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CANADA

MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

Valedictory Address to the Graduates in Medicine and Surgery McGill University. Delivered on behalf of the Medical Faculty, at the Annual Convocation held in the William Molson Hall of the University, on the 3rd May, 1867. By GEORGE W. CAMPBELL, A. M., M. D., Professor of Surgery, and Dean of the Medical Faculty.

GENTLEMEN GRADUATES :

The connexion which has for so many years existed between us as teachers and students being now about to be for ever severed, it is customary on taking leave of you to address to you a few words of congratulation and advice, but I hope I may be allowed before doing so, to dwell for a short time upon a subject which, although in a measure personal to us as the Faculty of Medicine of McGill University, is not the less interesting and important to you, now commencing life for yourselves, and from your education and position in the community, about to exercise, I hope for the public weal, no inconsiderable influence upon public opinion.

You are most of you, no doubt aware, that since 1st of January, 1866, the Profession in Upper Canada has been governed by an Act, entitled "An Act to regulate the qualifications of Practitioners in Medicine and Surgery in Upper Canada," and that under this Act a council has been established, composed partly of representatives chosen, one from each of the four Universities : one from the Toronto School of Medicine, and one from each of the twelve Electoral Divisions of Upper Canada. The body so selected, is styled the General Council of Medical Education and Registration of Upper Canada. To this Act, as at first passed, the McGill College authorities offered no opposition, it was regarded by them as a very excellent measure ; liberal in its provision, and a just and sufficient protection to the properly qualified Medical Practitioner. By it, Licentiates of Medicine in Upper and Lower Canada, and persons holding medical or Surgical Degrees or Diplomas from any University in Her Ma-

jesty's dominions, were entitled to registration. Now, this very excellent Act, framed upon the present English Medical Bill, was formed not quite to suit the exclusive views of the President of the Medical Council, and an Act to amend it was endeavored to be forced through the last Session of Provincial parliament, the 2nd clause of which reads as follows:—

2. Every person claiming to be registered under the said Act, as being qualified under the third paragraph of Schedule A, thereto appended, and who had not regularly attended lectures in some medical college or school, before the 1st day of May, one thousand eight hundred and sixty-six, must pass through the matriculation examination, and complete the *curriculum* prescribed by the general Council of Medical Education and Registration of Upper Canada, hereinafter referred to as "The Council," before he shall be registered under the said Act; and he shall pass such examination at the *time* and in the *manner* directed by the Council.

It is evident that if this had become the law, even though we had agreed to conform to the Matriculation examination required by the Medical Council for Upper Canada, none of the holders of our Degrees could practice in that Province until they had submitted to a re-examination in the manner directed by the Council, and the injustice of this will be most evident, when it is remembered that British Degrees and Diplomas with qualifications, Literary and Professional, no higher than our own, are exempted from the operation of this Act. Besides this, the Medical council of Great Britain has never attempted to take the Matriculation examination out of the hands of the Universities, Colleges of Physicians and Surgeons, and other Licensing Corporations, but has merely insisted that the standard recommended by them, should be adopted as a minimum for the examination. They have no special Examiner of their own, nor do they attempt to conduct such examination under their own supervision, having perfect reliance in the honor of the universities and colleges, that these examinations will be conducted impartially and honestly.

The opposition made by our Faculty to this most unjust measure, which resulted in the adoption by the House of the present Amended Act, has brought out most strongly the President of the Medical Council of Upper Canada. In a circular addressed to the Members of the Council, after stating that, "It is to be deplored that a Lower Canada Institution, like McGill College, should oppose the Medical Council and Profession of Upper Canada, in their praiseworthy efforts to elevate the standard of Medical Education." He goes on to state, "The report of the Committee was to have been based on a compromise which was effected in the committee room between the then Members of the Upper Canada Medical

Council, and the two Professors of McGill College who were present. The third section of the 2nd paragraph of the Amended Bill as reported, formed no part, however, of any such compromise. It is so unjust, that if it had been written in *extenso* before the Committee rose, I do not think it would form part of the Act to day; and the Council will, I am convinced, at their next meeting, adopt the proper expedient to render it null and void." Now this section thus insinuated to have been clandestinely smuggled into the Bill by McGill influence, reads thus:—

The certificate of any University or incorporated Medical School in Lower Canada that any student thereof has duly passed such matriculation or preliminary examination shall be evidence thereof.

As you see it merely gives Lower Canada Colleges the privilege of examining their own students, according to the standard of Matriculation established under the Act, which is the same as that recommended in June last, by the Council of Medical Education and Registration of Great Britain, the requirements of which are as follows:—

"Compulsory, English language, including grammar and composition; Arithmetic, including vulgar and decimal fractions; Algebra, including simple equations; Geometry, first two books of Euclid; Latin translation and grammar; and of the following optional subjects: Greek, French, German, Natural philosophy, including mechanics, hydrostatics, and pneumatics.

"After 1869, Greek will be one of the compulsory subjects.

But the President of the Council has not yet done with the Medical Faculty of McGill, his pet measure having been thwarted as therein shewn; in his introductory lecture delivered at the opening of the new Medical School in Kingston, in October last, we are spoken of in the following complimentary terms:—

"As the matriculation or preliminary examination must be passed before the students can enter any Medical College, it is not necessary that the examiner should know where they intend to prosecute their medical studies, so that the factious opposition which a certain College has raised to those examinations, under the plea that their students would not be fairly dealt with, has no foundation on which to rest, and I fear that the public will be uncharitable enough to suspect that their opposition was not undertaken in the interests of the students, nor in the interests of science, but merely because the Professor of that College dreaded that the regulations of the Council would have thinned their classes by diminishing the number of students and that consequently the revenue which they derive from the manufacture and sale of Degrees would be wonderfully curtailed."

"We deprecate such conduct; we deeply deplore that men actuated by such motives should have found their way into the ranks of our profession, and more so still that they should have been entrusted with professional functions, as we must naturally infer that they will be far more anxiously exercised about the quantities rather than the qualities of those they will let loose to prey on the public."

I am really ashamed to notice such an unjust and ungentlemanly attack upon this Faculty, and it is his position alone as President of the Medical Council, and not the man that is entitled to any notice or consideration in this place. It has long been the aim of this Faculty, to elevate as far as the circumstances of the country would permit, the standard of general education in its students, in proof of this I have only to refer to the following extract from an address to the Graduating class, delivered by me on a similar occasion to the present, eight years ago. I then said:—

"I would urge upon parents and guardians, who intend to educate their sons for any of the learned professions, not to be in any hurry fixing their choice before the mental powers have had time to develop themselves, and the tastes have in some degree been decidedly displayed. The employment to which the whole subsequent life is to be dedicated, which is to be its business, and should as much as possible be its pleasure, should not be decided upon, when the judgment is immature, and the higher mental capabilities are only beginning to manifest themselves. I believe that a course of education that will qualify a youth to commence with advantage the special study of any of the professions, should be followed up, at least, to the age of eighteen, the mind will then have had time to unfold itself, and its power will be readily directed with full intensity, to the special profession, the heart as well as the head being engaged in its pursuit."

"A good knowledge of classics is universally acknowledged to be an essential part of the general training necessary, before entering upon the study of Medicine; without such knowledge, the very meaning of the terms constantly employed in medical literature would be incomprehensible to the student, but the chief importance of a classical education consists in this, that experience has proved the labor bestowed in its acquisition, to be by far the best discipline for preparing the intellect, for being advantageously employed upon any other subject. An acquaintance with the physical sciences is now considered an essential part of a preliminary Medical Education, and to the understanding the more exact among them, as Mechanics and Astronomy, a certain amount of Mathematics is necessary. Some knowledge of Zoology, Botany, Geology, and

Mineralogy, is now regarded as essential to any well informed, and liberally educated Medical Man, and Chemistry might, with great advantage, be studied as an elementary Branch. It may be thought that the range of study, now suggested, is too extensive for the generality of medical students, but for my part, if circumstances permitted, I would feel disposed to add to it, the study of Logic and Metaphysics; the exercises in composition usually combined with the instructions on those themes, are most reliable in the formation of habits of thought, as well as in the acquirements of power and facility of expression. I am convinced that a youth thus prepared, having the advantage of a large amount of applicable knowledge, will commence the study of Medicine, with the probability of much greater ultimate success than he who has not had such a thorough preliminary training."

Five and twenty years ago, this Faculty adopted its present extended curriculum of Professional Studies; impressed with the necessity of the Medical student being thoroughly grounded in both departments of his profession, it adopted the rule of an equal attendance, and an equally strict examination both in Medicine and Surgery, and the title of its degree, Doctor of Medicine and Master in Surgery, is now in accordance with this double curriculum, and examination. I have to apologise to you Gentlemen and to this Meeting for having occupied so much time in defending our faculty from the unfounded accusations which have been made against it. No Gentlemen, it is not the want of Education in the McGill Graduates that has caused this outburst of boisterous indignation on the part of the President of the Council of Medical Education, I fear the motive must be sought for in the high position which our Graduates occupy, and the success with which they have honestly and honorably carried, throughout the length and breadth of Upper Canada, and in the jealousy of a small school, against a larger and more successful competitor; for be it remembered, that the Presidency of the Medical Council, and of the Medical School in Kingston are held by the same individual, and this is where the shoe pinches, the number of the Upper Canadian Students who, blind to the merits of Kingston and its Royal College of Physicians and Surgeons, give it the go by from year to year, to attend our Lectures, and who we hope we send back to their homes wiser and better men.

Gentlemen, it is a matter of serious import to you all, not to permit this abuse of power on the part of the Medical council, having now finished your own pupilage, such of you as now settle in Upper Canada must see to it, that the future Medical student gets fair play, and that the President of the the Medical Council is not permitted to smuggle through the Local Legislature prohibitory enactments, not for the benefit

of the Public nor of the Profession, but with the view to compel the Upper Canadian Medical Student to pursue his professional studies in that Province, thus excluding wholesome opposition both in the teaching and practice of Medicine.

