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CANADA

MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

Gastrotomy for the removal of Ovarian and other Tumors from the Abdominal Cavity. By ROBERT NELSON, M.D., New York.

The operation of gastrotomy may be needed for several purposes; but principally for the removal of tumors situated within the peritoneal cavity. There are three kinds of tumor that particularly call for gastrotomy; and which, without this operation, end always in death: 1st. Ovarian tumors. 2nd. Fibrous out-growths from the uterus. 3rd. A fibro-adipose mass that may have its origin and seat between the layers of the broad ligament, or in the parenchyma of the ovary; or in the annexes of these organs.

The *ovarian tumor* most frequently met with is the *mutilocular* variety, commonly called ovarian dropsy. It occurs between the ages of eighteen and twenty-five years, and thirty to sixty years; that is, about the periods of nubility and its cessation. It consists of a general hypertrophy of all the tissues that constitute the ovary—its internal structure, its capsule or external coat, and the peritoneum that covers it. All these enlarge, not by stretching, but by growth. Within, it is made up of numerous cysts that vary in size from that of a currant to an orange, and some of them even to a sac capable of containing ten to fifteen pints of fluid. The smallest of these cysts are the newest, and are filled with a glutinous transparent fluid; but that which is contained in the larger and older cysts is thick, ropy, opaque, and colored from light bluish to dark brown. Each cyst is lined with its own proper membrane, of a quasi mucous character, and they are separated from one another by intervening septa of cellular tissue, which tissue gives passage to the long slender and delicate vessels that supply the cysts. They are said to be graafian vesicles. They adhere to one another, and to the outward envelope when next to

it. The whole mass is of rapid growth, enlarging the abdomen in the space of a year or so, to the size of a full pregnancy; and when, after repeated tapping and refilling, the parieties of the abdomen yielding with more and more ease to the distention from within, the tumor may attain to a size weighing seventy pounds. The largest cysts lie in front, and by paracentesis will discharge from a few to fifteen or twenty pints of fluid. This operation gives all the other cysts an opportunity to increase, and to the lately emptied one to refill. When the tapped cyst is quite emptied, the trocar is compressed by the adjoining cyst out of the line of entry, and made to lie against the front of the abdomen. Some operators have taken advantage of this to thrust the instrument into a second cyst; but not without danger, for an intermediate vessel has been before now wounded, and has bled internally into the sac, even to filling it, resulting in the death of the patient; for the patient is generally much reduced at this time, and her volume of blood greatly diminished. Such an error would be avoided by a practitioner acquainted with the structure of an ovarian dropsy, and the distribution of the vessels that run into the septa. Another error, one that has run the rounds of the journals, would not have been committed and cruelly repeated—that of emptying *one* cyst and injecting it with that universal panacea—iodine—had the operator reflected for a moment that he had treated only *one* cyst, while he left *one* hundred untouched; to say nothing of the stupidity of supposing that an analogy existed between hydrocele, and the cysts in an ovarian dropsy—the first a disease in a serous membrane and a single cavity, attackable in its whole extent, and capable of throwing out adhesive matter subject to organization; while the second consists of a multitude of separate and uncommunicating cysts, each lined with a *quasi mucous* membrane, incapable of throwing out plastic (fibrinous) matter, and becoming organized into an adhesion that should unite the parieties of the sac, and so obliterate the cavity.

The growth of an ovarian tumor is rapid, but unaccompanied with pain, excepting that which is due to distention of the parieties of the abdomen. There is also distress, when large, from its encroachment into the thorax, pushing the diaphragm as high as the fifth, or even the fourth rib, producing dyspnœa; also by the pressure on the stomach, leaving to that viscus little capacity for the reception of food. In a few cases it will cause a partial ascites by its pressure on the large visceral veins and on the kidneys. When the tumor has attained to a large size, the length of the linea alba from the pubis to the ensiform cartilage has reached the extent of twenty-eight inches in two of my cases.

Fibrous out-growths from the uterus into the peritoneal cavity gene-

rally proceed from the superior part of the uterus; sometimes from the front, or back, or any other part of it, and is immediately covered by peritoneum, hence called *superitoneal*. A portion of the tumor is contained within the walls of the organ, the two commingling by degrees that render it difficult to say where one structure ceases and the other begins. When the tumor is largely developed between it and its peritoneum, numerous broad veins are seen on the surface, leading inexperienced spectators of an operation to exclaim, "what large *varicose* veins." These veins are not in a varicose state, not having their parieties thickened or hypertrophied; but are only expanded laterally; they are nearly flat, and their parieties are thin like ordinary veins, and being flat contain little blood, since, like all flattened tubes, their area is much less than those which are cylindrical, a form of the greatest capacity. The arteries that lead into the tumor are few in number; but, within the new structure, they become numerous, though of small calibre; yet, their united areas much exceed that of the afferent vessels. Hence it is that fibrous tumors that ulcerate within the womb, or are wounded, pour out blood abundantly, because their vessels are, to some extent, held patent by the inelastic fibrous body in which they course, and in this way draw upon the afferent vessels, more than these furnish when the tumor is in its integrity, and its vessels simply filled. The structure of the tumor is distinctly homogenous and fibrous throughout, as seen in a very large one that I extirpated (and in many others), composed of inextricable fibres, yellowish, dense, resembling boiled cow's udder, capable of being cut into slices without collapsing. This kind of tumor progresses very slowly; taking ten or more years to reach the size of a man's head; but, at last, takes on activity, and then grows rapidly, to the sure destruction of the patient, if it be not extirpated. While slowly increasing in size during many years, it does not disturb the health or even the comfort of the patient, giving no pain until of large size, and then only such as is due to unequally distributed distention of the abdominal parieties, more so when its shape is irregular, or its surface is bosselated by outgrowths from its own surface.

As long as the case is not troublesome to the patient, and its growth is slow, it had better not be meddled with; for such cases can go on for many years, and possibly the patient die from some intercurrent malady or accident in the interim, before the tumor shall put on activity and become dangerous. Besides, the longer a patient endures a disease curable by surgical means, the less is the danger that follows an operation. And the more the abdomen becomes stretched, within bearable limits, the more safely it may be cut into with less apprehension of subsequent

inflammation; hence it is, that success is more likely to follow an operation for a large than a small tumor, to follow a protracted than a recent case.

In illustration of these statements regarding fibrous outgrowths, I now give two cases out of several. A discreet and virtuous woman, but of a salacious temperament, married at about twenty, and became a widow two years after, without having been impregnated, although, according to her statement, her connubial state had been quite satisfactory to her. Previously to her widowhood she felt an uneasiness or weight in the pelvis. As this increased she perceived that something was enlarging within her. She consulted many practitioners, when, at last, a tumor in the hypogastrium became palpable. This was diagnosed, at the time, as ovarian. Iodine internally and externally, leeches on the abdomen, and emetic-tarter pustules kept cropping out for several months, leaving their indelible marks on the surface of the abdomen, was the treatment pursued unavailingly. At last the tumor presented a bi-lateral or double appearance, the larger one filling one iliac region, and the lesser one occupying the opposite region; between the two, under the linea alba, there was a distinct hiatus. She was now told that she had enlargement of both ovaries; various medicines were persevered in unavailingly; and she at last gave up "doctoring." All this time she enjoyed perfect health excepting the disturbance produced by futile medication. Her appearance was attractive, and her sexual desires great, which led to a second marriage, after she had honestly made her case known to her suitor. She married. All went on as usual for two years, when, without perceptible cause, the "two" tumors began rapidly to increase in size. I now saw her for the first time, and got from her the foregoing history. On examination, not finding fluctuation or elasticity, conditions that belong to ovarian dropsy, and thinking of the slow progress of the case, I told her and her husband that there was no disturbance in the ovaries (her catamenia regular, and the sexual appetite as generous as heretofore); but that the resisting nature, and the hardness of the "two" tumors was different from what happened in ovarian tumors.

They requested an operation, which I hesitated to undertake, but at last consented to do it. She went home, a distance of a hundred miles, to settle household affairs, and returned in eight days. In this short period, so rapid had been the increase, that the tumor reached half way between the umbilicus and scrobiculus, and she had become lean and looked much exhausted. A long incision, from the pubis to near the pit of the stomach, was made, exposing the tumor, which was a single one, with two outgrowths from its surface, the whole springing from the greatly

enlarged base of the uterus. It was cut off and removed, she made a good recovery in four weeks and continued well after. The tumor was covered under the peritoneum with broad meandering veins. The arteries that entered the pedicle were small where it was divided, and easily secured. The tumor itself was a solid homogeneous mass, hard and resisting, and divisible into large yellowish slices, showing very few sections of vessels.

The second case is that of a married lady, the mother of two children, the youngest approaching puberty. A year or two after her last confinement she thought there was something unusual going on in the pelvis. In the course of a few years, a round, hard tumor gradually ascended into the hypogastrium, which continued to grow very slowly when I saw her, about ten or twelve years after its commencement. She suffered no pain or other inconvenience from it. I therefore advised her to do nothing. I heard of her a few years after, and she was in her usual health.

A third case I may as well mention. A married woman who had borne children, presented an abdomen as large as a pregnant one. She had had it some years. I saw her about a month before she died, in considerable suffering, but without fever of any kind. It grew from a much enlarged uterus, as seen on dissection, was solid throughout, and resembled the one first described.

The Fibro-Adipose Tumor is composed of large fatty masses separated from each other by tenacious cellular tissues and fibrous bands, but no where distinctly separate. These masses vary in size, from that of a fist to a fœtal head. The whole are enclosed in a fibrous envelope, and the peritoneum is spread in front above and over all. One that was removed by operation weighed thirty pounds, and another forty. They seem to be generated within the broad ligaments, at least this was the case in both instances just now mentioned. Hypertrophied fibres of these ligaments, much lengthened and more or less separated from each other, enveloped the mass all round and sent bands into the new structure, growing with the tumor. The peritoneum expands before it, behind and all round, excepting where it has its attachment, which is very extensive, like a mesocolon, to the last lumbar vertebræ, promontory and hollow of the sacrum. In the few cases I have seen it had extensive adhesions to the whole front of the abdominal parietes—some few to a loop or two of intestine. Through the parieties of the abdomen the tumor gives a softer or more yielding feeling than does the fibrous outgrowth from the uterus; and, on palpation there may be felt a deceptive sense of fluctuation, which is due to the quality of the fat, of a very soft nature, in them, it being much less dense than that which is met with in lipomas

under the common integuments. This apparent fluctuation I have known to deceive a surgeon. These tumors and their lobes are supplied with few but not large arteries; and, abundantly with expanded veins, some of them resembling sinuses. These fatty tumors are less rapid in growth than are the ovarian, but more so than the purely fibrous outgrowths from the uterus.

There are other abdominal tumors occasionally met with that might possibly be relieved in some cases by an operation; but the three kinds I have mentioned are those that specially call for gastrotomy, which may be undertaken with hope of success, and which are sure to end in death if not removed.

ADHESIONS.

All these tumors, when of long standing and grown large, are liable to become adherent to the anterior parieties of the abdomen, sometimes even to the liver, which they crowd up, to the diaphragm, or to the spleen, or to some portion of the omentum; but this last, in most cases of very large tumors has become more or less absorbed by the pressure they make against it. Posteriorly there are few, if any adhesions, which absence is due to the almost ceaseless peristaltic movement of the intestines, and their alternate distention and collapse, affording no time for union to become effected.

These adhesions are not due to inflammation, effusion of lymph and its subsequent organization; for, in all the cases I have observed, excepting one, the patient has at no time suffered from any—the slightest—symptom of fever, or from that peritoneal pain that invariably accompanies inflammation. The adhesion is due, simply to great pressure of the tumor against the tensely stretched abdomen. In the early stages this tightness does not exist, and the lesser size of the tumor admits of its sliding to some extent during the movements of the patient while getting up, lying down or walking. On the contrary, when the tumor has attained a great size, its anterior surface presses forcibly, and *constantly* against the front of the abdomen, causing the epithelii of the two surfaces to disappear, and by the same cause—its great size—is held steadily in one place, immovable. The two peritonei having come into *immediate* contact, coalesce into a single membrane apparently, in those places where the pressure is greatest, constant and fixed; but in other parts less pressed the two membranes adhere less intimately, and can be easily separated by the fingers of the surgeon pressing between them, without giving escape to so much as a tinge of blood, because here no vessels exist.

Having heard that adhesion of separate parts cannot take place with-

out the intervention of inflammation, and its office of throwing out fibrous matter to become organized between adjacent surfaces and thus effecting union between them denied, I may as well give one or two examples, out of many, to prove that an intimate union of naturally separated parts can take place without the intervention of the famous *adhesive inflammation.*

CASE.—A child affected with intervertebral softening, ends with distortion of the spinal column which draws the ribs with it. The arches of the ribs on the convex side of the curvature become widely separated from each other; while the arches of the ribs on the lesser curvature are approximated. The intervening intercostal muscles was by pressure which arrests nutrition and permits the absorption of the effete material to go on, and when the upper and lower edge of the adjoining ribs approach nearer and nearer, until at last the peritoneum of each has ceased to exist, the two ribs *touch*, unite, and in that place form a single, broad and flat rib. All this goes on without the slightest complaint of pain or inflammation, because it is a natural process. It is common enough to get such a skeleton if sought for; and many are to be seen in museums, where not only two but three ribs are united into a single one on the concave side of a distorted trunk.

