Announced.—J. L. Bray, Chatham, Ont.

Epidemic Cerebro-Spinal Meningitis—A History of Some Cases.—James McKenty, Gretna, Man.

Pulmonary Tuberculosis, its Treatment and Prevention.—A. F. Proctor, Kamloops, B.C.

Mild Small-pox.—G. A. Kennedy, Macleod, Alta.

Title to be Announced.—C. J. Fagan, Victoria, B.C.

The question of Dominion Registration will come up for a full discussion.

A twofold result of the meeting at Winnipeg is looked forward to—a change of scene, an interchange of ideas—and, may we add, the expending of our loose change by prolonging our holiday, going further afield than the convention city—out to the great “Rockies,” and there seeing Mother Nature as she rises in her supreme dignity; “range after range of peaks gleaming with green and gold and garnet, over which the clouds drop purple shadows, or passing on to the west, catch and cling to some great crag, and there dissolve in rain.”

Let us all build our castles in Spain, and add all the turrets we can to them—the expanse is surely broad enough. A friend from California drifted in the other evening, and speaking of the meeting at Winnipeg, he laughingly said, “Oh, yes, that is the place they have two weeks without sleighing every summer.”

But Old Probs has given us the wink, and the wind still whispers, “Westward ho!”

W. A. Y.

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#### EDITORIAL NOTES.

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**Care of the Organ of Hearing.**—Grown-up people, says Dr. Lermoyez, of Paris, in *La Presse Medicale*; ought to be resigned to notice the ear gradually fail, like the other senses. However, this failure of the organ of hearing should be neither precocious nor precipitate. It is, also, prudent to have one's hearing verified by an expert, inasmuch as an individual makes serious mistakes in judging his own sharpness of hearing, by holding a watch at arm's length. In certain professions, testing the hearing is absolutely necessary. Railway trainmen ought to have their hearing examined at least once a year. On account of their business, which exposes them to gusts of wind, as well as piercing whistles, they are liable to become deaf. It is not at all rare for them to be affected without their knowledge, with a kind of auricular Daltonism (Moss), which deprives them of the faculty of hearing sharp noises, that is to say, the very signals which they ought to hear best of all. Singers should also have their hearing periodically examined. Some fine day a singer shows that he has lost the correct appreciation of tone, or sings in a full tone when he should sing in semi-tones, for no other reason except that his failing organ of hearing improperly regulates the sound he wishes to produce.

**Is a Buzzard a Bacterium.**—In reference to some remarks about osteopathy which appeared in our June number, Dr. Ashmead, of New York, sends us a pleasant letter, published in our July number, indicating that in describing the buzzard as “not remarkable for sense,” our view differs from his observations made in Japan. In that country, he says that the buzzards regularly remove and consume domestic garbage. In the note in our June number it was stated that a bacterium is a micro-organism, and not a buzzard, as the writer on osteopathy we quoted says it is. It is not necessary to ask Dr. Ashmead to acknowledge the truth of our assertion. He will, no doubt, also agree with us that osteopaths claiming to practise a science, should not be exempted from examination as to their knowledge of its principles. “They should also possess a knowledge of drugs, if for no other purpose than to be able to recognize the symptoms of poisoning; for it stands to reason, that patients would send for them to treat them, unconscious of the fact that they knew nothing of the drug symptoms” (*Medical Visitor*). Dr. Ashmead will, probably, also admit that, if the buzzards who, without being “remarkable for sense,” yet undertake to advise the public in medical matters, were to abandon America for Japan, educated physicians would not shed many tears.