And now, Gentlemen, we hope that during the years you have spent with us as your teachers, our labors have not been in vain, but that we have been able to communicate to you that knowledge which we have acquired upon the various subjects on which we lecture, we hope you have profited by these instructions, and that you will find the information thus obtained, of good service to you in your future professional career; but let me remind you that though now, Medical Practitioners, you should still be students. In no profession do men rise to eminence who have not gone through a severe course of study, it is the cultivation of the mind alone which elevates to distinction, the road to it is along the path of honest industry, the crowned Monarch no more than the humble student has discerned no other. I have seen something of medical practice in my time, and I have never yet known any one rise to eminence unless by close, constant and unremitting exertion. In the practice of medicine these qualities should hold preeminence. No man devoid of them should be allowed to prescribe for the sick, to hold as it were the strings of life in his hands; the hard-working meritorious practitioner will most assuredly rise to competence and fame, while the idle, dissipated, and ignorant, will receive their justly merited neglect and contempt. The relief of the sick poor is a duty which usually falls to the lot of those commencing their professional career, it has ever been diligently performed by the conscientious Practitioner, but it should be performed from an active principle of humanity, rather than to gain applause. The poor man bowed down by disease, has a large claim upon the sympathy of his physician; kindness, tenderness, and gentleness should ever accompany the administration of relief in such cases, and here, most assuredly, if anywhere, he may become a social reformer in the highest sense of the term, in combating degrading habits, and injurious customs. Epidemics may be prevented, or even extinguished by applying the principles of hygiene to the abatement of the evils which produce them, and promote their diffusion, such as defective ventilation, exclusion of light, neglect of cleanliness, and imperfect domestic sewerage. I might enlarge upon the duties of the physician in society at greater length, but time fails, let me only add a few words in conclusion, upon your duties to your professional brethren, and here frequently the temptation is great, under a pretence of love of humanity, and of scientific truth, to depreciate the skill and ability of a rival, or to seize upon a real mistake, and upon the

erect your own character for superior ability. This ungenerous form of criticism, is still I fear far too common, and frequently in smaller towns and villages, where more is to be directly gained by depreciating an opponent, it embitters all the relations of life. "Do unto others as ye would they should do unto you," this only can be the foundation, alike of Medical ethics and Medical etiquette. Much, no doubt, may be obtained by suavity of demeanor, and gentlemanly training, associations, but the only true and universally safe guide, is the principle thus announced; with such a guide the Medical man will become no boasting depreciator of his brethren, no vulgar quack, no pilferer of the merits or reputation of his competitors, remembering the *cauté casté et probé* of his graduation oath, he will avoid the contact of the vulgar and the ignoble, and will shun everything that weakens spiritual power, as drunkenness, idleness, sensuality, and pride. And now Gentlemen, farewell, go forth on your noble mission, let it be your high and honourable aim to assuage human suffering in all its various aggravations, and in imitation of your Great Master "to heal all manner of diseases," and may "the blessing of him who was ready to perish come upon you."

Lectures on the Diseases of the Eye, recently delivered before the Ophthalmic Class of the Toronto School of Medicine, and the Ophthalmic Class of the Medical Department of the University of Victoria College. By A. M. ROSEBRUGH, M.D.

LECTURE III.—CONVERGENT STRABISMUS.

STRABISMUS is that well known deformity called squint or cross-eye, when the person afflicted is unable to direct the axes of both eyes simultaneously to the same point. When one eye is directed to an object immediately in front (the cornea occupying a central position), the other eye is directed either to the right or to the left of that object, and the cornea is turned either towards the outer or the inner corner of the eye. When the cornea of one or both eyes is turned unduly towards the inner corner of the eye, it is called *Convergent Strabismus*; when towards the outer corner, *Divergent Strabismus*.

Deviations of the eye in a vertical or oblique direction are very rarely seen, and do not demand special attention.

It is a remarkable fact that, although no affection of the eyes has attracted more notice than squint, it was not until the year 1839 that Dieffenbach performed the first successful operation for its relief. Dieffenbach operated by dividing the rectus muscle,—an operation so apparently simple that it at once became very popular,—general practi-

tioners operated upon their "cross-eyed" patients, and thousands of cases were thus treated. Many of these were doubtless successful; but it was soon found that a large number of the cases of squint returned, and many that had a convergent squint before the operation had a divergent squint afterwards. The operation, therefore, in a comparatively short time, fell into disrepute, and was little heard of until very recently. This arose partly from want of proper laws to guide the operator, but more particularly from the fact that the pathology of the affection was not known.

Within the past few years, however, much attention has been given to this subject, and we have now the satisfaction of knowing that in no part of ophthalmic surgery have greater advances been made of late than in the study of the pathology of the muscles of the eye. This is due chiefly to the labours of Prof. Von Graefè, of Berlin.

Closely following the publication of Von Graefè's papers, Professor Donders, of Utrecht, gave the world his great work on the defects of the refraction of the eye, and their relation to strabismus, in which is given to us for the first time the true pathology of strabismus.

The translation of Professor Donders' treatise on "The Anomalies of Accommodation and Refraction" was published in 1864, by the New Sydenham Society, and occupies the not very moderate space of 635 pages of the 22nd volume.

In these skilful researches in physiological and pathological optics, Donders brought to bear the application of the higher mathematics, and with mathematical precision he determined the existence and treatment of myopia, hypermetropia, and astigmatism, as well as the diseases which arise from these optical defects of the eye, viz: asthenopia and strabismus. These important discoveries of Donders are completely revolutionizing the treatment of these diseases, and have contributed not a little to the elevation of ophthalmic medicine and surgery.

Professor Donders was the first to give a complete description of hypermetropia; he pointed out how very common this affection is, and demonstrated that nearly all cases of *convergent strabismus* and *asthenopia* depend upon this optical defect of the eye. Donders was also the first to demonstrate the no less important fact that *divergent strabismus* is most frequently the result of myopia.

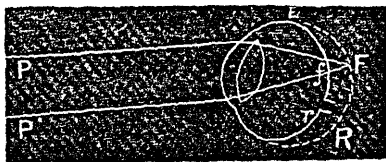
During Professor Donders' researches, he registered over two hundred and eighty cases of strabismus, and took accurate notes of every circumstance in each case that appeared to be either a cause or a consequence of the squint.

Most ophthalmic surgeons of eminence in Germany, France, England,

and the United States, following Donders' example, have worked these problems out for themselves, and with uniformly the same satisfactory result.

It having been satisfactorily demonstrated that, as a rule, hypermetropia exists in all cases of convergent strabismus, we can hence infer that the hypermetropia is the cause of the squint. In support of this view we have the following facts:—Hypermetropia is to a great extent inherited, and can be demonstrated in the infant. If the hypermetropia be corrected when the squint is incipient, the squint disappears. If then hypermetropia is the cause of the squint, the next question is, How is this brought about?

According to Donders, hypermetropia depends, as a rule, upon the shortening of the antero-posterior diameter of the eye. The cornea and lens have usually the normal degree of curvature, but the distance between the lens and the retina is too short. Parallel rays of light falling upon the normal eye are brought to a focus *on* the retina; but when parallel rays fall upon the hypermetropic eye, they are brought to a focus *behind* the retina.



Thus in Fig I, *E* represents a section of a hypermetropic eye; parallel rays *PP* falling upon *E*, do not meet in a focus on the retina *r*, but pass to *F*—a point on the dotted line *R*, which represents the position of the retina in the normal eye.

When the normal eye is in a state of rest, and directed to a distant object, the image of the latter is formed on the retina, without any effort of the "accommodation" of the eye. When the hypermetropic eye, however, is directed to a distant object, that object can be seen with distinctness only by an effort of the "accommodation."

Again, we know that when both eyes are directed to a near object, they are very much converged; the optic axes cross at the point to which they are directed. If one eye be covered, and the opposite eye be accommodated for its "near point" (the nearest point of distinct vision), the covered eye will be found to be very decidedly converged towards the nose—to have, in fact a temporary convergent squint. This arises from the constant association of the act of accommodating the eye for short distances with the act of contracting the internal rectus muscle. Hyper-

metropic persons, however, being obliged to exert the accommodation of their eyes even in looking at distant objects, it is easy to understand that they would be inclined to contract their internal recti muscles unduly, so as to increase their power of "accommodation." This excessive contraction of the internal recti muscles converges the eyes to a point nearer the eyes than the object under observation, and causes one of the eyes to turn in. When, therefore, they wish to see distinctly with one eye, they instinctively turn in the other.

Out of one hundred and seventy-two cases of convergent strabismus examined by Donders, one hundred and thirty-three were the result of hypermetropia, thus giving seventy-seven per cent. of the cases. Donders is convinced that if all the cases of convergent strabismus that occur in a given population were examined, it would be found that a much larger percentage of the cases are caused by hypermetropia. In the first place, the cases where the convergence is but slight, do not generally apply to the ophthalmic surgeon, and yet these are precisely the cases in which the hypermetropia is the sole cause of the squint. Again, the cases of convergent strabismus that *do* come under observation or treatment, are usually exceptional ones—many of them arising from inflammation, paralysis, &c.

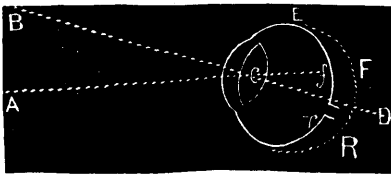
It having been proved by Donders that hypermetropia is a very widely diffused optical defect (he thinks even more widely diffused than myopia), and as the cases of convergent strabismus are not of very frequent occurrence, it follows that hypermetropia very frequently exists without causing squint. This arises from the great aversion which all persons have to double vision. When hypermetropic persons tax all their powers of accommodation to enable them to see an object distinctly, they instinctively contract the internal recti muscles; this causes one of the eyes to converge, and they see objects double; but as all persons have a strong, almost irresistible "clinging" to single binocular vision, they refrain from exerting the focal adjusting power of their eyes unduly, and in this way avoid double vision and convergent strabismus. This instinctive "clinging" to single vision with two eyes can be very simply demonstrated with a weak prismatic glass. If we place before one of our eyes a weak prismatic glass, with the base turned outwards, and look at an object with both eyes, the object will at first appear double; but almost immediately that eye involuntarily turns inwards, so as to cause a very decided temporary squint, for the purpose of seeing the object single. This is the circumstance then that prevents most hypermetropic persons from having convergent strabismus.