Another example may be mentioned: A man had his foot badly crushed; it swelled enormously under the treatment, and sinuses formed in the course of some of the thecæ of the tendons. When consulted at a late period, I advised his surgeon to put a thick compress above and below the phalanges with a roller over all, with a view of diminishing the swelling by the absorbent effect of pressure, and to keep all wet with water. This was persevered in too long; the epidermis between the second and third toes was washed away, gradually admitting the reta mucosa of each to come into immediate proximity. When I saw the case subsequently the two toes were united, as regards the soft parts, into one. All this occurred in the complete absence of inflammation, and the effusion of fibrin to become organized subsequently. In this way toes have united, little by little from simple entertigo, they being maintained in contact by pressure. In the case of burns it is different, for here fibrin in a thick coat is quickly thrown out, and if not peeled off will surely organize, and in the subsequent stage, long after having healed, the fibrin becoming absorbed, irremediable contractions gradually follow.

Tumors do not become adherent to the parieties of the abdomen, or viscera, as long as they are small or of recent growth; because they exert no great pressure on the opposite parts and are so mobile as not to stay long enough in contact with one point to become connected.

CASE.—A girl about twenty years of age had ovarian dropsy, which, from the first perception of it to when I removed it, lasted eighteen months. It was non-adherent although nearly thirty pounds in weight. Other patients with similar tumors of about the same size and standing, were without adhesions. A fibroid outgrowth from the uterus of ten years' standing, had reached only a little above the umbilicus, when it suddenly took on rapid growth, and in two or three months after, when I removed it, it was unadherent, although it now filled both iliac regions and reached half way up between the umbilicus and scrobiculus; but then for a long time it was small, and when grown large at last had done so in a period too short to have contracted union by pressure to adjacent parts. It is quite different in large tumors of long standing. A girl twenty-nine years of age had a very large ovarian tumor of over two years, standing. It was adherent to the whole front of the abdomen and sides, to the anterior third of the diaphragm, to a portion of the spleen, and to a part of the liver, but no where to the intestines. After removal it weighed fifty-five pounds. The anterior adhesions were easily severed by the hand and outspread fingers, while in other places the adhesions tore into tough ribbons, and a few had to be cut through. No blood escaped. She quickly recovered notwithstanding the great extent of the adhesions severed. No peritoneal inflammation or fever followed, doubtless because no true peritoneum remained at the seat of adhesions. In several other cases of large and long standing tumors adhesions existed, which must be expected. They will be found strong, according to the length of time they have existed, requiring considerable force to tear through them. In all these cases there need be little fear of hemorrhage as a consequence of their severance.

Before treating of the operation it may be well to examine the subject of inflammation; this is the ghost that haunts many surgeons before and after an operation—especially so when its seat is a serous membrane—bewilders and obfuscates the judgment, induces preparatory measures that always add to the disorder, and after an operation is so prolific through fear of it, of numerous injurious medications to the risk of the patient.

INFLAMMATION.

Many practitioners regard wounds of the peritoneum as peculiarly dangerous from the inflammation that is apt to follow. Hence has arisen the dread of performing operations within the abdominal enclosure. This fear has so greatly influenced the judgment and practice of some surgeons that they decided, in cases of hernia, to divide the stricture without cutting into the sac, and, in this way avoid wounding the peritoneum, and not

expose it to the much dreaded malignancy of the atmosphere. We have all seen the direful consequences of this innovation, founded on the mistaken notion of regarding all peritoneal inflammation as *of one* kind only, while there are at least *two*, differing from each other in cause and course, each of which is subject to different phases and terminations; which I shall now examine, and endeavour to show that one kind, idiopathic in certain seasons, and countries, is really a fearful disease; and the other —that which is likely to follow gastrotomy is less to be feared than the first. Although what follows is not mentioned in books or in lectures, let it be borne in mind as an axiom, that any inflammation is merely an *accident* to many diseases which differ widely from each other; that it is never the cause of the malady; but is always the effect of a disturbance elsewhere situated—near by, or far off, and sometimes is of so prominent a character as to be taken by some practitioners as being itself the whole disease, and the only thing to be combatted.

1*st*.—IDIOPATHIC INFLAMMATION.

A remarkable example of the erroneous opinion entertained regarding inflammation, among a thousand others that arose and lived a day, was that of the celebrated Broussais and his disciples, a doctrine that overshadowed all "Young Europe" for a few years, and filled so many untimely graves. He and they denied the possibility of Idiopathic or Essential fever, as the schools call it, on the ground that they always found in every fever some one or other organ inflamed—true, so far; and asserted that the inflammation seen was the cause of the fever. They disregarded the fact that the fever in *every* case had existed several days before the local disorder—inflammation—became manifest; passed over the patent fact that, in the same fever, during the same epidemic, patients in the same house, at the same time, might have the local disorder—inflammation—(as in typhus) situated in a different organ in one patient, it might be muco-gastritis, in another an enteritis, in a third a bronchitis, in another an arachnitis, while the fever—typhus—was the same in all.

In variola, the fever (which is the real disease) exists with violence three whole days before the irruption; six before the commencement of areolar inflammation. In *idiopathic* erysipelas the fever precedes the local disorder at least twenty-four hours;—and so on, for every *essential* fever or disorder.

Idiopathic peritonitis and enteritis are always preceded by fever, more or less marked: but, the inflammation once become manifest, like in the irruption in variola, and other exanthemata, the inflammation is the most notable condition of the patient. The idiopathic peritonitis is a specific

disease, due to a general cause; it rapidly spreads, in high latitudes, over the whole peritoneum—parietal and visceral,—throwing out a thick layer of fibrin, and, there, too often ends in death in a few days; so also, in puerperal peritonitis; but here, the effusion is less fibrous or solid than in pure peritonitis. These inflammations are due to occult cause hidden in the system. The physician claims the attendance on these cases as peculiarly belonging to his branch of what may be truly called the *black art* of the profession—conjecture bedaubed with speculative imaginings; claiming that the physician alone is competent to prescribe, holding the knowledge of the surgeon in contempt as compared with his conceit.

2*nd*.—TRAUMATIC INFLAMMATION,

As the name implies, is always due to mechanical injury, and varies in severity according to the nature of the lesion—bruising, tearing, or simple clean cutting. It is a very different affair from idiopathic inflammation, which has a prescribed course to run, and which is merely the expression of a disease in the whole system. The traumatic is merely the sequel of a local injury. It rarely becomes manifest before twenty-four hours after the accident; and in four or five days produces pus, a natural crisis, the generation of which mitigates all the inflammatory symptoms, unless the lesion have some poison, morbid or chemical, added to it, in which case it may increase even after the generation of pus, and progress indefinitely. But in a healthy person, should the lesion consist of a clean cut, and the edges be brought nicely together, union will take place without the intervention of inflammation, even of that slight degree erroneously called "adhesive." This result I have seen in several cases of gastrotomy.

There is a difference in the amount of inflammation that follows wounds in different parts of the body, or when the patient is unhealthy at the time of being wounded. A cut into the abdominal cavity of persons that have had it previously much distended, as by pregnancy, by large ovarian or other large tumors, is followed by much less inflammation than in those who have not so suffered. Every surgeon of only a few years' practice has noticed that small cuts, like that of a penknife into the abdomen of a man, or of a female who has never been stretched, is a rather serious affair; while a similar stab into a previously distended abdomen, by even a worse instrument—a trocar—is seldom followed by peritoneal inflammation.

In the case of gastrotomy for the removal of tumors, the cause of this is very simple and of easy explanation. In the slowly and long stretched abdomen, all the parts that conspire to form its lateral and anterior

boundaries have been gradually expanded in both latitude and longitude, but not in thickness, the parts did not *grow*, as the pregnant uterus. The vessels elongate, but scarcely enlarge, they rather diminish in calibre, for instance, the epigastric artery which, in the natural state, reaches from Poupart's ligament to the upper section of the rectus, there to anastomose, with branches of the substernal—and lower intercostals, is scarcely nine inches long, while on the largely distended abdomen from pregnancy or tumors it is drawn out to twenty-four or twenty six inches, according to the degrees of stretching of the abdomen, which I have known will reach twenty-eight inches from the pubis to the ensiform cartilage. The veins will correspond in elongation, but not in capacity, they appear to superficial observers much larger than natural, while in reality they are not so; they, like all the other tissues, are merely expanded in length and breadth, but not in capacity, for, on close examination they will be found, although much broader than usual, to have no more or less capacity than usual, by reason of the approach of their anterior and posterior sides, rendering them into flattened tubes, which shape, however broad, is of small capacity, by reason of their diminished area. This state of the veins, it may be mentioned here, is very striking in appearance on the surface of any abdominal tumor, so much so, that I have heard spectators of an operation exclaim "how varicose the veins are," while no varicose state exists.

Once more: All the tissues that conspire to constitute the abdominal parieties are stretched by tumors equally. The skin so much so as to suffer long lines of partial rupture of its chorion, ruptures that are never recovered from, and which leave those marks constantly seen in women who have borne children, wrongly called vergitures. The muscles, their tendons and fasciæ also spread out greatly both in length and breadth, but not in thickness, for there is no growth. Each rectus, instead of being only two and a half inches wide, expands to four or more; its sheath increases proportionately, as I have seen when a bungling operator deviating from the medium line, has laid the sheath open, the edges of the muscles not reaching its breadth and not filling its capacity. The length of the rectus with its intervening tendons, in extreme cases, has been twenty-eight inches, instead of ten or eleven, the usual length. What the muscles just named have suffered, all accompanying tissues with their nerves and vessels, have undergone in equal proportion.

The consequence of this expansion is, when the distending force, the tumor, is removed, the parieties, whose contractility has been greatly overcome, and to some extent lost, recover their primitive proportions very slowly, but never completely. This recovery is not wholly due to con-

tractility that interests all the molecules of the parts, it is partially so, but is mostly effected by a folding of the fibres one against another; in this corrugation the vessels and nerves participate, bending into numerous flexuosities, a condition that not only retards but obstructs the passage of blood through them, a state ill adapted to furnish that supply of blood which is *one* of the essentials of acute inflammation. Hence it is, that gastrotomy, for the removal of large tumors, is followed by very trifling inflammation, when the operation has been well performed, and the case well managed subsequently.

On the other hand, an abdomen that has not suffered the extension mentioned resembles other parts of the body as regards the inflammation that follows injuries, since the tissues are actively contractile like elsewhere; the vessels are short and round, with a full calibre instead of long, and in the case of the veins flat without capacity and contractility; the nerves also have been stretched and proportionally paralyzed.

Having hastily noticed the difference existing between idiopathic and traumatic inflammation, and the reasons why the latter is less to be dreaded than the former, especially in gastrotomy when performed on a stretched abdomen, I now proceed to examine the question of

TEMPERATURE OF THE APARTMENT

in which the operation is to be performed. The early operators, anxious for success, but having no facts to rely on, theorized in advance as to what might interfere with, or favor, the result; and, among other ideas, imagined that inasmuch as the temperature of the viscera was constantly near 100° Fahr., the room in which the operation was to take place ought to be heated to that degree, lest a colder atmosphere should provoke great irritation on the exposed parts. Had these practitioners called to mind the numerous cases of wounds through which the bowels have escaped, and been exposed for some length of time, and which subsequently did well, they might have banished the fear of cool air, and have saved themselves and their patient from the oppression of a torrid atmosphere. The length of time necessary to complete a well-conducted operation is so short, that a moderately cool air (between 50 and 60 degrees) has not time to act injuriously, while the heated room will prove far from beneficial. I operated on a patient living in a temporary house—a mere shanty—where there was no means of heating it, on a dark, rainy day in the month of December, while the temperature was so low as 46 deg. Fahr.—so low that our breath was visible, as was the steaming hillatus from the open abdomen of the patient. Not one anxious symptom followed, the patient recovered perfectly in twenty days, and has since become the mother of two children.

Another patient was operated on in a room opposite a large window, which was kept open to admit light, and through which blew a smart breeze at 60 deg. Fahr. This patient did well, and quite recovered in the space of three weeks. In every case that I have had since these, the operation has been performed regardless of either temperature, or exposure of the viscera to the air. Let, then, the heated bugbear be banished from the precautionary paraphernalia attendant on this operation.

HOT CLOTHS EMPLOYED TO PROTECT THE BOWELS FROM AIR AND TO RETAIN THEM FROM PROTRUSION

Constitutes the next injurious precaution that a false theory has engendered, put into practice, and is still in use by some operators; a practice that is even worse than that of the heated atmosphere just condemned. Any meddling with the protruded bowels is more injurious to them than to permit them to escape freely, should they do so, which does not always occur, and is most likely to happen when the tumor is small, because in that case the abdomen is more contractile that when it has been greatly stretched by a large tumor. Suffer the intestines to escape and remain outside until the tumor is removed. To see assistants busily engaged in futile endeavors to return the intestines during the operation, and by so doing embarrass the operator at a time that they cannot be controlled; to see loop after loop poked back and re-escape between the busy fingers of three or four hands; to see fruitless efforts made to restrain the truant parts—is a sight humiliating to a good and experienced surgeon. Does not the operator know that all this manipulating, pawing, fingering and poking among the slippery intestines, must interfere with, or remove, or abrade the thin varnish and epithelium that invest and protect the surface of the escaped parts; and that, under such treatment, they must become greatly irritated? Does he not perceive that such conduct is many times more injurious to them than could possibly be that air he so much dreaded, and uselessly heated? But the case grows worse when the hands of the assistants are armed with steaming hot cloths—even flannel bristling with sharp points of hair.

Imagination has become so exalted as to propose a protecting medium between the hands and the viscera, against their injurious contact with the peritoneal surfaces. This is, as far as it goes, an admission that contact (meddlesome hands) is injurious. To imbue the operator's hands with any material is to apply it to the surface where it is not needed; and there is no art that can make serum—a living substance—itself not destitute of life. While on this subject it may be as well to say that the best application to the hands is clean washing; and perhaps, coarse, hairy,

red, freckled, and sweaty hands had as well be excluded from participating in the operation.