**Late Notice of Bioxide of Sodium by Pharmaceutical Journals.**

—In glancing through some pharmaceutical journals, we noticed in *The Spatula*, of New York, May, 1901, an article on bioxide of sodium, entitled “A New Air Purifier.” This article is also published in *The Montreal Pharmaceutical Journal* for June, 1901. We have no objection to find with the article in question, except that the writer is rather behind the times in stating that “Drs. Desgrez and Balthazard have recently made the important discovery that bioxide of sodium will purify and repurify air indefinitely.” In August, 1899, an article appeared in this journal describing the chemistry of the discovery made by the French physicians, and concluding as follows: “This discovery may be utilized in submarine work, principally in the submersible ships which are so much spoken of now-a-days. In order to maintain the balance of the confined air and the normal air pressure, it would be absolutely necessary to provide a second service of oxygen—say, for instance, a few tubes of liquid oxygen—for the bioxide of sodium absorbs proportionately more carbon dioxide

than it exhales oxygen, and in one case the experimenters observed that the pressure fell a fifth of one atmosphere as a result of this difference in oxygen."

**Dr. Kitchen, of St. George, Entertains the Ontario Board of Health.**—The members of the Provincial Board of Health of Ontario were entertained by Dr. and Mrs. Kitchen, of St. George, Ont., on the 24th and 25th of June last in a style which it would be difficult to surpass. Met at the station by their host, they had an opportunity of admiring, behind a team of "blood horses," a handsome countryside and a neat village, which looked their best on a warm June afternoon. The dinner, which was served at Dr. Kitchen's mansion, was a very pleasing function, and was most gracefully presided over by the hostess. Drs. Patten, Barber, and McWillie, of St. George, dined with the members of the Board. After a post-prandial chat on the lawn, a meeting of the Provincial Board of Health was held in Dr. Kitchen's library. A pleasant night's rest, devoid of the noises of the city, breakfast, and a glorious drive to Harrisburg, terminated a visit not soon to be forgotten.

**Diet for Tubercular Patients.**—A well-regulated and nutritious diet is indispensable in European sanatoria for tubercular patients. The following diet for an afebrile tubercular patient is worthy of note:

8 a.m.—Bread, butter, honey, cocoa, coffee or chocolate, with two or three glasses of milk.

10 a.m.—Bread, butter, cold meats, etc.

1 p.m.—Soup, fish, meat, salad, vegetables, preserves, dessert and fresh fruit, with one or two glasses of wine.

4 p.m.—Glass of milk, with bread and butter.

7 p.m.—Thick soup, meat, rice, bread and butter, salad, cooked fruit, and again one or two glasses of wine.

9 p.m.—Glass of milk, with two or three teaspoonfuls of cognac.

People of normal body temperature who would partake of such a menu, would not be likely to find their way to a sanatorium of any kind, unless they happened to develop gout.

**Thermometric Indications of Predisposition to Disease.**—Dr. Tatau (of Nantes) in a paper read before the Therapeutic Society of Paris, contended that the temperature of the body bears direct relation to certain tendencies to disease in individuals. He

divides people in ordinary health into three distinct categories, measured by the temperature of their bodies. In one of these groups (the normal) the temperature of the body ranges from 98 3-5 to 99.5 Fahr. In a second group the regular temperature is 100 2-5; people with the latter body temperature have a tendency to tuberculosis, and as a matter of fact they do contract tuberculosis in the sequel. Certain other individuals, the gouty and the scrofulous, have a temperature below 98 3-5 Fahr.

**To Get Rid of the Mosquitoes in Inhabited Places.**—Opinions differ as to the best means of getting rid of the mosquitoes in inhabited places. Dr. Onimus recommends the vaporization of oil of cajeput in the room which is to be cleared of the pests, but he thinks that a strong current of air, such as may be generated by an electric fan, is more effective. Dr. Michon favors the causing of a thick smoke, before sunset, in the room which is to be freed of mosquitoes, taking care to leave the windows open. The insects are driven out and, after the smoke has escaped from the room, the windows are closed. Dr. Laveran pins his faith to a good mosquito net.