The question here naturally arises, what circumstances co-operate to produce convergent strabismus in persons who are hypermetropic? These are divided by Donders into two parts:—1st. Those which diminish the value of binocular vision; 2nd. Those which facilitate convergence of the eyes.

First Division.—Those which diminish the value of binocular vision. These are spots on the cornea, amblyopia or insensibility of the retina, astigmatism, &c. Spots on the cornea were formerly considered to be a direct cause of squint; but it has now been proven that these opacities tend to develop convergent strabismus in those cases only in which the person is also hypermetropic. The haziness of the cornea impairs the vision of that eye so that it can contribute very little towards binocular vision; and, on the other hand, when that eye converges, the impression made upon the retina is less distinct, and consequently double vision is less annoying.

Second Division.—Convergent strabismus is liable to be produced in cases of hypermetropia, if there are also circumstances that facilitate convergence of the eyes. Many persons can with ease converge the eyes simultaneously to an object brought within two inches of the root of the nose. Children are said to contract a permanent squint by imitating others who are affected with this deformity; but this can only take place if the child is hypermetropic.

Again, in hypermetropic eyes, the yellow spot of Sommering (or point of acute vision) is usually displaced outwards; this necessitates a slight deviation of the eyes outwards, that the object looked at may make an impression on the yellow spot of each eye, and preserve binocular vision.



Thus, in Fig. 2, E. represents a horizontal section of a Hypermetropic eye. The line B c D represents the axis of the cornea, and the line A c F,—the line of vision. The point where the line A c f touches the retina corresponds with the position of the *macula lutea* or yellow spot, which is represented to be considerably external to its normal position. In order that the image of A may fall upon the yellow spot, it is necessary that the axis of the cornea shall be turned towards B. This gives the

eye an apparent degree of divergence which is measured by the angle BcA .*

Such persons can maintain binocular vision with great difficulty, as the necessary divergence is not very easily effected. In the experiment with the prism just referred to, the base is turned outwards, and applied to one of the eyes—both being open; in that case we at first see double, but almost immediately we involuntarily turn the eye towards the nose, so as to obtain binocular vision. If the reverse experiment be tried, turning the base of the prism towards the nose, it will be found that very few persons can diverge the eyes sufficiently to enable them to see single, all objects will consequently appear double. This displacement of the yellow spot outwards would tend to produce convergent strabismus in normal eyes; but much more so in the eyes that are hypermetropic.

Convergent strabismus from hypermetropia usually shows itself about the fifth year; probably because the child commences about that age to use the eyes more particularly upon minute and near objects.

Convulsions, difficult dentition, worms, blows on the eye, irritation, &c., &c., are among the causes most commonly assigned as the origin of squint by the older authorities on eye diseases. McKenzie, in his treatise on the diseases of the eye, gives a long list of circumstances that he regards as causes of squint, such as fits of passion, fright, children looking at the point of their noses, &c., &c. Dr. Haynes Walton, however, in the second edition of his treatise on the surgical diseases of the eye (1861) candidly admits that "in the majority of cases the squint really cannot be accounted for, as it occurs in the healthiest of children."

In a case of convergent strabismus that is now under my observation, the squint was attributed by the parents to whooping-cough; upon examination, however, I found that the eyes were hypermetropic to the extent one-twelfth, and that there was partial insensibility of the retina of the deviated eye. The little patient is about seven years of age, and the squint had first shown itself about two years ago.

*By means of an instrument called the *Ophthalmometer*, it has been discovered recently that, even in the normal eye, the axis of the cornea and the axis or line of vision do not correspond; they are very nearly on the same horizontal plane but the axis of vision cuts the cornea between the centre and the nasal side. The amount of this deviation in the normal eye (the value of the angle BcA) was found by Donders to be from 3° to 7° , and in the hypermetropic eye he found the divergence to amount to from 0° to 9° . A divergence of 9° in each eye would amount to 18° for the two eyes; such an amount of divergence would give the person a very decided *apparent* strabismus.

Convergent strabismus, at first, is usually periodic—that is, it shows itself occasionally only; this takes place when the eyes are fixed critically upon a minute object requiring accurate focal adjustment to see it distinctly. If the hypermetropia be relieved when the convergence first makes its appearance, the development of the squint will be prevented. If, however, this precaution be not taken, the squint will finally become habitual.

When the strabismus has become habitual, it is found that both internal recti muscles are somewhat shortened. Both muscles become shortened from the habit which these persons acquire of bringing the object under examination to the side of the affected eye, so that the internal rectus of the eye less affected is kept more or less contracted. Upon examining with the microscope the external and internal recti muscles of a person with strabismus from hypermetropia, no change in structure can be detected.

LONDON CORRESPONDENCE.

The cry is, they come, they come! Who comes? Why the countless multitudes whose tegumentary coverings are in a state of affliction. "My dear," says Mrs. Gamp to her husband, "how alarmingly frequent must be those horrid epidemics of diseases of the skin, for they are building hospitals everywhere to receive the poor sufferers." Mrs Gamp is not the only one who forms such an opinion, for the advertisements in the public journals would lead the public to suppose that London is the great centre where all the cutaneous maladies of Europe assembled to be treated. Formerly London was satisfied with the single hospital for skin disease in New Bridge Street, Blackfriars. At Guy's and University College Hospitals, special departments have been established for many years, in connection with the skin, and every visitor to the Museum of Guy's must remember the magnificent series of models in wax, illustrating every known cutaneous malady under the sun. Within the last few years, owing to the rage for specialism, these were not considered enough, and St. John's Hospital for skin diseases was established in Westminster by Mr. Milton, which has lately been removed to Leicester Square. Mr. Hunt's Dispensary for skin diseases in Duke Street, Manchester Square, has been known for some time, and Mr. Hunt himself is a skilful dermatologist. Another Dispensary exists in Marlborough Street, and still another has just been established in Farringdon Street, under the management of Dr. Ross. A national Institution for diseases of the skin

flourishes in Mitre Street, Aldgate; and a City Hospital for the same class of diseases, has been founded in the City Road. There may be probably several others. Simultaneously with the origin of these various institutions, appear works on cutaneous pathology, many of the authors, no doubt having acquired their experience beforehand theoretically. It were a farce to adopt a specialism without being associated with a special institution, and as all the dermatologists cannot be admitted into St. John's or some other Hospital as medical officers, they institute dispensaries for their own benefit, Ah! I mean of course for the benefit of the suffering poor. The resident out of London can now understand why "King Skin" is reigning just now. Waiting, upon the principle of German Unity, the various skin divisional kingdoms are now centred in the metropolis. A special journal has been started exclusively devoted to skin diseases, supported by a chosen band of workers. The titles of the various works on the skin are curious in their way; besides some good manuals and treatises, we have Barr Meadows on "Eruptions, their real nature," and another work on "Obstinate affections of the Skin," implying that in the former the nature of skin disease has not been heretofore understood, and in the latter obstinacy only has to be overcome to effect a cure.

The skin is an example of other parts of the body being chosen by the few or many to work upon and make a living, but it is a grand mistake to suppose that the same specialty will support a large number of followers. The public are fond of novelty, and those who suffer from chronic maladies, will consult every new name that appears in the advertising columns of the *Times*. It is rumoured that a dispensary is about to be formed for "*diseases of the spleen*," that organ having experienced an amount of neglect that is unmerited. In fact the spleen has had the uppermost lately in the discussion before a well known society which expelled one of its fellows. Some of the speakers were splenic.

Apropos of that, opinion is divided upon the propriety of such a step, but the subject is an unpleasant one at best, and the least said about it the better.

The College of Physicians have just elected Dr. Alderson, Physician to St. Mary's Hospital, for their new President, Sir Thomas Watson having intimated his desire not to be re-elected. Dr. Alderson is one of the oldest fellows of the college and is highly respected. In the last list of licenciates of the college are the names of graduates of several of the Canadian Colleges. This looks well.

The profession in Canada may feel interested to know that the chair of anatomy in the University of Edinburgh, vacant by the death of Goodsir

has been filled by the election of Dr. William Turner, who had six out of seven votes. He is a gentleman, well known for his scientific attainments, and is highly popular among the students. He possesses the happy disposition of making everybody his friend. When the British Association for the advancement of science met at Birmingham in 1865, Professor Turner, Professor R. P. Howard of Montreal, Dr. Gibb of London, and Mr. Alfred Wallace the well known traveller, resided together during the meeting. The writer has heard Professor Turner remark, that he found that most of the Medical Students from Canada, in Edinburgh, possessed a degree in arts, showing the liberal education they had attained before coming to Europe.

The meeting of the British Association will be held this year at Dundee, and as it is our intention to be present, your readers may reckon upon a letter from that bonny place. What with the Dundee meeting in September, the meeting of the British medical Association at Dublin in August, and the Paris Exhibition now open, one will be fully occupied. It will be difficult for many to attend all three.

William Lawrence, the Doyen of the surgical faculty in London, has been made a baronet. Considering his age, and retirement from active practice, it has astonished many persons, more particularly because he refused the honour some thirty years ago. We should not be surprised to see many more similar creations during the next few years, as so many medical men, are attached to the court. At this moment we have the names of Watson, Locock, Holland, Ferguson and Lawrence in London alone.

Various rumours are current regarding the condition of the Princess of Wales, whose malady is spoken of as strumous disease of the knee joint, the result of an injury at Sandringham, before her confinement.

London, April 16th, 1867.

REVIEWS AND NOTICES OF BOOKS.

On the Action of Medicines in the System. By FREDRICK WILLIAM HEADLAND, M.D., B.A., F.L.S., Fellow of the Royal College of Physicians, &c., &c. Fifth American, from the fourth London Edition, Revised and Enlarged, 8vo., p.p. 431. Philadelphia: Lindsay & Blakiston. 1867.