(To be continued.)

On the Pathology and Treatment of Ileus. By GEORGE PATON, M. D., M.R.C S.E., &c., Bowmanville, C. W.

Continued from page 219.

IV. A patient who has hitherto enjoyed good health, is suddenly seized with ileus, and expires after a few days' illness. On inspection after death, a portion of intestine is found greatly distended, and immediately below this point, empty and contracted. Pathologists differ concerning the original seat of the disease in these cases. Is it connected with the dilated or the contracted portion of the intestines? We have seen that in cases where there is great and uniform distention, it extends throughout the whole tract of the canal—the gas in its passage along the numerous convolutions of the bowels, over-distending their muscular tissue, and impairing and destroying their function, and in cases where the distention is partial, that is, confined to a particular portion of the bowels, we are able to account for it, from an obstruction existing in the passage, interfering with the free descent of matters along the canal, and in accordance with a general law in the animal economy, gas is generated to a greater or less amount in the superior portion of the bowel, which on the impulse proceeding from above, over-distend the walls of the tube and impairs its functions. But have we any evidence or data to show that distention may take place and be confined to a particular portion of the bowel, without any obstacle or obstruction existing below that point to account for it? We think not. We know of no cause for the distention of a portion of the bowels, except the matters and generated gas which it contains. And if these are not arrested in their course, we do not see how the effect can be produced.

It has been stated by some pathologists as probable, that there arises at a certain period of ileus a loss of muscular power in a portion of the intestinal canal, in consequence of which it does not act in concert with the other parts, but becomes distended by the impulse from the parts above, which in the healthy state would have excited it to contraction.* But as stated, there is no proof to shew, that the muscular power of a portion of the intestinal canal can be lost or destroyed, when inflammation is not present, except by the over-distention of the part, and this

* Dr. Abercrombie on Diseases of the Stomach and Bowels, page 137.

can only be effected by the matters and gas which it contains, being arrested in their course,—exerting a pressure from within. The loss of the muscular power is the consequence of the distention of the bowel —not the cause of it.

If that hypothesis is not applicable to the distention of a portion of the intestinal canal, we do not see how it could explain these cases when a great and uniform distention existed throughout the whole. It is not easy to understand how the whole of the tube could lose its muscular power at once and then become distended; or if it took place by degrees, how it could be affected, except by the gas contained within its cavity.

If we are permitted to argue from analogy, it will be seen that in other cases of ileus attacking adults, the contraction of a portion of the bowel is intimately connected with obstruction existing at the part. Why should it not be admitted in the cases, now under consideration?

In the case of a post mortem examination, the patient aged 20, having died of ileus—strangulation of the intestine, after undergoing a severe operation. * * * "The omentum was cut through transversally about its middle, and the intestines below exposed, which were greatly distended with gas. Where were found to be portions of the ileum, the coils of which were more or less adherent to each other, to the mesentery, omentum, and to the neighboring organs, by bands of chronic lymph. The adhesions were now carefully torn through, the gut liberated, and traced downwards. Exactly five feet and a half from the cœcum, above and to the left of the umbilicus, the intestine was constricted by a band of lymph, as if a ligature were tied round it. Above the constriction the gut was distended to about the size of the wrist; below it was collapsed to the size of the little finger. Air could be passed from the superior portions into the inferior, but the passage of water poured from above was completely checked at the seat of stricture. All the intestines above the stricture were greatly distended with gas; those below it, including the cœcum, colon, and rectum, were small and collapsed.*

In another case, where a man aged 29 died of ileus, after nine days, illness, there was obstinate constipation of the bowels, which no medicines could overcome, distention of the abdomen—and feculent vomiting. The post mortem appearances—"Redness of the mucous membrane lining the stomach and upper part of the ileum; the transverse arch, and descending portion of the colon to the sigmoid flexure, distended

* Edinburgh Medical and Surgical Journal, No. 167—page 302.

with fluid fæces. Below this, the intestine was contracted so as scarcely to admit the little finger; and this contraction extended throughout the remainder of the intestine, downwards about twenty inches, through the rectum to the anus. A rent was made whilst removing the intestines from the body, in the mucous membrane of the sigmoid flexure of the colon, from the weight of the feculent matter above the stricture."*

In the first of these cases, the strangulation of the bowel arrested the descent of the flatus and feculent matters, and below this, the intestine is empty and contracted. In the second case we find a strong contraction of the bowels to the extent of twenty inches, preventing the further descent of the matter along the canal. Was this a natural or morbid condition of the parts? Pathologists who believe that the distention of the parts above, was totally unconnected with this contraction of the parts below, consider this portion of the bowel to be in a natural condition, but empty and contracted. But we are of opinion that we do not find a portion of the bowel in its natural healthy state, either in the dissecting room, or during pathological researches, so strongly contracted as this,—and that it depends on morbid excited action of the parts, and gives rise to the distention that exists above. Dr. Boyd of St. Marylebone Infirmary, lecturer on Practice of Medicine, who examined the state of the parts after death, and reports the case, seems to entertain the same view, for he terms it a *stricture.*†

What is the cause of the contraction of a portion of the bowel? We have already seen that the urethra becomes so firmly contracted during irritation of its mucous membrane that suppression of urine is produced, requiring the catheter for its removal. And in the experiments of Magendie on animals, whilst the lower part of the œsophagus was contracted, he was unable to force any of the contents of the stomach into it, but during its relaxed state, fluids escaped into the œsophagus from the stomach by the force of gravity alone (Muller); and there can be no doubt that a part of the intestinal canal may become so strongly contracted, on irritation of its mucous membrane, as to resist the impulse from above. This we have distinctly seen in analogous cases to which we have referred, the contracted portion of the bowel, being reduced far below its natural calibre, and we believe this is a general law in the animal economy.

A gentleman aged 31 years, was seized with sickness, vomiting and severe twisting pain in the bowels, confined chiefly to the left of the umbilicus, and occurring in paroxysms. Could bear pressure over

* Edinburgh Medical and Surgical Journal, No. 151—page 274. † *Ibid.*

the part, but it seemed slightly to increase the pain. The bowels were obstinately costive. He was bled, fomentations were applied to the abdomen, and afterwards blisters. Purgatives and enemata were exhibited, and every remedy which the nature of the case appeared to suggest was employed by his medical attendants with the greatest assiduity, but without affording relief. The abdomen became swollen, hard, and tympanitic —Prostration increased, and he sank under the disease twelve days after its commencement, no evacuation of the bowels having been obtained.

Inspection.—The lower portion of the ileum to a considerable extent, was contracted and empty, and immediately above this the intestine was greatly distended with gas and liquid fæces—It again became contracted for several inches, and above that was much distended with gas to the commencement of the small intestines. Several places of the distended portion of the bowels were of a dark livid color. On examining the contracted portion of intestine, it seemed much smaller in diameter than is met with in a natural contracted state of the bowel,—did not admit the point of the little finger,—and was totally impervious to air or water, on being attempted to be forced along it from the superior portion of the bowel, as was distinctly ascertained on repeated trials.

A gentleman aged 34 years, on a warm day in summer, when thirsty, drank a glass of ale, from which he experienced no inconvenience at the time; but during the night was seized with severe griping pains in the bowels, below and to the left of the umbilicus, which returned at intervals. Was sick, and felt an oppression at the epigastrium, as if a load were placed over it. On raising his head from the pillow was strongly inclined to vomit. Bowels constipated, and flatus not permitted to pass. On taking a little hot milk or other fluid felt relief, but soon after a commotion began in the bowels, extending downwards to the spot below the umbilicus, where it was arrested, and then the pain amounted almost to tormina; coils of intestine could be felt rising through the parietes of the abdomen, and the movement becoming inverted was succeeded by vomiting. The abdomen became slightly tympanitic. A mustard poultice was applied over the bowels,—he took antispasmodics, and employed enemas, but no evacuation was obtained during all that day, and the next night. On the second day, whilst persevering in the use of these remedies, with antacids, a small quantity of flatus passed the obstructed point in the bowels with considerable relief to his sickness and sufferings—and shortly afterwards a small scanty stool was obtained. By continuing the use of the enemata, the bowels were more freely opened; but during that period, severe pain was felt at the obstructed part, and the stools passed away from the bowels as from a syringe or by

jerks. For several days during recovery, pain was occasionally felt at the seat of the previous obstruction, as if some irritating substance had come into contact with the part, and had difficulty in passing along the bowels. Exposure to cold also produced it, and the pain was always relieved by heat, or warm cloths applied to that part of the abdomen.

This case seems to show that contraction may take place in a portion of the bowel, from some source of irritation, sufficient to give rise to the distention of the portion above, by preventing the passage of flatus and feculent matters. And that though complete at the time, it may only be of a temporary nature, as perfect recovery in this case took place, and the gentleman is now in the enjoyment of good health.

On a review of the subject, we think there is sufficient data to show, that the great distention of the whole intestinal canal that occurs in some cases of ileus, depends on the gas being retarded in its passage along the convolutions of the bowels. For if it were expelled from the bowels with as much rapidity as it is formed, distention could not take place; but being retarded and subjected to the *vis a tergo* it over-distends a portion of the bowel and weakens or destroys its muscular power. Irregular peristaltic action now takes place, and the gas, continuing to accumulate, reacts against other portions of the bowels in a similar manner, till a great and uniform distention of the whole intestinal canal is produced,—and is rendered incapable of performing its functions. In this manner we reduce all cases of distention of the bowel, general and particular, under one general law, viz., retardation of the gas and matters along the tube; and subjection to the *vis a tergo*.

It is probable that the formation of this gas is intimately connected with certain articles of food, or condition of the digestive organs at the time. We know that gas is formed in the stomach and intestines—developed during digestion in the whole extent of the intestinal canal (Muller), and when from errors of diet or state of the mucous membrane of the bowels, the gas is formed in great excess, it may, in the manner we have mentioned, produce great and uniform distention of the intestinal canal, and destroy its functions.

On the other hand, when no physical obstruction exists in any part of the bowels to account for the attack, the contraction of a portion of the bowel that takes place as in class IV, is intimately connected with acidity of the *primæ viæ*, as in the majority of cases that have come under our notice, the patients had been eating some sour or acid articles of food, shortly after which ileus commenced. In these cases we have not only the contraction of the bowels to overcome, but the distention that exists above, which, if it be great and have continued for a time may have weakened and impaired the muscular power of the part.

In most cases, at the commencement of the disease, when the patient is seen shortly after the attack, antacids, as magnesia, combined with a little aromatic powder, given in hot milk in small and frequently repeated doses—or carbonate of ammonia or some of the other alkalies, will be found of great benefit, at the same time, applying warm fomentations to the bowels—or mustard poultices, and exhibiting enemas. Indeed in cases of ileus in general, we believe that acidity exists to a great extent in the *primæ viæ*, and is intimately connected with the cause of the disease. And our object in this communication, is to draw the attention of the profession, to what may be termed the *antacid treatment* in the first stage of ileus.

M. J., a farmer, aged 52 years, on the 17th of September, 1860, partook at dinner of several slices of cucumber prepared in vinegar, and in the afternoon felt sick and inclined to vomit. During the night he was seized with severe griping pain in the bowels, stretching across the epigastrium, and occurring in paroxysms. Pressure on the part appeared to increase the pain. The paroxysms returned frequently, contracting the abdomen, and drawing him together as he stated, and then the pain amounted to tormina—was often succeeded by vomiting. Pulse 74; he had taken castor oil, but no evacuation of the bowels had been obtained, and flatus could not pass. Was bled, antispasmodics were exhibited, a mustard poultice, and warm fomentations were applied to the abdomen, and an enema given and repeated—and after several hours, no relief was obtained by these remedies. Doses of magnesia combined with aromatic powder were then given in hot milk every twenty minutes, and after taking several doses, he expressed himself easier. The paroxysms began to abate, and flatus had passed from his bowels. In a few hours an evacuation was obtained. Next day he was free from pain, and was soon convalescent.

A gentleman aged 35, Dec. 5th, 1863, was seized during the night with severe pain and twisting in the umbilical region. It occurred in paroxysms and was succeeded by vomiting. Obstinate constipation of the bowels, and flatus not permitted to pass. States, that last night he ate a few nuts, and drank a quart of cold cider, after which he felt uneasy, and severe pain in the bowels, commenced about two o'clock in the morning, accompanied by nausea and vomiting. Pressure could be applied over the part without the pain being increased. The bowels were slightly tympanitic. Pulse 64.

Was ordered at ten o'clock, a.m., small doses of carbonate magnesia and aromatic powder, every twenty minutes in hot milk till several doses were taken, at the same time to apply a mustard poultice over the abdo-

men. And after relief from the pain was obtained by the powders, to employ an enema. About one o'clock, p.m., the severity of the symptoms had abated. Flatus had begun to pass along the bowels in small quantities, and a partial stool had been obtained by the enema. Continued the medicines at intervals, and exhibited another enema, and in the evening he was much relieved—symptoms favorable—next day he was convalescent.

A young man aged 24, during the last twelve months, has suffered much from pain of the bowels and constipation. The pain is seated in the lower half of the abdomen, towards the left lumbar region, and the spot is slightly tender on pressure. He is troubled much with belching of wind, acid eructations, and flatulent distention of the abdomen, which is always increased by certain articles of diet, as vegetables and potatoes—drinking beer or diluted spirituous liquors—and by exposure to cold and fatigue. On these occasions his bowels become obstinately costive—flatus is confined—and uneasy sensations entered through the abdomen—appetite impaired, pulse 68. Percussion over the part elicits a dull sound, but immediately above it is tympanitic, and the convolutions of the intestines can be distinctly traced—there is evidently contraction existing at a point of the bowel, interfering with the free descent of matters along the canal, and giving rise to the distention above. Purgatives had been employed, and medicines to promote digestion. But antacids are the remedies from which he has felt most relief, as the pain and severity of the symptoms generally abate in a few hours after they are exhibited.