**Meeting of the Executive Health Officers of Ontario.**—The Sixteenth Annual Meeting of this Association was held at Brantford, on the 25th and 26th of June. The Mayor of Brantford, Mr. Wood, the Chairman of the Local Board of Health, Mr. Bowlby, and the members of the civic committee assisted in making the meeting a success. Many of the papers read were of a high class, and the subsequent discussions useful and instructive. The Association has reason to feel satisfied with the progress it has made. With increased instruction in hygiene in the schools, the rising generation of Canadians will evince a keen interest in sanitation.

**Dr. Senn's Race Against the Sun.**—Dr. Nicholas Senn will devote his summer vacation to a ninety-days' trip around the world. He will travel in an easterly direction, and the journey has been christened by him as "a race against the sun." The same phrase will form the title of a book, in which form letters to the *Chicago Tribune* will appear later. He will be accompanied by Dr. Daniel R. Brower, his colleague at Rush Medical College, and two other professional acquaintances.—*Med. News.*

# The Physician's Library.

## BOOK REVIEWS.

*Progressive Medicine.* A quarterly digest of advances, discoveries, and improvements in the medical and surgical sciences. Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. LANDIS, M.D., assistant physician to the out-patient medical department of the Jefferson Medical College Hospital. Vol. II.; June, 1901. Surgery of the abdomen, including hernia; Gynecology; Diseases of the Blood; Diseases of the Glandular and Lymphatic Systems; Metabolic Diseases; Ophthalmology. Philadelphia and New York: Lea Brothers & Co. 1901.

Among the contributors to Vol. II. of *Progressive Medicine* for 1901, we find the name of our confrere, Dr. Alexander B. Blackader, of Montreal. Some of the other writers in the volume are Drs. W. B. Coley, J. Chalmers Da Costa, Wm. Ewart, H. B. Baker, Alf. Stengel, and A. L. Turner.

We have seldom had the pleasure of reading a more thorough and exhaustive treatise on the Radical Cure of Inguinal Hernia than that by Dr. Wm. B. Coley in this volume, covering over fifty pages. It is entirely up to date, is written in a most lucid manner, rendering its perusal enjoyable and instructive reading, instead of being, as too many a treatise upon this subject is, a dry and decidedly knotty study. The section is beautifully illustrated in half-tone. Two other chapters which attracted our attention as being thoroughly practical were by Dr. J. G. Clark, the one on "The Disinfection of the Hands," and "The Diagnostic Value of Pain in Gynecology." Vol. II. of *Progressive Medicine* is fully up to the standard of previous editions.

W. A. Y.

*Text-Book of Physiology.* Edited by E. A. SCHAFER, LL.D., F.R.S., Todrell Professor of Physiology, University College, London. Two volumes. Edinburgh and London: Young J. Pentland. New York: The Macmillan Co., 1898. Toronto: Tyrell & Co.

There is little doubt that there has, for years now, been felt the want of a good text-book, in the English language, on the very important subject of physiology. There are some good manuals on the subject to be got; but as animal physiology forms the basis of



everything else, and a correct, in fact, a minute, knowledge of it is absolutely essential before one can properly study pathology, or anything still further advanced, the necessity of a text-book or system of physiology will at once be recognized. Dr. Schafer's reputation in matters physiological is well known, and the mere fact of his name appearing as editor to this work, will alone be more than sufficient to sell it. The book is in two large volumes; each is filled from cover to cover with matter well and succinctly written, the topography being exceedingly distinct and attractive to the reader. Volume I. deals with the chemical constitution and chemical processes of the animal body, and those phenomena connected with the production and elaboration of the secretions and fluids of the body. In the second volume, circulation and respiration, the physiology of muscle and nerve, the special senses, and the functions of the central nervous system, are dealt with in detail. We perused with great interest the section devoted to circulation and respiration, those subjects being treated in a clear, comprehensible manner, and makes a couple of hundred pages worthy of study by even the most advanced student. The text-book is the right size, not too bulky; but contains information which all students and practitioners of medicine should make the basis of their life-work. We bespeak for Dr. Schafer's Text-Book an unusually large sale.