This work was the prize essay for the Fothergillian gold medal awarded by the Medical Society of London in 1852, and is, as its title im-

plies, an American reprint of the fourth London edition, which was issued from the English press, late during the past year. Considerable and valuable additions have been embodied without enlarging the work to an inconvenient size. The labours and researches of therapeutists of all nations during the past seven years, those at least of material importance, have been noted.

The work consists of four chapters, the first of which is devoted to introductory remarks. In the second chapter are considered, some of the more important classifications of medicines together with the opinion of authors respecting their action.

In chapter third we find the general mode of action of therapeutic agents, introduced into the stomach, treated of in ten propositions; and in the fourth chapter is considered the action of some of the more important medicines.

The views set forth on the action of medicine are at once scientific and demonstrative, there will be found no idle speculation. What is advanced is so on grounds which are incontrovertible. The experiments and inferences are clear and satisfactory. In speaking of strychnine the author observes;

“ Strychnia is thus an exciter of muscular contraction and of motion; exalting sensation in a less degree. That it operates by an action on nerve, and not on muscle directly, has been proved by the experiments of Matteucci. It has also apparently some action on a part of the ganglionic system of nerves, by which it is enabled to promote the function of the stomach, and becomes temporarily a tonic when given in relaxed conditions of that organ. But it does not excite the action of the heart.

“ In cases of poisoning by *Nux Vomica*, the brain and the heart are unaffected. Tetanic and general convulsions are produced; and the immediate cause of death is a spasm of the muscles of respiration.

“ Dr. Taylor has very clearly laid down the distinctions between the kind of Tetanus which is produced by Strychnia, and that which is the result of disease. The symptoms are sudden and violent, nearly all the voluntary muscles are affected simultaneously. Opisthotonos occurs early. The symptoms go on to death, or the man recovers completely. They seldom last for more than two hours. Idiopathic Tetanus, on the other hand, is gradual, commencing with spasm of the jaw; opisthotonos comes on later; the affection may last for days, or even weeks. (*Guy's Hospital Reports*, vol ii., 1856.)

“ In treating of this subject, some confusion has arisen from the use of the word *intermission*. There is in neither case a positive intermis-

sion or cessation of symptoms, though in both they may be paroxysmal. The apparent intermission in poisoning-cases is caused simply by the effects of one dose having gone off, and fresh symptoms being subsequently produced by another dose.

“ It has been supposed that the poisonous alkaloid may become destroyed while in the blood (Taylor). I do not think we have any sufficient ground for assuming this. I think Mr. Horsley has shown that the Strychnia may sometimes escape detection in cases of poisoning by reason of its power of entering into a firm combination with Albumen, from which it cannot even be separated by an acid menstruum. Strychnine is also rapidly eliminated in the secretion of urine, and as it thus passes out of the system, its action goes off and disappears. As opposed to the theory of the decomposition of Strychnia in the system, it may be mentioned that the flesh of animals poisoned by Strychnia is poisonous.”

This opinion of Dr. Taylor has been called in questions by other chemists of equal standing as himself, and we may regard the assertion that Strychnine may become destroyed while in the blood as unfounded and unproven. Dr. Taylor failed to prove the presence of strychnine in the body of Cooke, poisoned by Palmer, but we do believe, and we did at the time believe that his premises of reasoning were from insufficient data. We would call the attention of our readers to the recent case of poisoning by strychnine, which formed the subject of judicial inquiry, the particulars of which we publish in this number of the journal. The crown secured the service of Dr. Girdwood of this city who most perfectly and conclusively demonstrated the presence of strychnine in the body of deceased, indeed in another case which has been submitted to a jury for their decision, Dr. Girdwood demonstrated unmistakably by the colour test the presence of strychnine not only in the stomach and its contents, but in the muscles of the thigh, and also in the thigh bone, we were ourselves present during part of the chemical investigations in this case and were convinced of their correctness. So that the theory of Taylor that strychnine becomes destroyed in the blood falls to the ground. This assertion was advanced by him at the Palmer trial, and was objected to at the time by Drs. Rodgers and Girdwood, Dr. Leatheby, Mr. Nunnely and others, (see *London Lancet*, vol. i, 1856.). Dr. Taylor seems to have arrived at his conclusion simply from the fact that his process of chemical investigation was defective, and hence he started a theory unfounded on fact; the only fact being his inability to discover the presence of the poison which in other hands would have been undoubtedly demonstrated. The work before us is replete with interest, written by a master hand in that pure yet simple style of the lover of scientific

research seeking after truth, we commend it to our readers as a book to be read and studied, and whose teachings will be with advantage taken to the bed side to aid us in carrying out that privilege given to us from on high to relieve the afflicted and succour the distressed.

PERISCOPIC DEPARTMENT.

Physiology.

THE ACTION OF ARSENIOS ACID ON THE ANIMAL ORGANISM.

By CUNZE, of Helmstadt.

The eating of arsenic in Salzburg and Steiromark, so often mentioned and denied, has recently, by numerous credible observers, been proved. Its beneficial action on animals, and above all on horses, has already long ago, attracted the attention of medical men; but no one could give a satisfactory solution of the question as to the manner in which it acted.

Mr. Cunze, who has made his observations under the direction of Prof. G. Musenier, in the Physiological Institute at Gottingen, says that arsenic is not used in that part of the country as an article of enjoyment as tobacco, nor as a medicine; but according to the statements of persons who use it, as an agent enabling them to endure fatigue and labor, though the amount of food taken is not increased. According to Cunze, when arsenic is taken, the materials for the transformation of the tissues are sparingly used, and the endurance of the body augmented.

The observations of Kopp, who, without change of food or mode of living, increased twenty pounds in weight in two months, while working in an atmosphere containing arsenic; but being removed came back to his original weight in two weeks. As, also, the observations made on horses, make it probable that by taking arsenic without increase of bodily labor, the weight of the body will be increased.

According to Roussin (*Journal de Pharm. et Chirurgie*, T. 43) two kittens, whose mother was fed with arseniate of lime, and afterwards they themselves with the same substance, got immensely fat, but became very quickly poor when the arsenic was taken from them. Schmidt and Hurzwage observed in birds and cats fed on arsenic, a decrease of the carbonic acid in the breath, and in the last named animals a decrease in the urea. According to Schmidt no decrease in the weight of a cat was per-

ceived, which was fed for several days on arsenic, though no other food was taken. When the arsenic was stopped it lost weight rapidly. It seems therefore that a saving of the material used in the transformation of tissue occurs, by checking the process of oxydation. This checking process can only occur at the expense of another function, namely, absorption. To prove his opinion, Mr. Cunze made daily subcutaneous injections on a rabbit, containing arseniate of soda, increasing it from two to eleven m'gram, and observed the change of temperature. The normal temperature of the ear, which in the first four days was between $30^{\circ} 4$ R. and 31° R., came down finally to 29° R. The experiment was then stopped; an eruption on the skin and diarrhœa supervening.

Arseniate of soda was given in the food of another rabbit. The dose was increased from one m'gram to four in eleven days; no arsenic was then given for a few days, and finally the dose of arsenic was increased to fifteen m'gram. These large doses brought on diarrhœa. During the time the animal brought forth young. The temperature of the ear varied before arsenic was given, between 31° and $31^{\circ}.8$, average $31^{\circ}.4$ R. In the first period of gestation no visible decrease of temperature was observed, but after gestation, showed very plainly. The temperature went down in a few days, during which time four m'gram were given, to 29.6 R. (formerly the average was $31.$) and remained constantly, with the exception of one day, 30° or below 30° . One day after the arsenic was discontinued, the temperature went up to $31^{\circ} 5'$, and remained so the next day, when no arsenic was given. The two following days, eight to nine m'grams of arsenic were given in the morning, and on the first day the temperature fell to $28^{\circ} 2'$; on the second day to 28° ; during two subsequent days it remained between $27^{\circ} 4'$ and $27^{\circ} 3'$, increased then to $29^{\circ} 3'$, but came down again, when arsenic was repeated, to $27^{\circ} 4'$ and $27^{\circ} 3'$. The researches made in regard to weight did not give distinct results. The observations of the author, made on the hearts of animals treated with arsenic, are very interesting. In several cases in which the poison was brought directly into the vascular system, a remarkably long continuation of the contractions of the right side of the heart showed itself after death.

He observed, after injecting ten m'gram of arsenious acid in the jugular vein of a rabbit, and killing it a few minutes afterwards, a continuation of the pulsations of the right ventricle and auricle thirty times in a minute, in the beginning; changing afterwards, the auricle pulsating at 80, the ventricle only forty. Two hours after death the movements of the right ventricle ceased, the auricle still making eighty pulsations. The auricle continued to pulsate twenty hours after death—in this propor-

tion : after three hours, sixty-seven times ; after six hours, twenty-seven ; nine and a half hours, twenty-five ; eleven and a half hours, eighteen. After twenty-two hours, the pulsation ceased entirely. Other experiments, made in a similar way, gave the same result, namely, a continuation of the pulsations of the right auricle principally, after life had ceased. Comparative experiments made with rabbits which were not poisoned, never gave a similar result.