In the early stage of ileus, then, or during the severe attacks which occasionally occur in cases where a physical obstruction exists at some point in the bowel, diminishing its diameter, antacids will be found beneficial, with the application of a mustard poultice, or fomentations to the abdomen, and the exhibition of enemata. But when the disease is more advanced, other remedies must be adopted in accordance with the symptoms developed. The tobacco injection to mitigate what has been termed spasmodic action of the bowel,—turpentine enema to diminish the flatulent distention—and bleeding to subdue inflammation when it has commenced, have proved of essential importance; and been much insisted on by authors who have written on the subject. In one case which we witnessed during our attendance at the hospital in Edinburgh, when the disease arose from some irritating substance which the patient had taken to open his bowels, and repeated without medical advice; and when all the usual remedies had been tried and failed to afford relief, Dr. Alison succeeded in obtaining an evacuation, after the bowels had

remained obstinately shut for twenty-three days, by bringing the patient's system slightly under the influence of mercury. The case, we believe, was published at the time. But we observed that afterwards the patient was much troubled with flatulent distention of the bowels, and required the constant use of antispasmodics on account of the flatus that was formed. The stools were also smaller than natural, and the bowels retained a great tendency to constipation.

It will be seen that we strongly dissent from the view which has become somewhat popular of late, that ileus depends on inflammation of the muscular coat of the intestines. We have shown, that the disease may commence and proceed to a fatal termination independent of inflammation; and when it arises, it increases the loss of the contractile energy of the bowel, and accelerates the fatal result, and that the real cause of ileus is the retardation of the matters and gas in their passage along the intestinal canal; in consequence of which they react against its walls, enlarge its calibre, weaken and impair its muscular power, and ultimately destroy its functions.

Bowmanville, C. W., 1864.

Croton Oil in Neuralgic and Rheumatic Affections. By S. C. SEWELL, A. M., M.D., Edin., L.R.C.S.E., &c., Ottawa.

Some five and thirty years ago, *tic douloureux*, then rather a novelty to the profession, attracted a good deal of attention, and every possible thing was tried for its alleviation or cure. Among the farrago was croton oil. From the details of the cases this made a great impression on me, but it was not adopted by the profession, and soon dropt out of notice. It was not till the year 1843, that a very bad case of *tic* came under my care in the Montreal General Hospital. The man was aged forty-five, had been afflicted for several years, and latterly his sufferings were almost continuous. I tried acupuncture, iron, and other remedies then in vogue, without success. I then had recourse to croton oil with most marked benefit, which was increased by the local application of carbonate of lead. In a few days, he left the hospital well, and continued so for nearly a year. He was always able to cut short the attacks by using the same means. I afterwards employed croton oil in other neuralgiæ with most gratifying results. Here are two cases of sciatica selected at random to shew the rapidity with which relief is afforded. In January 1853, was sent for to Sandpoint to see Mr. A. M., aged fifty-six. He was suffering under fearful sciatica. The history of the case was that he had had five or six attacks, and had never experienced any relief un-

der a fortnight or three weeks. I gave two minims of croton oil. The bowels were acted on with progressive relief to the pain, after every evacuation, the lancinating stabs diminished in intensity, and in seven hours there was only a slight dull pain between the sacrum and femur, and he was able to walk about. He got three quarters of a grain of muriate of morphia repeated for two or three nights, no farther treatment being required. He was ordered pills of croton oil and ext. coloc. comp., half a drop in each dose to take when another attack came on. He was thus enabled to cut short the attacks for years, and has now been free from them for three or four years.

Case No. 2. October 4th, 1864, at 5 a.m., was called to see Mr. H. M., who had sciatica of the left nerve. Had been ill for three weeks, said: "*that he had tried everything*" and was suffering worse than ever. He was lying on his right side, and could only turn his head a little to speak to me, and even that motion brought on a paroxysm sometimes. I ordered two drops of croton oil, which operated very copiously: at five that evening he was free from pain, got out of bed for the first time for three weeks, dressed himself, spent the evening with his family, and walked up and down stairs as well as ever he did in his life. After three or four days, the pain returned, but in nothing like the same intensity: the after treatment was in order as follows, turpentine, iron, iodide of potassium—the hot summer change of air; and, by the advice of a physician in New York, enemata of ext. belladonnæ at bed-time. In these and all other cases of neuralgia and rheumatism, where I have used this remedy, there is always a most extraordinary quantity of black fæces evacuated accompanied by very severe tormina. If the dose be repeated in two or three days, the evacuations will be natural and the tormina trifling. As these black stools always occur even if the patients have already taken Cooper's pills, calomel and jalap, or other drastics before my arrival, I am led to believe that there is some connection between most neuralgiæ and an impacted state of the saccula or valvulæ conniventes of the colon, otherwise it is impossible to explain where all these black fæces come from, and the relief to the neuralgic pain *pari passu* with the progress of the evacuation. That croton oil exerts a specific action over neuralgiæ is probable from the following experiments made on two cases of sciatica. I selected elaterium as being the purgative most analogous in its ostensible operation to croton oil, but the evacuations were attended by no relief to the pain. Half a minim of the latter given after the exhaustion produced by the former was over, gave the desired ease. There are certain forms of neuralgia almost wholly confined to women, although sometimes

effeminate men and onanists are afflicted with them. These are neuralgia affecting portions of the fifth pair of nerves, and always associated with oligaemia more or less pronounced. The principal seats are half the scalp or hemicrania, the vertex, the exit of the three branches of the fifth nerve upon the face, the frontal and supra-maxillary exits being more commonly the seats of pain. It must be first ascertained whether a diseased tooth be the cause of pain, or whether there be suspicion of malarial taint, one will require the dentist, the other arsenic, &c. There being no suspicion of either, we have to observe whether the paroxysm be attended by local congestion indicated by slight heat and redness over the affected nerve. If so. then muriate of ammonia gives speedy relief, to be followed by constitutional treatment such as iron, porter, exercise and the shower bath. Should there be no local congestion, then chloroform, aconitine or atropine, applied externally or entropically, give ease, as does tr. belladonnæ internally, the constitutional resources, being manganese and iron combined, quinine, exercise, sea-bathing, &c. But even in these cases we sometimes derive benefit from croton oil, where there is habitual constipation, or scanty blackish liquid stools, which often are present, when the bowels are loaded with fæces. In these cases, I give one quarter minim croton oil combined with ten grs. of pil rhei co. The following is an instructive case being one of malarious neuralgia. On the 10th January, 1864, I was called to see Mr. J——H——, at 7 a.m. For nine days he had been seized every morning with severe neuralgia of the right frontal nerve. At first it began at seven a.m., but each morning it began earlier, and this day had awakened him at five o'clock. It always went off at one p.m. I ascertained that at the age of three years he had had an attack of fever and ague, and was still residing on the same farm, he now being twenty-eight years old. The place had formerly been much afflicted with intermittent. I gave him a drop of croton oil, which operated in half an hour; the pain immediately ceased: keeping the malarious cause in view, I ordered a scruple of quinine to be taken at bed-time. The pain never returned. I afterwards extended the use of this remedy to chronic rheumatism, which I divide as follows:

1st. Where the minute ramifications of the nerves supplying the muscles, and more particularly the terminal nervous loops, are the seat of disease. In this form the pain is constant and relieved by heat; it is a true neuralgia.

2. Where the muscular fibres are the seat of inflammation; when uncomplicated with the former, pain is only felt during motion or on pressure. The sterno-mastoid, the deltoid and the deep lumbar muscles are

the most common seats of this form. It is alleviated by heat, and stimulating embrocations.

3. Where the periosteum and fibrous insertions of the muscles are at fault. Here the pain is deep-seated, affects principally the long bones, and is aggravated by heat, being worse when warm in bed. When the case has continued any length of time, the periosteum of the affected parts is always found thickened. I believe these cases never occur except where there is a mercurial, a syphilitic or a mercurio-syphilitic taint: these are amenable to iodide of potassium, biniodide of mercury, guiac. sulphur, ginger, medicated baths, &c.

4. Where two or more of the above forms exist together.

The first second and fourth forms are all benefited by the use of croton oil; the formula I usually employ is the following: ℞ ol. tiglii m ij. ext. colo. co. ʒ ij. M ft massula in pillulas xij. dividenda, sig. sumat i. vel. ij. vel. iij. p. r. n.

The first form being purely neuralgia, needs not to be illustrated by any cases; but it may be doubted by many whether the second form is equally benefited. I shall give a case. On the 20th July, 1860, 7 a. m. called on Mrs. W., æt. 22, who had been suffering for three days with "*crick in the neck*," which had continually augmented in intensity. The sterno-mastoid was slightly swollen, painful on pressure, and the slightest movement or even a person walking heavily across the floor, caused intense agony. This was without doubt a case of pure muscular rheumatism, I ordered a hot pediluvium and a liniment of equal parts of Fleming's tr. of aconite and laudanum with a little soap. An hour after, her husband came to me, and said that his wife could not stand the pain, and that something more must be done. I ordered two minims of croton oil, which she got at 9 o'clock. At 2 p. m. the pain was entirely gone. Pleurodynia is a good example of the mixed form, 1 or 2 being predominant. Commonly a hot foot-bath, fifteen grs. of Dover's powder, with or without a mustard plaster will remove the complaint in a few hours. Some cases however are more rebellious; these can be speedily cured in a few hours by the remedy in question.

In acute rheumatism, both fibrous and articular, I have fancied that it diminished the pain, and shortened the disease; but many careful observations are needed to establish its value in a disease whose treatment is still a matter of such discussion, that many doubt the utility of any mode of treatment.

It is to be remarked that the use of croton oil does not always or even generally exclude other treatment. If in a case of sciatica it be resolved to follow up the treatment, by oil of turpentine, time must be given to

allow the liquor sanguinis to re-accumulate, else one drachm will produce severe strangury.

Case of Puerperal Convulsions. Recovery. By HAMNET HILL, M.R.C.S.E., Ottawa.

My services were sought on the evening of September 13th, 1864, to visit Mrs. B., wife of a market gardener, residing about four miles from the city of Ottawa, who was represented to me as being in labor with her first child. On arriving at her house about 8 p.m., I found the family in the greatest confusion and consternation from the fact that Mrs. B. had been in almost constant fits of convulsions since midday or thereabouts, which were momentarily expected to terminate in death. The patient had hardly been conscious since the first recurrence of the fits; and when I arrived she was just recovering from the convulsive stage of the last one, but entirely without intelligence or any kind of consciousness whatever: the breathing was stertorous; frothy saliva was issuing from the mouth; the lips were of a leaden color; muscular system in a relaxed state; heart beating very powerfully; pupils much dilated; eyes staring vacantly; surface and extremities of natural warmth. She was thirty-seven years of age and about twelve months married. This was, of course, her first pregnancy; had enjoyed uninterrupted good health until now and was stout and robust. I was informed by her friends that so late as 10 a.m. she was occupied about the house with her usual domestic avocations, when she complained of indistinct vision; this feeling rapidly increased to total blindness, which was almost immediately succeeded by a very violent attack of convulsions. A physician residing nearer than myself was sent for, who, very properly, bled her from the arm; after his departure, during the convulsive paroxysms, the vein had frequently commenced bleeding again, evidence of which was to be found in the bandages around the arm and on the bedclothes; no benefit arising from the bleeding, the fits continuing every twenty or thirty minutes, further advice was sought from the medical attendant who sent back an antispasmodic mixture of valerian, castor, &c., with directions for its occasional administration, as there was nothing else he could do for her.

Having ascertained that the patient had arrived at full term and thinking that immediate delivery, if practicable, was of the utmost consequence to arrest these frightful attacks, I made an examination, *per vaginam*, and found the efforts of nature to perfect parturition were luckily so far advanced that the child's head was pretty low down in the pelvis; so without a moment's delay, I began to prepare for delivery with the forceps;

before I could get grease, &c., ready, another dreadful fit occurred: so soon, however, as I could get the patient into any sort of available position, I adapted the forceps and with much difficulty succeeded in bringing a living child into the world; the placenta came away after about the usual delay and with the ordinary amount of hemorrhage; in the meantime as the distressing appearances (with exception of returning consciousness) had, to a great extent, subsided, I fondly hoped that the worst was over; my anticipations were not realized, except for about a period of three quarters of an hour after the birth of the child. The countenance that had become tranquil suddenly became distorted, the eyes commenced rolling frightfully, and all the phenomena of puerperal convulsions were quickly redeveloped. So soon as quietude was resumed sinapisms were applied to the legs, some of the antispasmodic mixture was also administered two or three times, with much difficulty, as dysphagia existed to a very great extent, and only a very limited recovery from this state took place ere the convulsive phenomena were again and again developed threatening to finish her career at each successive attack. Under this state of things I obtained some boiling water into which I dipped a pair of worsted socks and applied them (on the wet moxa principle) up and down the spine from the occiput to about the sixth dorsal vertebra; the patient did not even wince during this otherwise very painful operation; over this blistered surface I applied a strip of emplast. cantha rides to keep up external irritation; two fits occurred after this application, but the attendants described all of those occurring subsequent to delivery as shorter and less severe than those previously occurring.