*A Syllabus of New Remedies and Therapeutic Measures; with Chemistry, Physical Appearance and Therapeutic Application.* By J. W. WAINWRIGHT, M.D., Member of the American Medical Association, New York State Medical Association, United States Pharmacopeial Convention, 1900; American Chemical Society, etc. Pages, 229. Price, \$1.00 net. G. P. Englehard & Co., 358-362 Dearborn St., Chicago, 1901.

This monograph reveals to the reader all that is strictly new in the science of medicine and therapeutics. In it he will find most of the very latest remedies that have passed the experimental stage and have become absolutely essential to the physician who intends keeping up with the age. Special mention might be made of the articles on anesthesia, local and regional, including spinal cocainization, the animal remedial preparations, and serum therapy. The application of heat and cold, with a description of the hot air treatment which is meeting with remarkable results in acute and chronic rheumatism, traumatic synovitis, sprains, arthritis deformans and other joint affections; the treatment of Nauheim and Schott in all sorts of cardiac insufficiencies; and finally, a description of the many uses of the Roentgen Ray—these all help to make a very complete volume, and should save the busy doctor or student much unnecessary time spent in searching the

many journals and works for clinical reports on these subjects. The publishers' work is of the most finished and approved style.

W. H. P.

*Sajous' Annual and Analytical Cyclopaedia of Practical Medicine.*

Volume VI. Rectum and Anus, Diseases of; to Zinc. General Index. Philadelphia: The F. A. Davis Co.

We are indebted to the publishers for the last volume of this admirable series. As the editor says, "the complete work presents all the general diseases usually described in text-books, and besides, what progressive features the past decade has furnished." Truly a great claim, necessitating the exclusion of much that seemed admirable at one time, but which the relentless hand of progress has relegated to disuse; and also bringing into notice new surgical procedures and novel therapeutical agents which have replaced operations of less precision, and remedies of less efficacy, than those with which some of us were familiar.

The general index at the end of the sixth volume enables the reader to readily find any article in the cyclopaedia he wants. Of necessity such a medical cyclopaedia is of the first importance, placing the ordinary physician, who is willing to read carefully, in the position occupied by a man who reads and digests the standard medical literature of the day. Changes, of course, will occur, and new writers will have to take up the pens of those who have fallen by the way; but, in many subjects, for a decade or more, little change will occur, and to keep track of subjects about which opinion is shifting, it will be necessary to read reputable medical journals.

J. J. C.

*Uterine Fibromyomata: Their Pathology, Diagnosis and Treatment.* By E. STANMORE BISHOP, F.R.C.S.Eng., President Manchester Clinical Society; Fellow of British Gynecological Society; Honorary Surgeon Ancoats Hospital, Manchester, etc. With 49 illustrations. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1901. Canadian Agents, Chandler & Massey Limited, Toronto, Ont. Price, \$3.50.

The subject of uterine fibromata, or as the author prefers, fibromyomata, is one of great interest to medical practitioners. Those who are not doing abdominal surgery require a knowledge of the diagnosis, prognosis, and condition of patients after the various methods of operation, while those engaged in abdominal work require, in addition, a knowledge of the technique and methods of other surgeons. This work of 323 pages, including index, is designed to fill the wants of both classes.

After a review of the anatomy of the parts, symptomatology, diagnosis, development, and secondary changes in the tumors are taken up. Treatment is considered under the heads of medical, electrical, and surgical. The methods and technique, together

with the post-operative results of a great number of operators, are given in as clear and concise a form as possible. This latter is a very valuable feature of the work.

The illustrations are clear and the paper and type good. Altogether, we can recommend this work to our friends. W. J. W.

*Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis.* By PROF. DR. O. HAAB, Director of the Eye Clinic in Zurich. From the third revised and enlarged German edition. Edited by GEO. E. DE SCHWEINITZ, Professor of Ophthalmology Jefferson Medical College, Philadelphia. With 152 colored lithographic illustrations and 85 pages of text. Philadelphia and London: W. B. Saunders & Co., 1901. Toronto: J. A. Carveth & Co. Price, \$3.00 net.