The quantity of arsenic which reaches the heart is, according to the author, of great importance in regard to the continuation of the pulsations. After injecting ten m'gram of arsenic, the longest duration of pulsation was twenty-five to twenty-six hours. After injecting five m'gram, only six hours. The author injected into the right and left auricle of a goat's heart, which had just been removed from the body, and was pulsating slowly, arseniate of soda ; immediately after, the movements of the right auricle were augmented, and it continued to pulsate for one and a quarter hours. The reason why the movements took place in the right side of the heart only, the author thinks is, that in most of his experiments the arsenious acid had not sufficient time to permeate the left ventricle, which he always found empty of blood. He agrees with C. Schmidt in regard to the action of arsenious acid, that it checks the process of oxydation of the tissues. That it prevents decomposition is well known ; the writer saw freshly drawn blood of rabbits, which he had mixed with an equal measure of a solution of arsenic, one-half per cent strength, so slowly coagulate, that only after ten hours did he find a dense coagulum. The blood corpuscles were almost unaltered in shape, being only a little shriveled. In another portion of blood, mixed with an equal measure of water, the red corpuscles were entirely dissolved. The bottom of the clot with the arsenious acid was exposed to the air, and it, after twenty-four hours' exposure, acquired a bright red color ; the blood globules in the clot retain the normal form and size. Schmidt and Bretschneider noticed a remarkable power of preserving frog's blood. It has the same effect on muscular and nervous tissue ; these tissues retain their irritability longer after death, when imbued with the arsenious solution, than when nothing is injected into them. Concerning the therapeutical action of arsenic, he says that the different observations which have been already made, justify the conclusion that it depends on the retardation of the oxygenation of the blood ; or, perhaps, that the polarisation of the oxygen is prevented by arsenic, or that certain organic substances form a stronger combination with the arsenic, so that they are not easily oxydized.

ON THE SEPARATION OF STRYCHNINE SALTS BY CARBOLIC ACID.—When a weak solution of hydrochlorate of strychnine is shaken with some drops of carbolic acid, the liquid assumes the appearance of an emulsion. It has then little activity when administered by the hypodermic method, but this relative innocuousness is due to a simple sluggishness of absorption, and not to a destruction of the strychnine by carbolic acid—for, on removing this with ether, a limpid solution is obtained as energetic as at first. If the emulsion is carefully filtered, and the filtrate treated with ether, it has no longer any toxic property; on the contrary, that which remains on the filter, being diffused in water and freed by means of ether from the carbolic acid which it contains, forms again the strychnine salts at first taken. Carbolic acid has the effect, therefore, of holding in suspension the strychnine salt, and singularly facilitating its separation. The author has found strychnine can be easily separated in this way from putrescent animal matter.—*M. Paul Bert, in Medical Gazette.*

A NEW SUBSTITUTE FOR CHLOROFORM.—The subject of anæsthesia is yet in its infancy, and we may therefore be prepared to chronicle further discovery. Dr. Protheroe Smith has made some experiments with tetrachloride of carbon (C Cl_4) the inhalation of which he finds produces anæsthesia in a very short time, while the effect passes off equally rapidly. It is further stated that it does not produce some of the unpleasant symptoms that not unfrequently attend the administration of chloroform. Dr. Protheroe Smith has given it in several cases, and we sincerely hope the favourable opinion formed of it may be confirmed by further trial. We can well afford to add to our means of subduing pain and producing sleep.—*Medical Press and Circular.*

CHOLERA YEAST.—The investigations of Herr Klob and Herr Thomé, originally detailed in Virchow's *Archive*, point to the development of an enormous quantity of a vegetable growth in the intestinal canal of cholera patients. At a recent meeting of the Pathological Society of London, Mr Simon exhibited a specimen of the plant which had been given to him by Herr Thomé during his recent visit to the Continent, to attend the Cholera Conference just held at Weimar. Mr. Hulke and Dr. Sanderson were appointed to report on the subject, and we may, therefore, look with confidence for early and reliable information.—*Medical Press and Circular.*

Canada Medical Journal.

MONTREAL, MAY, 1867.

MONTREAL GENERAL HOSPITAL.

We believe it is contemplated by the governors of the Montreal General Hospital to extend the benefits of that charity, by erecting an additional building, for fever cases. This is an enterprise at once benevolent and commendable, and we feel certain that it will be well sustained by our fellow townsmen; indeed we have to record the noble donation of \$5000, from William Molson, Esq, specially for this purpose. But while we are fully alive to the necessity of an institution with the above object, we must be permitted to call in question the propriety of building a Fever Hospital, on the ground at present owned by this institution. What we should like to see is a large hospital built, with sufficient space around to preclude the possibility of its being encroached upon by other buildings—all will allow that the present Hospital is not in point of situation, in the right place; the growth of the city has been so rapid, and enterprise has developed to a certain degree our water privileges, the line of the canal, is beginning to present all that life which tells of man's industry and perseverance, the busy hum and smoke of the factory bears evidence of wealth fast accumulating; and it behoves those who have large interests in those establishments, to give of their substance, to provide a home for their operatives during sickness from disease or accident. What should be done, and what could be very easily done, is to secure a site some little distance from the city, but, which would be in reality nearer to the houses of the poor, who at the present day form the large bulk of patients attending the Montreal General Hospital, and on this site a surgical hospital, and a fever hospital, built on modern principles should be erected. This is no chimera. It only requires a little concerted action to render it a *fait accompli*. We feel certain that it is alone necessary to place the scheme fairly and in the right light before the people of Montreal, to yield a noble response; the present Hospital is totally unfit for what it was originally intended. The space is cramped, it is surrounded by buildings, and it is at an inconvenient distance from the factories and Grand Trunk works. Cases of accident are continually

occurring, and the unfortunate sufferer is obliged to be carried on a stretcher for miles to obtain that surgical aid which might be, under other circumstances, near at hand. But the most powerful argument against continuing the present building, is its total unfitness for the object intended. It is a Hospital certainly, and in the absence of a better, answers the purpose; but we fear that if the governors decide on further crowding the present limited space with additional buildings, that much evil will be done, and the present building injured very materially in a sanatory point.

If we take the experience of some of the London hospitals, we find that in many, if not in all, the entire internal arrangements have been remodelled. An improved system of drainage has been rigidly carried out, large and airy refectories provided, ample ward room, and healthful water closets, and baths attached; these are necessaries which in modern hospitals are always met with, and as a consequence a corresponding decrease in mortality. In providing these charities the object is not so much to give to the poor man a place where he can have his bed, board, and medical relief during an attack of illness, but that he shall be placed under those conditions, wherein he will be most likely to recover his health and strength. To a man recovering from an attack of illness, how grateful is his release from his sick chamber. While confined to bed he is obliged to eat, drink, sleep, and attend to the calls of nature in a limited space, but when convalescent it is far from encouraging to be still obliged to follow the same routine day after day, and all in a limited space. His food is brought to him, and he partakes of his meal without satisfaction or relish while he is in his ward; to live, sleep and eat, surrounded by disease and death, is a condition which is far from beneficial and unlikely to be speedily followed by that rapid convalescence which would undoubtedly follow, were he otherwise situated. The hospital property at present is large enough to enable the governors to put up three rows or terraces of dwelling houses which would readily rent from their close proximity to the city, and which would yield an income which would go far to render the institution, if built in another and more suitable place, independent of the continued and yearly solicitation for aid at the hands of the charitably disposed. There is material enough in the present building if pulled down to effect this change.

These are a few suggestions which we offer, and which we think should be well and carefully considered our only object and earnest desire is to see the Montreal General Hospital, continue a flourishing institution, of use to the community and a lasting monument of the charity, benevolence, and good judgment of its managers.

MCGILL UNIVERSITY, MONTREAL.

FACULTY OF MEDICINE.

M.D.C.M. Holmes Gold Medal Examination—Session 1866 & 1867.

This prize, which is the highest honour conferred by the Faculty of Medicine, is awarded on special written examination, extending over two days. It is alone open to the graduating class. The successful candidate this year was Mr. Clinton Wayne Kelly, U. S. Mr. Kelly also carried off the prize for the best examination in the final branches. His thesis on the subject of Uterine Hæmorrhage reached high, nearly the whole number of marks being awarded.

NOTE.—This Medal, founded by the Medical Faculty, is open for competition to those members of the graduating class who have undergone successfully their final examinations, and whose inaugural theses are deemed respectively worthy of 100 marks or more, the maximum number of marks for any thesis being 200. Complete answers to all the questions are equal to 400 marks (50 for each branch) making the total number obtainable 600.

SURGERY.

Examiner.....PROFESSOR CAMPBELL, A.M., M.D.

1. Describe the symptoms of calculus vesicæ and the principal operations for its relief.
2. Give the symptoms, causes and treatment of external aneurism.

CLINICAL SURGERY.

Examiner.....G. E. FENWICK, M.D.

What portions of the vertebræ are most liable to injury from indirect violence? Describe the lesions of the cord or its envelopes most usually met with on post mortem examination in these cases.

MIDWIFERY, &c.

Examiner.....PROFESSOR HALL, M.D.

1. What are the physical differences between the corpus luteum of menstruation, and that of pregnancy?
2. After the delivery of the fœtus in sacro iliac presentations, is the placenta usually found attached or detached from the uterine wall? What reason can you advance why the latter should be the more common condition, and is post partum hæmorrhage likely to supervene under these conditions?
3. What is the earliest symptom indicative of inflammation of the womb after labour? How would you distinguish between a threatened attack of this disease, and hystericalgia or after pains? And what treatment would you adopt in either case if presented?

PRACTICE OF MEDICINE.

Examiner.....PROFESSOR HOWARD, M.D., L.R.C.S.E.

1. Point out the leading features of the following diseases of childhood:—inherited syphilis, rickets and scrofulosis.
2. What are the pathological conditions productive of "non-inflammatory softening" of the brain, and what the circumstances that would strongly indicate the existence of that disease during life?
3. Mention some of the more important arguments illustrative of the mode in which cholera poison is reproduced and propagated, and enumerate briefly the "localizing causes" and personal conditions which favour its effective operation.

CLINICAL MEDICINE AND MEDICAL JURISPRUDENCE.

Examiner.....PROFESSOR MACCALLUM, M.D., M.R.C.S.L.

1. Describe separately a case of squamous and vesicular skin disease, and mention the points of distinction between the two forms.
2. Give the symptoms, causes and modes of termination of general mania.
3. Mention the symptoms indicating that wound of the lung has taken place, and describe fully the various consequences that may result therefrom.

INSTITUTES OF MEDICINE.

Examiner.....PROFESSOR FRASER, M.D.

1. Describe the functions of the sympathetic nerve.
2. What are the purposes served by the fibrine of the blood, and the diseases caused by its being deficient, excessive or perverted, that is, cacoplastic or aplastic?
3. Give the most reliable tests for albumen, sugar and bile in the urine, and explain the pathological causes of these abnormalities.