It occurred to me that the only remaining chance was to endeavor without loss of time to lessen the susceptibility of the nervous centres by the administration of a sedative; and, immediately after the last convulsive stage was over, but with the existence of stertor, I gave her thirty drops of laudanum in a teaspoonful of water, getting it down a few drops at a time; under the most favorable circumstances I certainly expected at least one recurrence of the convulsive attacks, but, at the end of half an hour, uneasiness and slight moaning were the only appreciable results, whether from pain of the neck or whether from the system as it were laboring with its conservative attempts to ward off another threatened attack, I could not say; but about one o'clock a.m., I threw myself down on the floor at her bedside, soon fell asleep, and the patient was not long in following my example. I awoke about 6 a.m., arose to see how matters were progressing; there had been no more fits, consciousness and intelligence were perfectly restored, the sole complaint was of the soreness of the neck, and the impossibility of making her understand that she

was the mother of a bouncing girl to whom I introduced her before my departure. Quietude was enjoined, and convalescence was uninterrupted and rapid.

Remarks.

All authors, and in fact all practitioners, agree in opinion as to the dreaded nature of cases of puerperal convulsions. Luckily they are not of very common occurrence; the statistics of frequency differing however, very much in the recorded observations of practitioners who have devoted themselves to the obstetric art as a specialty; to so great an extent does this variation occur that Dr. Cusack gives the average as one in seventy, whilst of 38,000 cases recorded by Madame Lachapelle one in 600 was the order of frequency, and Madame Boivin quotes from 20,000 cases one in 1000 or thereabouts; these anomalies are of course irreconcilable: taking, however a very large number of cases together, the frequency appears to be about one in 600 or thereabouts, so that persons in ordinary practice are not likely to see very many cases. The most common period of utero-gestation in which convulsions are likely to occur is during the last month of pregnancy, or in the first stage of labor previous to dilatation of the os-uteri, although instances are on record of the disease shewing itself at all intervening periods from shortly after conception to seven days subsequent to delivery, but observation would tend to show primiparæ and more particularly short, florid, and robust females are more frequently the subject of the disease than those of slim and delicate build.

The last remarks particularly refer to the case in point, which is peculiarly instructive as the convulsive phenomena were developed before the os-uteri was dilated, in all probability, or at all events before any symptoms of labor set in, so far as unskilled attendants could observe, and therefore clearly points to the nervous system as being in an exalted state of excitability, rather than to the state of congestion such as might have happened after great bodily exertion consequent on long-continued parturient efforts when the labor is somewhat lingering; and it is more than probable that cases of a similar nature to that I have recorded, would be little likely to be benefited by bleeding, though it was most certainly warranted, as the patient was strong and plethoric. What then shall be our treatment during labor? I think there can be no two opinions practically about the matter; *i. e.*, that so soon as delivery can be effected not a moment is to be lost in hastening that natural action, either by the forceps or turning, as we can hardly expect the disease to be checked so long as the fœtus is unexpelled under any treatment. With respect to the use of antispasmodics, I should be inclined to think that

during labor, little if any benefit would be expected; after labor they may or may not be of use: it is probable that they would at this day be looked upon more in the light of "a placebo," except in cases of hysterical convulsions, where they would be doubtless indicated. Bleeding, under certain circumstances, more particularly with due regard to the inception of the disease and habit of the patients has been highly and deservedly extolled; but my own practical experience would lead me to attach much value to the immediate vesication of the spine or upper portion thereof by the hot water moxa, should convulsions continue after delivery of child and placenta; this is the second very alarming case in which I have availed myself of this plan of treatment with most gratifying results; and I certainly credited the benefit to the very heroic application of counter-irritation to the cerebro-spinal system; it will therefore be for myself and others to give this treatment a trial in cases of a similar nature, whereby a more extended observation will show its merits or its uselessness.

Case of Extra-Uterine Gestation. By P. R. SHAVER, M.D., Stratford, C. W., Graduate of the University of McGill College, Montreal.

In June last I received a message to attend a poor woman in an adjoining county, who had been confined to her couch for about a month. Upon examination, I found the abdomen distended almost to bursting, and as hard as a board. The history of the case, as far as could be ascertained, was, that the unfortunate woman had had two living children, and one or two premature births. Her present condition was as follows: She had not menstruated for about five months. Had noticed the enlargement of the abdomen to be gradual, until the last four weeks, at which period she could not pass any water; and from that time the belly became enormously distended, and the urine passed away drop by drop. She had a frail ill-nourished body, and her system was much prostrated. On examining the abdomen with the stethoscope, as well as by percussion, could detect no fœtal sound, but readily recognised fluctuation. *Per vaginam* examination revealed a large tumor in the vagina pressing strongly against the rectum. Could not find the os uteri with the finger or the speculum. I then introduced the catheter,—having first satisfied myself that the enlargement of the abdomen was owing to the distended bladder,—and drew off a *gallon* of nasty, stinking urine. The bladder was perfectly paralysed. I endeavored a second time to find the os uteri, and as signally failed. I then administered chloroform, passed my hand into the vagina, pushed it far up into the pelvis; and

there, far above the arch of the pubis, I for the first time felt the os in a rigid, hard, and non-gravid condition. I then informed the friends that the case was one of retroversion of the uterus, producing retention of urine, with constipation of the bowels. The following day I had the patient removed into town, a distance of about fifteen miles, on a bed, thinking I might possibly restore the paralysed condition of the muscular coat of the bladder, by removing the urine two or three times daily; and as gestation progressed, the uterus might possibly rectify its own malposition. A day or two after her admission, a messenger came into my office, saying the woman was dying. Upon my arrival, I found abdominal bearing down pains, but no uterine propulsive power. Upon examination under chloroform, I found the os still in its former locality, above the arch of the pubes, and still in its rigid, undilated condition. The fruitless attempts at bearing down, which could not be resisted by the patient, continued for about an hour, and the tumor in the vagina making some progress towards the os externum. I saw the woman was getting pale, faint, and restless, with a constant desire to get out of bed.

The patient was evidently sinking, whereupon I immediately sent for Dr. Hyde in consultation; and when that gentleman arrived and made an examination, he was equally as much in the dark as myself. The tumor had now become nearly parallel with the fourchette; and during an examination being made by Dr. Hyde, it gave way, and a fœtus of about five months' gestation, dropped into his hand, alive, which died in five minutes after expulsion. The hemorrhage was frightful. I immediately passed my hand up through the rent, which, of course, I thought was in the uterus, and pealed off as well as I could the placenta. The woman was dead in ten minutes. The question for my friend Dr. Hyde and myself to determine was, whether this was a case of ruptured uterus? The husband, next day, in a most praiseworthy manner permitted a *post mortem* examination of the body; but for which the case would have remained in total obscurity.

Sectio cadaveris.—The body was pale, blanched, and perfectly bloodless. Upon opening the abdomen, we found the pelvis filled with coagulated blood. The uterus was empty, in a non-gravid condition, and perfectly retroverted: the fundus in the lower strait, and the os and cervix above the arch of the pubis. The left fallopian tube and ovary were normal. The right *fallopian tube* was enormously hypertrophied, and had during life contained the fœtus. Portions of the placenta and membranes were still adherent to the tube. The tumor which we had felt during life, was the right fallopian tube, and had passed down into the pelvis as far as was practicable, and had then given way, rupturing the

vagina at its union with the rectum, the child thus making its escape into the world *via naturalis*.

I have made a beautiful preparation of the whole organs engaged in this unique and unhappy case, and at some future period shall have much pleasure in presenting the specimen to my *alma mater*, the University of McGill College, Montreal.

PERISCOPIC DEPARTMENT.

Surgery.

ON THE ARSENIC-EATERS OF STYRIA.

By Craig Maclagan, M.D., Edinburgh.

In the spring of this year, at the conclusion of a short residence in Vienna, I resolved to visit Italy, and finding that my route led me through Styria, I thought it might be interesting to endeavor, by personal inquiry, to gain some information as to the reputed arsenic-eaters of that country; and as my travelling companion, Dr. Joseph Rutter of London, was also professionally interested in the question of their existence, we determined to make a short stay at Gratz, the capital of the duchy, and thence to make any excursions into the country, which the knowledge I might acquire should point out as necessary.

My object in the present paper is succinctly to narrate what I learned by actual observation; but before doing so I may be permitted to glance rapidly at the existing condition of our information on the subject.

Although medico-legal observations on this practice had already been made so early as between 1817 and 1820 (Professor Schallgruber, *Medecin-Jahrbuch des Oestreich Staates*, 1822) in Gratz, the first time that any great interest was manifested in Britain on the subject seems to have been when a paper by Dr. Von Tschudi, which had originally been published in one of the Viennese medical journals (*Wiener Medicinische Wochenschrift*, October 11, 1851), appeared in an English dress, and found its way into many of the popular as well as scientific publications of the time, including Chambers' Journal, and the late Professor Johnston of Durham's Chemistry of Common Life.

The embellishments which Von Tschudi's narrative received from other writers, as well as the apparently incredible nature of the original statement, caused it to become a subject of much discussion. The general opinion of scientific men in this country was, that the statements of Von Tschudi were not worthy of belief, and this view of the subject

was specially maintained by Mr. Kesteven, of London, in a series of papers which appeared in the Association Medical Journal for 1856, in which he quotes the opinions of the most celebrated toxicologists of the time, in confirmation of his own disbelief of the practice.

Careful inquiry, however was set on foot by other scientific men, both British and Austrian. Mr. Heisch, of the Middlesex Hospital, having put himself in communication with persons living in the districts where the practice existed, was enabled to quote several very interesting cases, which were very thoroughly authenticated (*Pharmaceutical Journal*, 1859–60, p. 556), and Dr. Von Vest, the Landesmedicinalrath for Styria, residing in Gratz, having issued a circular to the medical men in his district, asking for information on the subject, was enabled also to arrive at tolerably satisfactory proof of the existence of the custom. The most interesting example of it was communicated to him by Dr. Knappe, then residing at Obertzeiring, in Upper Styria, who had persuaded an "arsenikophagite" to come and live under his observation for a few days, and who not only was thus enabled to see the man take his dose, but was enabled to transmit to Dr. Schäfer, a practical chemist in the Styrian capital, a specimen of the urine passed after the ingestion of the drug, and which was proved to contain it.

The facts ascertained by Knappe were made known in Britain, by a paper by Dr. Roscoe, read to the Manchester Philosophical Society, and published in the Mechanics' Magazine; and the existence of the practice has been admitted by some scientific men who have written since the date of Roscoe's paper. Dr. Guy (*Forensic Medicine*, 2d Edit., p. 368), admits that Roscoe has brought forward "conclusive evidence" of the fact; but from its being denounced as incredible in most of our standard works which have occasion to treat of the subject, such as those of Taylor and Pereira, and from its having been strongly denied in some important criminal trials, as by Dr. Christison in the case of Wooler (*Edinburgh Monthly Journal*, 1855–56, pp. 709, 710); whilst Roscoe's valuable paper appears not to be sufficiently known, it seems to me the general belief in this country that there is no foundation in fact for the alleged arsenic-eating in Styria.

What seemed to result from the inquiries of Von Tschudi, Knappe, and Heisch, was this:—

I. That in various parts of Styria and the adjoining countries certain individuals were in the habit of swallowing daily, or twice or thrice a week, or at longer intervals, a certain quantity of a mineral substance,

called "*Huttereich*,"* for various purposes such as the improvement of the appearance, the rendering more easy the respiration during mountain climbing, as a condiment, as a tonic and stimulant, as a prophylactic against disease, and as a preservative of health; and that this so called Huttereich was arsenic.

II. That these individuals became, through custom, capable of taking doses of arsenic varying from one grain to several grains daily.

III. That its more immediate effect on the system was to make them lively, combative, and of strong sexual desire. This latter physiological effect may perhaps be held to be indirectly proved by the inordinate number of illegitimate children in some of these places, the proportion sometimes rising nearly as high as 60 per cent. of the total births.

Against all this was to be placed—

I. The experience of medical men in other countries, who have found that by the continued use of arsenic as a drug, even in fractional parts of a grain, certain consequences arose directly contrary to those experienced by the partakers of it in Styria.

II. The want of proof by analysis that the substance said to be taken was really arsenic; the absence of any chemical examination of the excretions of an arsenic eater, so as to prove that arsenic really had been swallowed; the want of any accounts of its effects when first begun to be used; or of any information as to the origin of the custom.

Most of these objections, however, have been removed by the investigations of Drs. Knappe and Heisch, to the former of whom I am indebted for much interesting information on the subject.

It is not at all surprising that in other countries there should be a prevalent impression of the non-existence of this practice in Styria, seeing that in Austria itself those who have not made special inquiries on the subject are generally sceptical as to it. Any one, therefore, passing through Austria and making casual inquiries, would most likely be told that the practice of arsenic-eating was not generally known or believed in. It is not difficult to account for this. The people who eat arsenic have the idea that it is regarded as a bad habit, and therefore one to be concealed as much as possible, just like opium-eating in this country; and they have the additional reason for concealing the practice, that from the strictness of the laws regarding the sale of poisons, they cannot get the arsenic by open purchase, as the opium eater in this country can

* I use the spelling adopted by Dr. Macher in his Medizinisch-statistische Topografie Steiermarks. Although the pronunciation of the Styrians makes it Hütrach, it is obvious that the word really is Hütten-rauch—literally, furnace smoke or vapor.

get his laudanum, and therefore they are generally obliged to purchase it from illicit dealers.

I now proceed to narrate what I have myself ascertained by personal observation. Though without an introduction to him, I called on the Medicinalrath, Dr. Von Vest, who, on learning the object of my visit, with great courtesy put at my command any papers that his office contained, and, in addition, supplied me with introductions to Drs. Knappe, Machar, and Tingler, the two former of whom I was fortunate enough to see, but I was unable to spare time to see Dr. Tingler.