An atlas can never supply the place of actual clinical instruction—plates of ophthalmoscopic appearances, however well executed, give but an idea of the real, yet to the beginner, or to the practitioner who has not access to an abundance of clinical material, they may prove useful. In obscure or rare cases an atlas may serve as a standard of comparison.

In this work the lithographs of the fundus changes are very well done. In addition there are many plates of the microscopic lesions, as well as some 80 pages on the use of the ophthalmoscope. If the value of a medical book may be judged by the number of its editions, then is Haab's Atlas indeed valuable, for it has run through four English editions in five years. J. M. M.

*A System of Physiologic Therapeutics.* A Practical Exposition of the Methods, other than Drug-Giving, Useful in the Treatment of the Sick. Edited by SOLOMON SOLIS COHEN, A.M., M.D., Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College, etc. Volume II., *Electrotherapy*, by GEORGE W. JACOBY, M.D., Consulting Neurologist to the German Hospital, New York City; to the Infirmary for Women and Children, etc. In two books: Book II., Diagnosis; Therapeutics. Illustrated. Published by P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, Pa. Price, eleven volumes, \$22.00 net. Canadian Agents: Chandler & Massey, Limited, Toronto and Montreal.

In this volume, our friends the specialists will find much material of value to them, as in it are several chapters upon the uses of electricity in surgery and the specialties. We are glad of one thing, viz., that each chapter is complete in itself, so that it is not necessary for the reader, in studying any particular subject, to have to wander from one part of the volume to the other in order to complete his work. This is a most commendable feature of Dr.

Cohen's system. This book is divided into Parts III., IV., and V.: Electrophysiology and Electropathology; Electrodiagnosis, and Electropagnosis; and Electrotherapeutics. To the general practitioner the last section will prove most interesting, taking up, as it does, the more practical side of the subject. The pages devoted to the electric treatment in diseases of the motor nerves and muscles, diseases of the muscles and joints, diseases of the sensory nerves, and diseases of the central nervous system, are very interesting indeed, and well worthy of careful study. To any one desiring an accurate knowledge of electrotherapeutics, we say, buy these two books.

*The Crisis.* By WINSTON CHURCHILL. Toronto: Copp Clark & Co., Limited. Cloth.

The world and his wife has read "Richard Carvel," and thoroughly enjoyed it. Even the author seems to have so loved his characters that he was loath to let the book close over, and so he still perpetuates their memory by devoting the pages of "The Crisis" to the lives and times of their descendants. Many characters live to speak in this tale of troublous times in the grand old South, but the author, with wondrous skill, gives to each an interest, and the reader finds himself never perplexed by this wealth of personalities; but on the contrary, the story would seem incomplete were even one omitted.

Mr. Churchill has been accused of hero-worship, a good fault when a hero so worthy of the worship is honored in the person of Abraham Lincoln. May we quote a word or two of the author's graceful tribute: "The 'Lincoln of the black loam,' who built his neighbor's cabin and hoed his neighbor's corn, who had been store-keeper, and postman, and flat-boat man . . . the physician who was one day to tend the sick-bed of the nation in her agony; whose large hand was to be on her feeble pulse, and whose knowledge, almost divine, was to perform the miracle of her healing." Do not omit "The Crisis" from the summer's holiday list of books to be read; it is certainly more than "worth while." A little of joy, something of sorrow, and a very great privilege and an absorbing interest to the reader.

W. A. Y.

*Golden Rules of Aural and Nasal Practice.* By P. R. W. DE SANTI, F.R.C.S., Aural Surgeon to Westminster Hospital. "Golden Rules" series No. IX. Bristol: John Wright & Co. 1s.

This little book of waistcoat-pocket size, in its 84 pages, seeks to emphasize the essential points with a view to practical utility. The author has certainly done wonders in the limited space given him, and both student and busy practitioner will find the "Golden Rules" valuable as a refresher of memory.

J. M. M.