ANATOMY.

Examiner.....PROFESSOR SCOTT, M.D.

1. Enumerate all the muscles of both the superior and inferior extremity; also, the arteries distributed to each, with their relations and branches.
2. Describe the anatomy of the perineum in the male, stating what parts must be divided in the operation of lithotomy, and what avoided.
3. Give the relations of the arch of the aorta, and state the situation of both the superficial and deep cardiac plexuses, and the nerves entering into the formation of each.

MATERIA MEDICA.

Examiner.....PROFESSOR WRIGHT, M.D., L.R.C.S.E.

1. Give the way of preparing KI according to the British Pharmacopœa, and explain the various steps of the process.
2. Describe the actions of tartar emetic in the various doses in which it may be prescribed, and in overdoses.
3. Mention the uses of ipecacuanha, explain its modus operandi in dysentery, hemorrhages, asthma, &c., and name the combinations in which it might be taken, with their doses.

CHEMISTRY.

Examiner.....PROFESSOR CRAIK, M.D.

1. Describe the properties of hydrogen, the methods of preparing it, and state the reasons for regarding it as a metal.
2. Describe the different varieties of phosphoric acid, their modes of preparation, and the tests for each.
3. Describe urea and some of its derivatives.

ANNUAL CONVOCATION OF M'GILL UNIVERSITY.

The annual convocation of this university was held in the William Molson Hall on Thursday the second and Friday the third of May. On the second day degrees in the Medical and Law Faculties were conferred. G. W. Campbell, A. M. M.D., the Dean of the Medical Faculty, announced that the number of students who had matriculated and attended during the past session was 184. Of these there were from Lower Canada

eighty-three, from Upper Canada eighty-nine, Nova Scotia three, New Brunswick two, Prince Edward's Island one, Newfoundland one, United States four.

The following gentlemen had passed their primary examination on Anatomy, Chemistry, Materia Medica, Institutes of Medicine, and Botany and Zoology.

Reginald A. D. King, St. Sylvestre; Angus A. Gilmour, Granby, C. E.; Daniel Legault, Isle Parrault, C. E.; Edwin D. Ault, Aultsville, C. W.; Daniel M. J. Hagarty, Bornholm, C. W.; Daniel D. Smith, Cornwall, C. W.; James McNeece, Quebec; Guy D. Daly, Minnesota, U.S.; James J. Quarry, Lucan, C. W.; Marshall B. Wilcox, Whitby, C. W.; Silas Kneal, Woodstock, C. W.; Tancred de Grosbois, Chambly, C. E.; Daniel A. O'Connor, Montreal; Thomas G. Roddick, Harbour Grace, N. F.; George Stanton, Simcoe, C. W.; John E. W. Holwell, Quebec; Walter Moffat, Hickory, U.S.; Wm. McGeachy, Fingal, C. W.; Wm. Henry Patterson, Almonte, C. W.; William D. C. Law, Newtown, Robinson, C. W.; Donald Fraser, Quebec; Clarence J. H. Chipman, Montreal; Chas. W. Padfield, Burford, C. W.; John Perrier, Halifax, N. S.; Fred. W. Harding, Windsor, N. S.; Alfred O. Stimpson, St. Pie, C. E.; Algernon Wolverton, Grimsby, C. W.; Loran L. Palmer, do; John H. Wye, Brantford, C. W.; Wm. G. Bryson, Lindsay, C. W.; John W. Clemesha, Port Hope; C. W.; Donald Baynes, Montreal.

The following are the names of students presented for the degree of M.D., C. M., their residences, and the subjects of their thesis:—

Donald McDermid, Cornwall, C. W. Pythogenic Fever; Richard S. Markeil, Osnabruck, C. W., Modes of Death; Arch McLean, Sarnia, C. W., Reflex Paralysis; John Gillies, Morrison, C. W., Typhoid Fever; John R. Wanless, Montreal, Diabetes Mellitus; Elw. K. Patton, Quebec, Gonorrhœa; Peter A. McIntyre, Prince Edward Island, Dysentery; Henry W. McGowan, Kingsey, C. E. Cancer of the Stomach; William McCarthy, Henryville, C. E., Typhoid Fever; Jas Howard, St. Andrews, C. E., Idiopathic Erysipelas; Wm. H. Fraser, Perth, C. W., the Human Heart; Robert D. McArthur, Martintown, C. W., Plural Births; John Madill, West Essa, C. W., Enteritis; Wm. Grant, Williamstown, Embolism; J. C. Roberts, B. A., Fredericton, N. B. Heat; Wm. G. Bryson, Lindsay, C. W., Pneumonia; John Wordsworth, Clemesha, Port Hope, C. W., Fractures; Richard King, Peterborough, Signs of Pregnancy; W. Dougan, St. Catherines, C. W., Air, Exercise, and Light; James W. Oliver, St. Catherines, C. W., Peritonitis; William McGeachy, Fingal, C. W., Old and New Practice of Medicine; John Brandon, Warwick, C. W., Relations of Pulmonary and Cardiac Diseases; William B. Mallock, Ottawa, C. W., Concussion and Compression of the Brain; Loran L. Palmer, Grimsby, C. W., on Fœtal Auscultation; Algernon Wolverton, B. A., Grimsby, C. W., Dysentery; Clinton Wayne Kelly, Louisville, Ky., U. S., Hemorrhage of Pregnancy; Lafontaine B. Powers, Port Hope, C. W., Origin of Infantile Sphilitis; Clarence H. Pegg, Utica, N. Y. U. S., Hospital Gangrene; Francis Howland, Sylvan, C. W. Phthisis; John Vica, Montreal, Acute Pneumonia; Pierre E. Paradis, St. Denis, C. E., Abortion; Calixte Ethier, St. Joseph, Erysipelas; Dan O'Connor, Montreal, Dysentery; Henry Harkin, Montreal, Cause of Tubuli Uriniferi; J. C. Johnston, Asst. Surgeon, R. A., Montreal, Cholera.

William Gardner, Beauharnois, C. E., Valvular Heart Disease; Patrick Robertson, St. Andrews, C. E., Scarlet Fever; David M. Cassidy, Montreal, who were under age, but passed their examinations last Session, had their degrees conferred at this meeting of convocation.

The following gentlemen passed their Examination, but are not of age. Their degrees will be conferred at the next meeting of Convocation:—Charles O'Reilly, Hamilton, Chloroform; Clarence R. Church, Merrickville, C. W., Progressive Locomotor Ataxi; Geo. Dickenson, Ottawa, C. W. Light.

The Medical Faculty prizes consist;—First of the Holmes Gold Medal founded by the Faculty in honour of their late Dean; and two prizes in Books for the best Primary, and best Final Examination.

The Holmes Medal was awarded to Clinton Wayne Kelly, of Kentucky. The competition was very close between this gentleman and Wm. McGeachy, of Fingal, C. W.

The prize for the best examination in the Final branches was awarded, to Clinton Wayne Kelly. and in the Primary branches to William Henry Patterson, of Almonte, C. W., very closely pressed by Thos. G. Roddick, of Newfoundland. The gentlemen whose theses and examination were considered sufficiently meritorious to entitle them to compete for the medal were Messrs. Kelly, McGeachy, Pegg, Dickenson, Gillies, Malloch, Wolverton, MacLean, McCarthy, Clemesha, Paradis, Palmer, Church, McArthur, Fraser, Powers and McDiarmid.

The prizes in Natural History were awarded as follows;

Botany.—J. H. Matheson, 1st prize; L. Kneal, 2nd prize. *Zoology*—D. McCrimmon, prize.

Practical Anatomy.—Demonstrator's Prizes—Senior Class:—For general excellence as a practical Anatomist, to Wm. Moffat.

Students of the second and third years' course who deserve honourable mention as good practical Anatomists;—T. D. Lucas, John Reid, O. H. E. Clarke, and Clarence Chipman.

Junior Class:—Prize divided between Josiah Corliss and Wm. Sutherland.

Student of the first year who gave satisfaction for diligence and attention:—W. H. Robinson.

The graduates in Medicine were then called up, and the oath having been administered by Prof. Wright, the Degrees of M.D., C. M., were conferred by Principal Dawson.

The valedictory on behalf of the Graduates in Medicine was delivered by Dr. Powers, after which they were addressed by Professor Campbell, the Dean of the Medical Faculty, which closed the proceedings of this faculty.

The Medical evidence and an abstract of the general evidence adduced on the trial of Modeste Vilbrun alias Provencher, for the alleged wilful murder, by poison, of François Xavier Joutras. At the criminal term, held at Sorel C.E., in March 1867, before the Honorable Mr. Justice Loranger.

We are indebted to Mr. James G. Johnson of Montreal, for the following translation of the Judges notes taken at the above trial. It is a case of great importance, involving as it does a question of high scientific interest to the profession. The presence of strychnine was satisfactorily demonstrated by the colour test, the process employed was one differing somewhat from those laid down by medico-legal authorities as the rule in seeking for the evidence of strychnine, and was first published by Messrs. Rodgers and Girdwood as early as 1856. See London Lancet.

EVIDENCE FOR THE CROWN.

DOCTOR EDMOND GILBERT PROVOST—Deputy Coroner, states:—I held an inquest, by order of the Coroner of this district, upon the body of a man called François Xavier Joutras, on the 2nd day of January 1867. I went to the inquest in company with Dr. Ladouceur of St. Zephirin. I went to the house of deceased which was about a league from St. Zephirin; I there found a corpse in a room on a bench. The people present (about 100) told me it was Joutras' body; it was about 8 o'clock in the evening. The corpse indicated recent death; I swore in a jury in presence of the body, and I also swore in Dr. Ladouceur to make the autopsy; I first had the body properly identified, and I then proceeded with the inquest and made my report, which I afterwards gave to the Coroner.

The Coroner, Dr. Turcotte, was here sworn and produced the report of the inquest. He stated that Dr. Provost had been appointed by him as his deputy.