Dr. Machar, now resident at Stainz, who is thoroughly acquainted with all the medical matters of Styria, and whose experience during a long period of active professional work there, makes his opinion of no small value, informed me that, although cognizant of the existence of the practice, he had little personal experience in the matter. He related to me, however, one case, in which a woman who had been tried for poisoning her husband with arsenic, had been acquitted, from "want of evidence," the plea for the defence being that the man had been an arsenic-eater. Though this defence was generally believed to be false, it shows, at all events, that the practice has in a court of justice been admitted to exist, and has served, in at least one instance, as a successful ground of defence.

Dr. Knappe, of Liegist, in Middle Styria, an hour's journey from Gratz, was my next informant; and when I first spoke with him of the case of J. W., already alluded to as the subject of experiment, and whose urine had been examined by Dr. Schafer, he described him as a small, strongly-built man, with a great muscular development, a wood-cutter by trade, who had taken the drug for a period of twelve years. Dr. Knappe further stated to me that while personally ignorant of the actual existence of an arsenic-eater in the neighborhood, he could go with me to Upper Styria, and show me the above man, but he suggested that we should first make inquiry in the village, whether or not any of those persons described to him as *indulging* in the habit could not be got to take a portion of it before me. I accordingly slept in Liegist that night, and next morning I had the satisfaction, in presence of Dr. Knappe and my companion, Dr. Rutter, of having my first interview with an arsenic-eater.

Case I.—Mathias Schober, a healthy-looking, fresh complexioned, fairly muscular young man of the age of twenty-six years, and about five feet nine inches in height, a native of Liegist, and employed as a house servant there, said he had taken hüttereich for about a year and a half, not, however, white arsenic, but the yellow arsenic or orpiment, of which he took a specimen from his pocket and showed it to me. Of this I

retained a piece for chemical investigation. He informed me that he took the arsenic in order to keep strong, though he had never suffered from ill health. He said he had never experienced any bad effects, even when he first began using it, that he had at first taken rather less than a grain every fortnight, that he now took it twice a week, and that on omitting to take it for any longer period, he experienced a longing for it, which was relieved by a repetition of the usual dose. His reason for taking the orpiment instead of the white arsenic was, that it was more easily procured; but having professed himself quite indifferent whether it were arsenious acid or the sulphuret, Dr Knappe produced a paper containing the former (of which I also kept a sample), and having asked him to choose out a piece such as he was in the habit of taking, it was weighed and found to be nearly five grains; we had no finer weight than one grain, but the piece of arsenic was much over four, though less than five. Dr. Knappe having carefully ground this to powder on a clean piece of paper, it was transferred to a small piece of plain white bread, about as large as a man's thumbnail, and this the doctor put into his mouth; Schober chewed it and swallowed it, and then swallowed another portion of bread the same size immediately after. This was at 9.30 a.m. He stayed with us a few minutes, but he had to return to his work, promising however, to come back in a short while. This he did at 11.30, two hours after, and made water in my presence to the amount of what I estimated at twenty-eight ounces, into a vessel previously carefully cleaned, and the urine was put into bottles thoroughly washed by myself. Unfortunately, in the hurry of my departure, in trying to pack these bottles into my hat-box, I broke one, and thus lost part of the urine. Since my arrival in this country, I subjected the contents of the two remaining bottles to chemical analysis, adopting the distillation process of Dr. Taylor as the most convenient way of separating arsenic from the organic matters of the urine. For this purpose the urine was carefully evaporated to dryness in a clean retort; the nearly dry residue was covered with strong hydrochloric acid, and distilled into a well-cooled receiver. The product, amounting to about half an ounce, was a clear, feebly pinkish fluid, thirty minims of which, when treated both by Reinsch's and Marsh's process, gave very characteristic arsenical deposits.

Schober also came the following day to see me, having taken no more arsenic since the dose which he had swallowed before me twenty-six hours previously. I again secured some urine which he passed in my presence, and this, when chemically examined as above, also yielded arsenic freely.

CASE II.—Joseph Flecker, æt. 46, a muscular, healthy-looking, clear-

complexioned man, a tailor by occupation, told us that he had taken hüttereich, generally the orpiment, for a period of fifteen years. He first began to do so on the occasion of the inhabitants of a house, in the neighborhood where he lived, being attacked with fever; and when fourteen people had died in it, and no one would enter the premises, he determined to do so, and took, as a prophylactic, about one grain of arsenic daily for three successive days, while going to the infected house, and though he said he had not felt quite well at the time, he was unable now to describe specially what had ailed him; but on being asked if he had ever suffered from vomiting or irritation in the stomach, he said he had not.

The day before my interview with him, he twice, viz., at 10.30 and 3 o'clock, had, in the presence of several of the villagers of Liegist, and on one of those occasions in presence of the burgermeister, who informed me that he had seen him do it, taken a piece of the sulphuret of arsenic from his pocket, and scraped off a certain quantity of it on a piece of bread and eaten it. He brought with him a small bottle of his urine, which he stated to have been passed eighteen hours after the last of the two doses, and in which I have since found a considerable quantity of arsenic. The reason which he assigned for this public exhibition of his arsenic-eating capacities was, that it had become the subject of conversation in the village that two strangers had come a very considerable distance to witness an example of arsenic-eating, and inquire into the practice, and that he wished to make open demonstration of his assertion that he was capable of tolerating a considerable dose of arsenic. When he first came to me he seemed somewhat unwilling to take a dose that day, owing to his previous performance, and seemed to fancy it possible that he might have some slight irritation of the stomach, such as a feeling of warmth accompanied by thirst. He did not appear to be able to give any reason for anticipating this result; perhaps he intended it as a gentle hint that the thirst might require assuaging; at all events, having been informed that he should not want the wherewithal to quench it—(he confessed to being by no means abstemious in the matter of alcoholic potations), he, to satisfy our curiosity, picked out a piece of arsenious acid, from the same parcel that had been shown to Schober, and which, on being weighed, was found to be as nearly as possible six grains. This he placed entire on a small piece of bread, and taking it into his mouth, crunched it up audibly, and in about two minutes after swallowed six or seven ounces of cold water, stating that he liked to drink immediately after swallowing a dose, and on such occasions preferred water. I then made him open his mouth and inspected it narrowly, but found it quite

clear of bread crumbs or anything else, thus assuring myself that no jugglery could have been practised. After having swallowed the arsenic four minutes, he eructated slightly, but till he left us, a quarter of an hour after, he had no symptoms of any bad effect. The six grains were taken at 11.30, and at 12.15 he returned, and passed a small quantity of light-colored urine. Nearly the whole of this was bottled for exportation, and the twelve ounces thus secured were treated by the process of distillation above described, and also yielded a characteristic deposit of arsenic.

Flecker gave me the following account of his use of arsenic. He stated that he generally takes about the quantity we saw him swallow once a week, but with variations in the intervals, there being sometimes four days only, sometimes eight days between the doses. That when he has a distance to walk to his work, he takes a larger dose, and is then in good spirits for about eight days. That if he, however, intermits it for fourteen days, he feels stiff in the feet, with general lassitude and a craving for another dose. If his victuals are hard of digestion, he takes a dose to assist the stomach, and if he takes a rather full dose, he brings a good deal of wind off his stomach, but never vomits. He stated that his father had taken arsenic before him, and in considerable quantity, and that in the immediate neighborhood of Liegist numbers use it, several taking it daily, and many in larger doses than he. He said that all who take it are healthy—that he never knew of any one vomiting from its use, and he believed that, like the use of tobacco, if the dose is very gradually diminished, an arsenic-eater can break himself of the habit.

One of the objections which has been made to the acknowledgment of the reality of arsenic-eating is, that the substance swallowed has not been ascertained by chemical examination really to be arsenic. This link in the chain of evidence I am able to supply. The white substance which I saw Schober and Flecker swallow, part of which I have now in my possession, is pure arsenious acid. It sublimes into octohedral crystals, and leaves no appreciable residue. The yellow substance which Schober used is a fair sample of the orpiment of commerce, and contains, as that substance usually does, a considerable portion of free arsenious acid.

I am, of course, not in a position to give any opinion as to the extent to which arsenic-eating prevails in Styria—my time would not have permitted me to enter upon such an inquiry, nor would it be easy to get satisfactory information as to a practice which is generally kept secret; confirmation of the fact of its existence is more interesting to us scientifically than its extent; and that it is a fact, my personal observation enables me confidently to affirm. That arsenic-eating in Styria is a

universal habit, or one indulged in by even a majority of the male peasantry, I do not for a moment suppose; but the averment "that the story of the Styrian arsenic-eaters is not only unsupported by adequate testimony, but is inconsistent, improbable, and utterly incredible"—(Kesteven, *Asn. Med. Journal*, 1856, p. 811); or that these are "absurd and exaggerated statements, utterly inconsistent with all that is known concerning the action of arsenic in this or other countries, and but for the fact that they for a time received the literary support of Professor Johnston, and were diffused by him in an amusing book, they would not have required any serious refutation"—(Taylor, *On Poisons*, 2d Ed., p. 92); or that it is a "mess of absurdity," "a pure fable"—(Christison, *Edin. Med. Journal*, 1855–56, pp. 709, 710), are, although justified by the state of knowledge at the time they were made, no longer tenable; but, on the contrary, we can no longer doubt, to use nearly the words of Roscoe, "that decisive evidence has been brought forward not only to prove that arsenic is well known and widely distributed in Styria, but that it is likewise regularly eaten in quantities usually considered sufficient to cause immediate death."

It is probable that many of the physiological actions attributed to it are fanciful, and that its use is mixed up with a good deal of superstition, as, for example, in the case of the poacher who takes it to give him courage to pursue his depredations on ground that is new to him, or that of the ostler who, in giving it to his horses to improve their coats, thinks that it will have no beneficial effect unless he partakes of it at the same time.

It is evident that the confirmation of the existence of the practice of arsenic-eating must lead us to modify some of the opinions that are entertained with regard to the influence of habit on the action of poisons. It has long been notorious, that by habit the human body may be brought to bear with impunity doses of organic poisons, such as opium, which to those unaccustomed to them, would certainly prove fatal; but "it has hitherto been considered by toxicologists that, except within very narrow limits, habit appears to exercise no influence on the action of mineral poisons"—(Taylor, *On Poisons*, p. 89). Though the experiments of M. Flandin, by which he proved that he could bring dogs to bear fifteen grains of arsenious acid in powder in twenty-four hours without injury to their appetite or health, and the practice of administering arsenic to horses, have long been known as pointing rather in the contrary direction, this has been supposed to be due to some peculiarity in the constitution of the lower animals. The facts which have been ascertained with regard to the Styrian arsenic-eaters, and which the above observations confirm,

entitle us to maintain that the modifying effect of habit is not confined to organic poisons, but extends to those of mineral nature, at all events to arsenic.—*Edinburgh Medical Journal.*

NOTES IN MEDICINE AND SURGERY,

By Philip Crampton Smyly, M.D., F.R.C.S.I.; Surgeon to the Meath Hospital, and to the Institution for Sick Children, Pitt-street.

The methods recommended for the treatment of diseases of the larynx and trachea have become so numerous within the last few years, that it is not easy to compare their several advantages. One laryngoscopist advises solutions of various irritants, introduced by means of a brush or syringe specially constructed for the purpose; another blows very fine powders into the cavity; another galvanizes the muscular structures; another pulverizes fluids for inhalation.

All these devices have been called for by the obvious advantages of applying local applications to a diseased surface. Before the laryngoscope brought the lining membrane of the larynx and trachea into view, and revealed many diseases before only guessed at, the practitioner was content with a brush, or sponge on a stick, to apply remedies to the pharynx, or to touch, with nitrate of silver, any ulcerated spot he might see. Now that he can see, in many cases, down to the bifurcation of the bronchial tubes—in almost every case the whole larynx, and a great part of the trachea—he must mount his brush on a long curved stem, he must have his peculiar syringe, his laryngeal galvanizer, his polypus forceps, his écraseur, and his fluid pulverizer.

The object of these notes is to point out some of the advantages peculiar to the last of these—the inhalation of pulverized fluids.

Inhalation is not, by any means, a new idea: vapors have been employed from the earliest times, and air impregnated with various substances suspended in it, has been a remedy of well-known value—*e. g.*, the sea breezes in scrofulous disease. But inhalation of solutions of various medicinal substances, broken into a fine spray, is new; Sales Girons published his first clinical observations in 1857; the diseases in which the inhalations were found beneficial were pharyngitis, laryngitis, bronchitis, tuberculosis, &c. Since then many, both in France and Germany, have followed him, more especially within the last two or three years, and many instruments have been invented to break the fluid into spray. It would be out of place to enter on this extensive subject here, or on the discussion whether the spray, when formed, enters the air-pas-

sages at all or not, and if it does how far it can penetrate into the bronchial tubes. It is, for the present, sufficient to state, that the fluid impregnated with substances not otherwise volatile, can be broken into such fine spray that the solution may be inhaled without inconvenience, and that the medicinal agent may thus be brought in direct contact with the lining membrane of the bronchial tubes, even as far as their small ramifications.