Dr. Provost continues:—The document which is here produced to me is the report of the inquest which I held on the 2nd January last, on the body of the deceased Joutras.

Cross-examined:—I cannot say how many people were present at the inquest. The room was full; I first examined the witnesses during which time Dr. Ladouceur was making the autopsy. The crowd had not access to the room in which the autopsy was being conducted. The jury were only there at the commencement.

The post mortem examination terminated about sunrise next day (3rd January). All the depositions were written by my clerk. The "viscera" of the deceased were given to me by the doctor at his house, situate about $\frac{3}{4}$ of a league from Joutras'. I was in company with the doctor all the time. The "viscera" were given to me in a glass jar. I could easily see the contents of the jar as it was transparent. I gave the jar to the Coroner who handed it back to me and directed me to make a chemical analysis of its contents.

MARIE FLOURDE, wife of Michel Oajolette:—I know the prisoner at the bar; also F. X. Joutras. I live about a league from Joutras. On the 22nd of December last he came to my house on horseback. He called me out, and said he was

very ill, and thought he was dying; that he had no control of his legs, and that he was suffering martyrdom. He asked me to try and dismount him, or at least to drag him to the ground, saying that I should then be able to drag him into the house. With the help of my boy, who went on one side, whilst I went on the other, I slipped him off his horse to the ground close to the door of the house. I got him into the house, and seated him on a chair; whilst I was taking off his boots he cried out terribly, but told me to go on, whether he screamed or not. After taking off his boots he continued to complain, saying that he would lie down, but was not able. I helped him up, when he said: "Sit me down again, I am going to die." I dragged him to the bed, and, with my son's help I laid him on it. He told me that whilst in the woods he thought he should die. I sent for a doctor. Before the doctor arrived, deceased repeated several times that he had great sorrow, which made him worse. He complained of pain in the jaw, and asked me for some salt, which he said might do him good. He said when he arrived he was only attacked in the legs, but now he was attacked in all his limbs. He told me he had drunk some liquor, which Modeste Provencher had given him; he said he had about a tumbler full of it in a flask, and that he drank about half of it; the remainder had remained in the flask. He said he offered it to père Modeste Provencher, who would not take it, telling me to keep it, and drink it after eating. He said Modeste Provencher had left him as soon as he had given him his drink. He then commenced his dinner (after drinking), and the pains took hold of him at once. The place in the woods where he was working is about sixty arpents (a little over two miles from my house.) Exactly at 12 (noon) the prisoner, Modeste Provencher, passed my house, and ten minutes afterwards Jourtras arrived. The prisoner was coming from the direction of the wood, and was going towards Jourtras' house. Jourtras said that his illness in the woods commenced by a feeling of sickness or nausea (*mal de cœur*), and that after that he had been attacked in the legs. He said he had shouted as he never had shouted before in his life; that neither his lungs nor his stomach were attacked. When I gave him the salt he put it into his mouth; he did not vomit. Whilst lying on the bed his body became arched, and rested only on the head and the heels. His body was as stiff as a bar of iron. He did not complain of internal pains. The flooring of our house is not solid, and if, in walking over it, we made his bed shake, he would start and cry out. He always cried out if he was touched. His mouth was shut tight. He spoke easily, and with difficulty, at intervals. He continued to get worse. Jourtras said he would like to see his wife; I sent for her, and she arrived after the doctor. The patient got better about five minutes after he had taken remedies. The wife of deceased went away, saying she would go and get some bread, &c., to make her husband some soup; we had no bread in our house. The doctor arrived at 2 o'clock, and left about 3 p.m.; the woman left soon after he did. I remained alone with the sick man from that time till half-past four, when my husband came in. Modeste Provencher arrived with the wife of the deceased about 7 o'clock, or half-past. The patient was then much better, and had no relapse. He got up at 11 o'clock, and ate at table. Modeste Provencher and Jourtras and his wife stayed all night with us. We went to bed about midnight. They left next morning at daylight. When he came to our house, Modeste Provencher said to

Joutras: "Poor child, you must have wished for me in the woods; why did you not call to me?" Joutras answered: "I cried out as loud as I could." Provencher then said: "Poor child, if I heard you, I would have gone to your assistance."

MICHEL CAJOLETTE, farmer of St. Zephirin states:—I know the prisoner; I remember the 22nd of December last, I helped the prisoner to put his horse in my stable. We talked of deceased's illness. He told me that he had left him in the wood, that he had prepared a mixture of absinthe for him and that he had given him a drink before leaving him; when he gave him the drink, deceased had told him to help himself, but the prisoner had answered that he was going away and did not want any and said to Joutras, "if you cannot take it all now take the rest after your dinner. I went to the house of the female prisoner on the Monday and she drove me back home. A day or two before she was arrested, she told me on the road that nobody could prove that she had poisoned her husband, she repeated the same thing at my house.

Cross-examined by Mr. Chapleau:—I saw nothing extraordinary in the woman's telling me that nobody could prove she had poisoned her husband. I know of nothing against the prisoner. I was pretty intimate with deceased, he never complained of anything. The deceased was in the habit of taking drink with him to the woods. I have drunk with him. "Père Modeste" said to him "you must have missed me in the woods" and deceased had replied that he had called out and that he should have liked to have him with him. They were good friends. I never saw deceased take liquor that produced the same effect on him as this.

Dr. LADOUCEUR:—On the 22nd December last I was called about noon to go and see F. X. Joutras. I went to Mr. Cajolet's. On arriving I found F. X. Joutras on a bed; upon seeing me, he made a bound on the bed; he said: "Doctor, come quick; I am going to die." I reassured him; I asked him the cause of his illness, and he said he had gone chopping wood with Provencher, and that about noon Provencher had left with him a bottle of bitters to drink before his dinner; that he had drunk a glass of it just before eating, and that a few minutes afterwards he was taken ill. He described his illness as follows: He was taken with numbness of the legs, and that in a very short time his legs stiffened, and he fell down; some time after, being a little better, he got upon his "Suisse." That going over a stump his "Suisse" broke, and that after much trouble he succeeded in getting upon his horse's back. I then stopped his talk. His pulse was strong and quick; he complained of oppression in the throat, great pains at the pit of the stomach, pain in the neck, stiffness of the extremities, in which the body participated; his chief pains were in the inner part of the thighs, as if the nerves were trying to contract. The least noise or movement increased these pains in his epigastrium and elsewhere. He begged me not to touch him, as it hurt him excessively. The pain in the pit of the stomach increased, if I touched him. He did not complain of headache; his intellect seemed clear. Before remarking these symptoms, I had given him a dose of opium and sulphuric ether. Some time after this (a few minutes) he said he was somewhat better, and told me he had many troubles. To distract his mind, I offered him a smoke, and filled his pipe with tobacco, and lighted it, and put it into his mouth, because he seemed not to be able to take it into

his hands. As I saw that another spasm was coming on, I prepared him another calming dose, but of a smaller quantity. His wife arrived about that time. He had another spasm before I could give him the second dose. I made him take it, and at the same time took a strong hold of his thighs, despite his entreaties to the contrary; I rubbed them hard, especially on the inner surface, where he said the pain was strongest, and I bent his legs backwards and forwards. All this time he had tetanic convulsions. The convulsions caused him to bound upon his bed. After rubbing him for some time, he got better. I placed him, by means of a pillow, in a nearly sitting position, and gave him another smoke. He wished to take his legs from the bed, as he was perspiring violently; I did not object, but after a little while I made him put them up again. He said the stomach was much better, but that there was still some pain left. I was going to give him another calming dose before going, and prepared and gave him one-quarter of a grain of morphine in a little warm water. He asked me whether I thought it was rheumatism, because he said he had had some before, but that this time it was much more violent than usual; that in previous attacks he had never had the spasms or bounds. Upon being asked what was the matter, I answered him (not being quite sure) that, if it were rheumatism, I had never before seen anything like it. As I was going away, he asked for a purgative, as he thought he was bilious. I went back home, and sent back two purging powders. I heard nothing until the 24th, through the parish priest, who said he had been giving the sacrament to Joutras, who was very ill. On the 25th the wife of Joutras came to me after mass, and asked me for something for her husband, for pains in the stomach, and I gave her a compound ipecac powder, I saw Joutras again only on the 31st, about 11.30 A.M. On coming into my house, he said: "It is my turn to come and see you, now that I am better." He requested me to go on treating him as I had done, so as to try and set him up again altogether. He said he thought I could cure him, if I tried. He said he was much better, but that his legs were still weak. He also complained of burning at the stomach, and want of appetite. Whilst preparing remedies for him, he asked me whether drink was bad for him, saying that on the evening of the 29th he had taken some absinthe and belle angelique drink, and that some time after he had severe pains; that they lasted a shorter time than on the 22nd; he also said that he had taken the same mixture of absinthe and angelique between the 22nd and 29th, and that he had pains immediately afterwards, which was the reason for his asking if drink was bad for him. I told him that it was evident it was bad for him, as he was ill each time he took any. I then advised him to drink hot milk, instead of liquor. I now began to suspect, and I gave him eight powders of carbonate of magnesia and carbonate of iron, telling him that the magnesia would calm the heartburn. He again said he had many troubles, and added that he was unhappy, living as he did. He then left me, and I never saw him again, until called upon to make a post mortem examination of his body, on 2nd of January. On the 31st December, Modeste Provencher, about 11.30 P.M., came to Moses Hart's, where I was. He said he had come to see me about Joutras, who was taken ill; that he had taken one of the powders I had given him that day, and he did not think it did him any good, as he was ill after it. I said, "I will go and see him;" but he answered, "I did not come to fetch you—I came to fetch some medicine like what you

gave him at Cajolette's, when he was taken ill in the woods." I went to get the powder; I weighed out three-quarters of a grain of morphine, and gave it to Provencher for the sick man. Provencher said he had a hard time of it, as the horse he was driving wouldn't keep the road, saying it was Joutras' horse, and saying: "If it was mine, I should have been home long since." Provencher then left. The next day (New Year's), in the morning, a man, called Narcisse Joutras, came and told me that F. X. Joutras was dead, at which I was surprised. On the 2nd January, on the requisition of the deputy coroner, I made a post mortem examination of F. X. Joutras.