The instrument I use is made by Mr. Krohne, after M. Lewins. It consists of a glass chamber, covered with an air-tight brass cap. In this cap a glass tube is fixed, almost touching the bottom of the glass vessel. The end, outside the brass cap, is drawn out to a capillary opening, and bent at an angle. Into another part of the cap an air-pump is screwed, to press air into the chamber, thus forcing any fluid introduced into the chamber through the capillary opening with very great force. A glass cylinder, open at both ends, and having a small round hole in the side, is fixed by means of a metal rod at a short distance, so that the stream from the capillary opening may enter the hole in the side. Opposite this hole a metal button is fixed, on which the stream strikes, and is broken into a fine spray which falls out of the cylinder at each end. The patient is then placed opposite one end of the glass cylinder, and by breathing draws a considerable portion of the spray into his air passages.

I have employed the pulverized fluid thus formed in several cases, and with very good results, in which I had before been employing other remedies without effect; these I will pass over, and merely give one case in which every other remedy either failed or could not be employed.

Mr. R. consulted me, about the end of June, 1864, complaining of a constant irritation of the throat, preventing sleep, and causing great distress. His throat was so sensitive that the examination with the laryngoscope was very difficult—almost impossible. However, after a time, I got a very good view of the entire larynx. The epiglottis was very red, the mucous membrane betwen the arytenoids and the false cords was congested and slightly excoriated. The vocal cords were quite white, except towards the sides attached to the larynx. I tried to touch the parts with a brush charged with a solution of nitrate of silver, but could not get it past the base of the tongue. I ordered, then, a strong gargle of bromide of ammonium, and to come again in a day or so. A few days after he returned, saying the gargle had done him some good. The examination was not quite so difficult, and I succeeded in passing a brush between the arytenoids. There was very little spasm, but he was attacked with violent vomiting, which continued for three hours; after this he would not allow a brush to be again introduced. He tried seve-

ral gargles, but without any effect, and inhaled the vapor of hot water, &c. He got worse and worse, so that for many nights he had no refreshing sleep. I then told him I had just obtained Lewin's fluid pulverizer, and that I wished to try its effect in his case. The first day he inhaled the spray of a (15 grains to the oz.) solution of nitrate of silver for about ten minutes; after the inhalation he said he felt the whole throat rather sore. Next day he came for a second application; the soreness, after the first, had quite gone off towards evening, and he had slept, without any disturbance from his throat, the whole night. The inhalation was repeated twice. His throat was so much improved that he was able, a few days after, to leave Dublin to travel for pleasure.

October 13th—Mr. R. has not had any return whatever after the second application of the spray of nitrate of silver solution.—*Dublin Quarterly Journal.*

GRANULAR SWELLING, OR BENIGN FUNGUS OF THE TESTICLE IN INFANTS.

By Christopher Fleming, M.D., M.R.I.A., &c., &c.

An infant, aged fourteen days, was brought to hospital with acute inflammation of the left testicle. No cause could be assigned for the attack. The health of the child, for its age, appeared to be perfect, and there was no trace of eruption or other disease of any kind. The mother was healthy, and had other children who were healthy; and, from her statement, it would appear that the attack in the child had commenced, some days previous to her application, with fulness and tenderness of the scrotum, and that those symptoms gradually advanced until they reached their present state. Now, the distinctive characters of "acute orchitis" on the left side existed in their most intense form. The scrotum, especially, was very much inflamed, and prominent in front of the testicle, which, with the epididymis, was so much enlarged as to equal the size of a large hen egg, and the chord was painful on pressure and much thickened. In the progress of the case there was considerable urinary irritation, at one time amounting to retention of urine, which required the introduction of a catheter. Treatment was adopted suited to the age of the child, but the mother could not remain in hospital. She attended from day to day for dispensary advice. Her poverty and condition, however, did not enable her to carry fully out the directions given her, when, at the end of a week, a slough presented itself on the thinnest and most prominent portion of the swelling of the scrotum. This slough was, in a short time, detached, when a granular growth pro-

truded through the opening, increased to about the size of a large nut, and ultimately assumed all the characters of the ordinary "granular swelling of the testicle." This disappeared under treatment, and, when the child was at last brought to hospital, the scrotum, the testicle, and the chord were gradually assuming their normal characters, and the ulcerated surface was contracted and cicatrizing. (A drawing of the appearances in the earlier and in the granular stage of this case has been taken by Mr. Connolly, and is now in the museum of the hospital.)

Diseases of the testicle, of the spermatic cord, and of the scrotum, are by no means of rare occurrence in the infant and child. Numerous instances pass under my observation. Limiting my present remarks, however, to the subject of "orchitis" at those periods of life, I would say, that seldom or ever a month passes over without my witnessing one or more of such class of case in its acute or chronic form, and involving one or both testicles. The above case is deserving of record, as well on account of the early age of the child, as of the rapid progress, and peculiar termination of the case itself. In child or in adult "acute orchitis" seldom terminates in even a disposition to "granular swelling"—it is rather the exception than the rule that suppuration takes place; and when so, the reparative processes are too quickly accomplished to admit of that morbid growth.

In the majority of instances of "chronic orchitis," an induration of the body of the testicle, and of the epididymis, as in the adult, continues for a variable time, and gradually subsides under treatment—in others, again, this hardness is accompanied by effusion into the cavity of the tunica vaginalis, just as in the adult, constituting what has been termed hydrosarcocele, which also disappears under treatment—whilst, in a third class of cases, suppuration will equally supervene, will pass through stages familiar to all practical surgeons, but will not end in the "granular swelling of the testicle," unless from great local neglect. Indeed, when we bear in mind the anatomical character of the disease, it is quite intelligible that much care is required in their local management. All undue pressure should be avoided, especially in their inflammatory stages, and thus the integrity of the delicate structure of the scrotum on the one hand, and that of the investments of the testicle on the other, will be protected. Destruction of a greater or less portion of the scrotum must otherwise ensue in the first instance, whilst in the second a fungus, merely *superficial*, may be converted into that *deep* form, in which the proper tissue of an important organ is necessarily involved.—*Dublin Quarterly Journal.*

Canada Medical Journal.

MONTREAL, DECEMBER, 1864.

In the last number of this periodical we referred to the great necessity there exists for the appointment of an officer of health for our city; and although the article in question was reproduced in several of our leading daily papers, yet so far no notice has been taken of the suggestion by our city authorities.

It is to be regretted that such apathy exists; and it is far from encouraging to us that the warning, which all must allow was well meant, and of the force and necessity of which all will admit, is permitted to sink into forgetfulness as an idle tale, or one unnecessary because of being unpalatable. Have we facts to bear out the views already made public in the columns of this journal? Is it a fact that the mortality of Montreal is greater in proportion than any other city of its size on the world's surface which enjoys equal physical advantages? Is it a fact that each year we send for burial hundreds of individuals, who, under more favorable circumstances, would be spared to become of use, and add to the importance of our community? Is it a fact that pulmonary consumption and all diseases of the lungs, are with us of more frequent occurrence than formerly, an increase greater in proportion to our increased population? Is it a fact that disease in its most loathsome form is of more common occurrence, (we refer to small-pox), making no distinction of persons, entering alike the houses of wealth, comfort, and luxury, as of those where filth, squalor, and poverty reign supreme? These are questions we would ask our fellow-citizens; and if they seek the remedy, we are equally ready to reply. If our corporation have not the power already, let them go to the legislature of the country and obtain it. "A Nuisance Removal, and Disease Prevention Act," one similar to the act bearing the above appellation and at present in full force in Great Britain, is much required in Canada. By the provisions of that act, the officer of health can look into all things which are liable to affect the sanitary condition of houses, localities, or even individuals, and if need be, proceed summarily against all offenders. Over-crowding, the most fruitful source of disease, is specially looked into. It has but

recently been held by the magistrates of London that 500 cubic feet of breathing space is necessary for each adult, and 300 cubic feet for each child under ten years of age, and that all premises affording less than this amount, are injurious to health. Now what has been the result of all these stringent sanitary measures? London before the inauguration of the present system, registered an annual loss of forty individuals for every 1000 of its inhabitants. The present annual death-rate is twenty-three per 1000 with a prospect of steady decrease. In Montreal our present annual death rate is about thirty-four per 1000; while the country districts average from seven to nine per 1000. We cannot see why the rate could not be very much reduced by careful inspection and the adoption of strict sanitary measures. We have been told to wait and see the results of the improved drainage which is being developed. We freely admit that much benefit will result, but this will only be a temporary lull. Let no man imagine that the office of health inspector is a sinecure. Work has to be done, much judgment is required, weekly reports have to be drawn out, mortality bills have to be consulted, and localities have to be inspected. The officer of health to be of any use to a community must be a working man, and as such he deserves to be well remunerated for his work. If he is a drone, and knows nothing of the details of his duty, the city would be better without his services. We must again press this matter on the serious consideration of our citizens, and again advise a careful investigation into the many necessary sanitary reforms needed.

MONTREAL GENERAL HOSPITAL.

We feel sure that many of our readers take an interest in this noble charity of which our rapidly increasing city has every reason to be proud; and we therefore avail ourselves of the receipt of its forty-second annual report, to glean from it a few particulars, concerning its operations during the past year. The total receipts from all quarters were $15,534.63. On looking into the sources from which this revenue was derived we find that the large sum of $1,342.81 was from pay patients, and that students fees gave $338.51. The expenditure was $15,040.05, and the total number of persons, who participated in its benefits was 8940, of whom 1291 were admitted into Hospital, and 7649 were treated as out-door patients. Of those admitted, 1122 were cured or relieved, and 65 died, and at the date of report 104 were in hospital. The great prevalence of small-pox, last winter, has brought the committee of management to see the absolute necessity which exists for the erection of a separate building for the accommodation of persons suffering from this loathsome disease,

and they strongly recommend that such a building be erected. We need hardly add our testimony to that of the committee of management: they feel its necessity—so do we—and we sincerely hope that another year will not pass away ere we see such a building being erected. Thus far, however, we have not heard of any further action having been taken in the matter. Within the last few years a number of very great improvements have been made in the internal arrangements of the building, which have not only greatly contributed to the comfort of its unfortunate inmates, but in a sanitary point, have been invaluable. As we write a new surgery has just been completed, in the centre of the building, which contains every convenience to be desired, and the old one fronting on St. Dominique street, will of course be closed. While upon the subject, we would earnestly call the attention of the committee of management to what has been for years a crying grievance, and one which we wonder the attending physicians have not sought to have remedied long since. We allude to the room used for an operating theatre, which is totally unfit for the purpose it is intended to serve. It has been our good fortune to visit many of the operating theatres of American hospitals, and almost every operating theatre in all the leading cities of Great Britain, and they are so constituted, the light being entirely from above (much the same as a photographist's room), so that the operations are performed facing the students. The room at the Montreal General Hospital receives but little light from the semi-sky-light; the principal light being given from a window opposite the operating table, the result of which is that all operations are performed facing this window, and *away* from the students. During the session of the University of McGill College where over a hundred students are usually present at operations, so far from gaining any practical information from being present, the majority would learn more by studying in their own rooms. The students now contribute a good sum (last year $338.51) yearly to the hospital, and their just claims should be promptly met. In our last, we published a letter signed "Several Medical Students," calling our attention to the matter, and we feel they have good ground for complaint. We are confident that now we have fairly brought this matter before the committee of management, they will, as promptly as is in their power, apply the proper remedy. We cannot close this notice without bearing testimony to the unwearied exertions of the managing committee, for the welfare of the institution, principal among whom is Thomas Morland, Esq., to whom, in a great measure, are due many of the recent improvements and alterations.

THE MONTREAL DISPENSARY.

A special general meeting of this corporation, called by requisition, was held at the institution, Fortification lane, on Monday afternoon. The following members were present: W. Workman, Esq., President, in the chair; Rev. E. Wood, M.A.; G. H. Frothingham; Dr. Fenwick; A. West; T. A. Evans; L. N. Duvernay; S. C. Bagg; P. D. Browne; J. S. Hunter; and A. N. Rennie, Esq., Secretary.

The Chairman having called upon the Secretary to read the requisition, and the advertisement convening the meeting, Dr. Fenwick placed in his hands the formal resignation of Dr. R. P Howard, one of the attending physicians. Dr. Fenwick also read applications from the following candidates—for the vacancy created thereby, and also that caused by the death of Dr. T. W. Jones—Drs. G. P. Girdwood, Lemire, John H. Pickup, W. W. Squire, E. H. Trenholme, J. P. Rottot, and W. E. Bessey.

The meeting having proceeded to ballot for the candidates, the scrutineers, Messrs. Bagg and Browne, returned as elected Dr. Girdwood and Dr. Squire.

The Chairman announced that the next business was to elect six consulting physicians, when the following were unanimously appointed: A. Hall, M.D.; W. Wright, M.D.; R. P. Howard, M.D.; J. P. Rottot, M.D.; and J. L. Leprohon, M.D.

On motion of J. S. Hunter, Esq., seconded by S. C. Bagg, Esq., Dr. G. E. Fenwick was unanimously elected Vice-President of the Institution.

A vote of thanks having been passed to the Chairman, the meeting broke up.

We are pleased to learn that the vacancy in the staff of attending physicians of the Montreal General Hospital, created by the recent death of the late lamented Dr. Jones, has been filled by the appointment of George Edgeworth Fenwick, Esq., M.D.

Having been for the last seventeen years engaged in general practice, and having occupied the chair of Materia Medica in the St. Lawrence School of Medicine, and being at present the Demonstrator of Anatomy in McGill University, and co-Editor of the *Canada Medical Journal*, he is certainly entitled to the honor the Governors of the Hospital have conferred upon him. Such of his colleagues as have been brought into personal contact with him at the bedside, and have had an opportunity of procuring an opinion from him as a practitioner, can testify to the soundness of his judgment and the skill of his hands. His unassuming gentlemanly deportment and honorable feelings are known to all his confrères.—*Communicated.*

ABSTRACT OF METEOROLOGICAL OBSERVATIONS,

Taken at the Montreal Observatory, Latitude 45° 31′ *N. Longitude,* 4*h.* 54*m.* 11*s. W. of Greenwich. Height above level of the Sea* 182 *feet. For the month of October,* 1864.

BY CHARLES SMALLWOOD, M.D., LL.D., D.C.L.

Day of Month.	Reading of the Barometer, corrected, and reduced to 32° F.			Reading of Thermometer.			Mean Tension of Vapor.	Mean Humidity of the Atmosphere.	General direction of Wind.	Horizontal movement in 24hours in miles.	Mean extent of Clouds in 10ths.	Depth of Rain in inches.	Depth of Snow in inches.	Ozone in 10ths.	Weather, &c.	Remarks for the Month.
	Highest	Lowest.	Mean.	Max.	Min.	Mean										
	Inches.	Inches.	Inches.													
1	30.200	30.139	30.179	66.1	36.7	52.5	.369	.869	W	152.40	3.6	....	....	1.0		
2	.100	.008	.069	54.6	50.2	51.8	.366	.935	N E	70.10	10.0	6.272	....	2.0	Rain.	Barometer .. Highest, the 1st day, 30.200 inches.
3	.067	.023	.047	67.3	50.8	57.6	.450	.906	N E	91.08	9.6	....	....	2.6		Barometer .. Lowest, the 7th day, 29.269 "
4	.000	29.929	29.968	67.9	47.8	59.9	.462	.893	W	11.52	5.3	....	....	2.0		Barometer .. Monthly Mean, 29·534.
5	29.930	.904	.920	78.2	43.5	61.6	.501	.853	W	31.61	1.3	....	....	1.6	Rain.	Barometer .. Monthly Range, 0·940.
6	.622	.410	.546	56.2	54.0	58.2	.439	.903	W	29.64	10.0	0.076	....	1.6	Rain. [Snow	Thermometer Highest, the 5th day 78·2.
7	.384	.260	.334	69.3	50.0	59.8	.447	.861	S W	59.91	6.6	0.320	....	1.6	Rain — First	Thermometer Lowest, the 29th day, 28·5.
8	.302	.300	.300	43.4	19.1	39.8	.227	.870	N E	267.25	10.0	0.041	Inapp	2.3	Rain.	Thermometer Monthly Mean, 48·24.
9	.491	.462	.475	43.0	29.2	39.1	.217	.852	N E	122.00	9.6	0.497	....	1.6	Rain	Thermometer Monthly Range, 46·60.
10	.514	.479	.491	48.1	36.0	43.0	.256	.868	W by S	221.00	3.3	0.146	....	1.3		Greatest intensity of the Sun's rays, 92°2.
11	.891	.759	.834	53.3	37.6	45.5	.279	.864	W by N	154.35	4.6	...	....	1.6		Lowest point of Terrestrial radiation, 24°0.
12	.793	.649	.715	47.3	33.2	43.1	.270	.919	S W	47.26	10.0	0.046	....	2.0	Rain.	Mean of Humidity, .894.
13	.519	.477	.504	45.2	37.4	42.3	.271	.981	N E	31.52	10.0	0.114	....	2.0	Rain.	Rain fell on 17 days, amounting to 3.794 inches.
14	.413	.301	.312	47.0	38.5	44.0	.297	.985	N E	107.96	10.0	0.210	....	2.3	Rain.	Snow fell on 2 days, amounting to 0.10 inches.
15	.653	.357	.442	48.1	42.4	46.0	.319	.999	N E	192.75	10.0	0.117	....	2.6	Rain.	Most prevalent wind, N. E.
16	.674	.504	.561	46.9	45.2	46.1	.315	.989	N E	64.00	10.0	0.052	....	2.0	Rain.	Least prevalent wind, S. W.
17	.600	.523	.565	46.3	39.7	43.7	.273	.928	W by N	54.60	9.6	0.024	....	2.3	Rain.	Most windy day the 8th day, mean miles per hour, 11.13.
18	.654	.627	.641	52.0	39.7	45.6	.285	.885	W	79.99	5.3	....	....	2.0		Least windy day, the 4th day, mean miles per hour, 0.7.
19	.671	.663	.667	52.2	39.3	45.6	.293	.912	W	47.70	6.0	....	....	1.3	Au. Borealis.	Amount of Evaporation 2.14 inches.
20	.597	.804	.537	49.8	33.1	44.2	.282	.918	W	57.49	7.6	0.018	....	2.0	Rain.	Aurora Borealis, visible on 2 nights.
21	.767	.752	.759	58.1	35.3	46.8	.311	.910	N N W	191.69	2.6	....	....	1.6		
22	.759	.667	.685	54.0	36.4	47.7	.308	.891	W by N	97.60	8.0	Inapp	....	2.0	Rain.	
23	.604	.597	.600	51.0	44.2	48.1	.310	.892	W	97.08	10.0	Inapp	....	1.0	Rain.	
24	.724	.608	.658	58 0	38.7	47.2	.309	.893	N E	110.90	4.6	....	....	1.3	Au. Borealis.	
25	.829	.809	.818	49 7	34.1	44.5	.272	.897	N N E	117.20	8.6	....	....	1.6		
26	.764	.506	.646	61.3	33.2	47.2	.308	.863	N W	185.90	1.3	....	....	1.6		
27	.784	.573	.700	48.0	32.0	41.5	.227	.812	N by W	116.29	8.0	....	....	1.6	Rain.	
28	.369	.279	.325	42.1	33.6	39.0	.229	.900	N E	11.21	10.0	0.420	....	3.0	Rain.—Snow.	
29	.654	.472	.557	49.7	28.5	40.3	.244	.900	W N W	407.42	1.3	0.941	....	3 6		
30	30.000	.724	.841	50.1	34.7	42.1	.243	.857	W	118.22	0.3	....	....	2.0		
31	29.847	.706	.759	50.9	31.2	41.4	.228	.870	S W	225.55	5.0	....	....	1.6		

MORTALITY OF THE CITY OF MONTREAL IN SEPTEMBER, 1864.

Compiled from the Cemetery Returns, by G. E. Fenwick, M.D.

Mount Royal Cemetery.

Disease.	Male.	Female.	Total.	Stillborn.	Under 2 years.	From 2 to 10.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100.	Over 100 years.	Centre Ward.	West Ward.	East Ward.	St. Antoine.	St. Ann.	St. Lawrence.	St. Louis.	St. James.	St. Mary.	Not of Montreal	Native Born.	Foreign.
Still-born	1	2	3	3																		1				3	
Senile Debility	2	1	3									2				1					1			1		3	3
Infantile Debility	3	2	5		5																1	1			1	5	
Small Pox	1	5	6			1															4		1		1	6	
Measles																											
Scarlet Fever	2	2	4		2	1			1											1	3					3	1
Fever	1	1	2		2																1				1	2	
Convulsions																									1	2	
Inflammation of Brain	1		1						1																	1	
Paralysis		2	2									1	1										1		1		2
Croup	1		1		1																1					1	
Hooping Cough	1	1	2			2																		2		2	
Inflammation of lungs	1		1					1												1						1	
Consumption	3	2	5		2	1	1	3	1											1	3		2	2		5	3
Disease of Heart		1	1					1																		1	1
Diphtheria	1		1			1	1																			2	
Inflam. of Bowels	1		1						1																	1	
Disease Liver	1		1									1								1							1
Diarrhœa	2		2		2															2						1	1
Cholera		1	1		1																		1			1	1
Marasmus	1		1			1																				1	1
Accidental		1	1			1																				1	
Not stated	1	1	2				1		1														1			1	2
Childbirth																											
Total	24	28	52	3	23	8	3	5	5		4	1			1		3		1	7	15	6	7	1	11	35	17

Roman Catholic Cemetery.

Disease.	Male.	Female.	Total.	Stillborn.	Under 2 years.	From 2 to 10.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100.	Over 100 years.	Centre Ward.	West Ward.	East Ward.	St. Antoine.	St. Ann.	St. Lawrence.	St. Louis.	St. James.	St. Mary.	Saints Grises.	Not of Montreal	Native Born.	Foreign.
Still-born	6	2	8	8																2		1	2			3	8	
Senile Debility	3	4	7									6	1							1	2		1	1		1	4	3
Infant. Debility	53	46	99		99												1			10	33	1	9	3	7	41	88	10
Small Pox	9	5	14		7	6	1													2	4		1	3		2	12	2
Measles	1	1	2		1	1																		1			2	
Scarlet Fever	9	7	16		2	8															4	1	1	1		2	6	4
Fever	15	19	34		12	15	2	4	1										1	3	3	4	4	5	4	10	26	8
Inflam. Brain	1	1	2			2															1			1			1	1
Paralysis	4		4								3	1								1		2					5	1
Croup	1		1			2																			2		1	1
Hooping Cough		1	1		1																						1	
Inflam. Lungs	4	3	7		2	1	2	1			1									1	1	1		1		2	3	4
Consumption	6	9	15				3	5	3	4											2	7	1	3	1	1	11	4
Disease Heart	3		3						1	1	1						1			1					1		1	2
Asthma		1	1						1																1			1
Inflam. Bowels		2	2						1		1										1		1				2	
Diarrhœa	6	5	11		10	1														2	2			2	1	1	4	7
Dropsy	3	1	4			1				1		2								1	1	1		1			4	
Vermes	1		1		1																						1	
Dentition	13	27	40		36	4													1	5	6	2	10	6	5	5	31	9
Rheumatism	1		1								1						1										1	
Childbirth		3	3					1	1	1										1		1		1			2	1
Cancer	2	1	3							1	1		1								2					1	2	1
Accidental	1		1						1											1							1	
Total	136	139	275	8	169	42	8	12	11	7	6	5	6	1			3		4	29	42	22	31	35	27	42	240	217	58

MORTALITY OF THE CITY OF MONTREAL IN OCTOBER, 1864.

Compiled from the Cemetery Returns, by G. E. Fenwick, M.D.

Mount Royal Cemetery.

Disease.	Male.	Female.	Total.	Still-born.	Under 2 years.	From 2 to 10.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100.	Over 100 years.	Centre Ward.	West Ward.	East Ward.	St. Antoine.	St. Ann.	St. Lawrence.	St. Louis.	St. James.	St. Mary.	Not of Montreal	Native Born.	Foreign.
Still-born	3	1	4	4																1			3			4		
Senile Debility	2	5	7									2	1	1	3					2	1			1		1	6	
Infantile Debility	1		1		1																					1		
Small Pox	1	2	3		1			1		1											1					2	1	
Measles																												
Scarlet Fever	1		1			1																						
Fever		4	4			2	1						1								1						1	3
Convulsions	1		1		1																1				3	1		
Inflammation of Brain	2	1	3		2	1																1				3		
Delirium Tremens	1	1	2							1	1									2				1			2	
Apoplexy	2		2							1	1															1	1	
Paralysis																				2								
Croup		1	1			1													1							1		
Hooping Cough		1	1		1																					1		
Inflammation of Lungs	1	2	3		1							2									1		1			1	3	
Consumption	4	1	5		1		1	1	1		1									1	1		1			2	3	
Disease of Heart	2	1	3				1				1		1							1		1				2	2	
Diphtheria		1	1		1															1						1	1	
Inflam. of Bowels																				1								
Diarrhœa																												
Cholera																												
Disease of Liver																												
Dropsy	1	1	2			1				1																1	2	
Gravel	1		1									1												1			1	
Total	23	22	45	4	9	6	3	2	2	4	3	5	3	1	3			1	1	11	6	4	9	3	1	9	20	25

Roman Catholic Cemetery.

Disease.	Male.	Female.	Total.	Still-born.	Under 2 years.	2 to 10 years.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100.	Over 100 years.	Centre Ward.	West Ward.	East Ward.	St. Antoine.	St. Ann.	St. Lawrence.	St. Louis.	St. James.	St. Mary.	Sœurs Grises.	Not of Montreal	Native Born.	Foreign.
Still-born	6	5	11	11																2	3	1		1		1	11	5
Senile Debility	7	8	15									1	7	5	2			1				4	2				10	5
Infant. Debility	39	42	81		81														1	3	3	2	3	1	3		73	8
Small Pox	6	2	8		2	5	1													2	2	1				51	4	3
Scarlet Fever	5	8	13		3	9	1													1	1	2	3	1			11	2
Fever	3	8	11		1	5	4	1													2	1	1		3		10	1
Inflam. Brain	3		3			3													1					1			2	1
Apoplexy		1	1					1												1				1		1		1
Paralysis	1		1							1														1			1	
Croup	5	1	6			6															1						3	3
Inflamm. Lungs	2	4	6		2	1	1		1	1										1	2						3	3
Consumption	6	13	19			1			6	7	2	3								1	2	2	1		2		9	10
Disease Heart	3	2	5						2		1	1	1							5	3	2	4			1	3	2
Asthma	1		1									1								1	3		1					1
Diphtheria	1	2	3			3																1					3	1
Dentition	5	6	11		11															1			2				2	4
Inflam. Bowels	2		2			1					1									2	4		1	1	3		2	
Diarrhœa	1	1	2			1														1		1					1	1
Disease Liver	1		1				1																1	1			1	
Dropsy	6	7	13		1	2	3			2	2	3						1		2	2	2	1	2		1	6	7
Erysipelas	1		1							1			1									1					1	
Cancer	1	1	2						1			1											1		1		1	1
Childbirth		3	3				1	1	1											2				1			2	1
Accidental	5		5			2	1	2											1				1			3	5	
Total	110	114	224	11	100	36	11	16	11	4	9	7	12	5	2		1	1	2	25	32	21	21	23	28	51	19	174	50