Report of post mortem, forty-eight hours after death.—In the external examinations, I found that the extremities only were rigid. The lower surface (or back) of the corpse, which was lying on the back, was covered with ecchymosis of a violet colour, excepting at the neck, where the colour was very black. After making an incision through the cellular tissue on each side of the sternum, a great quantity of serum escaped. Upon opening the thorax, I found the pericardium of a red colour, being probably the result of infiltration after death. I found in the interior of the pericardium nearly two ounces of black blood. The heart, of natural size, was completely dilated in its auricles and ventricles. The outside was of a darker colour than is natural; its cavities were empty, and presented the same appearance as the exterior. The lungs were much congested, of a black appearance, especially in the posterior part; they were very friable, and, upon pressure, a dark brown froth came out. There was an escape of about one pint of black blood in the right pleura; the left one contained a little more. On the posterior part of the lungs there were small white deposits, which, upon being opened, gave out a froth of the same colour. The aorta, as well as the large vessels, were empty. I found no trace of disease in any of them. The brain did not present a natural appearance in all its parts. The dura mater was moderately congested. Towards the middle of the frontal bone—between this bone and the dura mater—was found a whitish substance, very brittle, and about a line in thickness. The arachnoid was strongly congested in its whole extent, especially towards the lower part. The white substance of the brain was but slightly vascular.

Abdomen.—Liver of an ordinary size strongly congested with black blood, the right lobe was softened and friable, especially at its posterior part. The gall bladder contained about one drachm of bile. The kidney was slightly swollen and much injected with black blood; the spleen was of considerable size and like the other organs contained black blood; putrefaction was far advanced. The stomach measured eighteen inches in its greatest length on the large curve, and twelve inches in its greatest circumference. It contained a large quantity of inodorous gas; the internal surface was covered with a thick black mucus—I did not examine the stomach further, as I wished to preserve it in case of analysis.

Intestines.—The external surface of the transverse portion of the duodenum was of a redish colour and appeared congested. The internal surface was also congested; upon scraping the surface with a scalpel, I detached a layer of redish brown mucus. The ascending and descending portion seemed more slightly inflamed, the rest of the intestinal canal was in an extraordinary state of putrefaction, and it was difficult to distinguish traces of inflammation, which in 1807

case must have been very slight, so that I can not give an opinion concerning the alimentary canal unless analysis of its contents is made. I said before the coroner's jury, that I could not explain Joutras' death from what I had seen of the illness. I could not say, without analysing the alimentary canal, &c., as I did not find in my post mortem any certain cause of death. I was asked by Joutras' wife, when I said I could not account for death, whether I had a spite against her. I said no; but I thought Joutras did not die naturally. I had tied the stomach at the two ends; I had also tied the gall bladder, and divided the colon. A part of the small intestine (duodenum transverse) was also attached to the stomach: these remains were put on a plate, furnished to me by the deputy coroner, and were covered with paper and a towel. I asked more than twenty times for a large wide-mouthed bottle, and was unable to get one, and a plate was all I could get. Whilst I was making the post mortem, people kept coming into the room; I could not keep them out. I had an assistant, Mr. Hart; and Lahaie, another man, lighted me. I took all the precautions I could with the facilities afforded me, but they were few.

Examination resumed.—On the 31st December, Joutras brought me back a powder, saying it was the powder that I had sent on the 25th. I saw Mrs. Joutras on the 4th of January, at my house; it was the day of her husband's funeral. She said, "Doctor I am in a bad position; I don't know what they want to do to me, they wish to kill me with troubles." She asked me if I was angry with her, and I said I had no reason to be.

There were intervals between the tetanic convulsions that Joutras suffered when I saw him at Cajollette's; whilst they lasted his jaws became closed, and fixed, but parted again as soon as they ceased. In the *post mortem* examination I discovered no cause of death. The symptoms that I observed on the 22nd December were similar to those that would exist in poisoning by strychnine; from what Joutras told me on the 31st, I should attribute the symptoms he described of his illness between the 25th, and that day, to poisoning by strychnine; I do not say they were, but they certainly resembled them.

Cross-examined.—It would have been possible for any one smart enough to introduce foreign substances into the body, but I did not divide the stomach from the body until after the examination was finished; I never left the body out of my sight during the examination; I smoked all the time and would have drank, had I had the wherewithal. I never saw a case of poisoning by strychnine. The symptoms of poisoning by mushrooms might be similar to those of poisoning by strychnine. I never saw a case of trichina spiralis; nux vomica resembles strychnine in its effects, but the former contains the latter, about 1 gr. in 300. Half a grain of strychnine is supposed to kill, but I cannot say whether even three grains must. I have seen traumatic tetanus. Idiopathic tetanus I have never seen, but from what I have read I believe that the symptoms may be like those of strychnine. I do not much believe in idiopathic tetanus, but think that in most cases there is some wound which is perhaps not discovered.

By the Court.—It is impossible to state a given quantity of any poison that must indiscriminately kill any one.

Dr. GIROUX, of Three Rivers, states:—On the 30th December last, a person came to my office at Three Rivers, and asked me whether I would oblige Dr. Smith, of La Baie, by letting him have a little strychnine. That person, I believe, I recognise in the prisoner at the bar. At the time of this application being made to me, a man called Didace St. Pierre, whom I now recognise here, was seated in my office. I at first refused the request for strychnine; upon being pressed, I, after some deliberation, yielded, not thinking that any harm would come of it, and I weighed out and gave the applicant, who said his name was Joseph Therien, of La Baie, eight grains of strychnine, for which he paid me half a dollar. He put the poison, which was wrapped in paper and labelled "poison," in his pocket, and asked me whether it was dangerous, or could hurt him to carry it in that way. I told him that he ran no risk, so long as he did not take any. I did not believe the strychnine was for Dr. Smith but imagined it was wanted for the purpose of poisoning foxes.

Cross-examined:—I am not a druggist. This is the first time I ever sold poison to a stranger, and it shall be the last. When I heard, on the 2nd January, that there had been a case of poisoning, I had misgivings, which I still entertain. I should very much like to see my strychnine back. I stated that the person who came to me wore a heavier beard than the prisoner, and that he had a moustache; and I still swear that the person that came to me on the 30th December did wear a moustache. Some seven or eight days ago Hilaire Provencher and his brother came to my house for medicine; and when they told me they were from St. Monique, I asked what sort of character the prisoner bore, and was told, "very good." I did not say that he deserved to be hanged, like a dog, and that my evidence would hang him; what I said was, that it was unfortunate that a respectable man should get into such a scrape, more especially as he would be hanged, if convicted.

DIDACE ST. PIERRE, of Three Rivers, states:—On the 30th December last, between 12 and 1 o'clock, P.M., I was at Dr. Giroux. A man who called himself Joseph Thérien came in whilst I was there. I am positive that man is the prisoner at the bar. I had nothing else to do than look at him whilst he was talking to the doctor; he asked the doctor for some strychnine for Dr. Smith, of La Baie, as a favour. I saw the Doctor weigh and wrap up something, and he then wrote "poison" upon the paper; I cannot read, but the doctor told me that was what he had written. The prisoner asked whether carrying the strychnine in his pocket could harm him, and he was told there was no danger so long as he kept it out of his mouth. I fancied the poison was wanted to kill foxes. I think the prisoner wore a grey capot and trousers, and otter-skin cap. I saw the prisoner again the day before yesterday (Thursday) in jail. Mr. Armstrong sent me to see whether I recognised him. The man I saw in jail is the same man I saw at Dr. Giroux, and I recognised him at once. The only difference in his face is that he has taken off a moustache, which he wore when I saw him the first time, and that his beard has been trimmed. I have never spoken to Dr. Giroux on this subject, either here or elsewhere. The only person whom I have spoken to about the trial is Mr. Armstrong. I swear that the person who came for poison to Dr. Giroux on the 30th December last was the prisoner at the bar.

PIERRE ELZEARD POTHIER, merchant, of Three Rivers, states:—I have known

the prisoner of the bar for about a year and have often sold him goods during that time: the last time I saw him was about the 30th December. It was on a Sunday morning, between 8 and 9 o'clock. He brought me a letter from Mr. Moses Hart, of St. Zéphirin; I saw him about one o'clock, p.m., that day, and at about one, or half-past one o'clock, p.m., I left Three Rivers with him to go to St. Zéphirin. When I saw him in the morning, he told me he wanted some things at the doctor's; from what he said, I understood that he wanted medicine for Dr. Ladouceur, and I recommended him to go to Mrs. Vallée, as she was a widow, and it would help her. Mr. Hart had written, saying that he had sent Provencher to fetch me; but he (Provencher) said the roads were so bad that he did not think he could take me, and he left me, saying he was going to Mrs. Vallée's. I saw him again after mass, and he said he had decided to take me, if I liked; we got to St. Zéphirin that night. I saw the prisoner again at about half-past eleven on the night of the 31st December, at Mr. Hart's; he came there to see Dr. Ladouceur, to get a powder for Joutras, who, he said, had been taken ill. The doctor offered to go and see him; but the prisoner said he had not been sent to fetch him, but to get a powder. He only stayed a few minutes at Mr. Hart's.

Cross-examined:—He told the doctor that Joutras had taken one of the powders he had given him, but that it had done him no good, and that he had come to get a powder like the one he had given him at Cajolette's. I cannot say whether the prisoner wore a moustache the day I saw him in Three Rivers. He wore a dark grey coat; that I can swear to.

Dr. JOSEPH A. SMITH, of La Baie, states:—I know the prisoner at the bar; the first time I saw him was on the 20th December last; he came to me professionally, saying that he was ill; could not sleep; had no appetite, and often suffered from acidity of the stomach; he asked for a purgative. I prescribed an emetic for him, which my son prepared and gave to him; and I also gave him a small quantity of laudanum, to make him sleepy.

JOSEPH LEMAIRE.—I know Modeste Provencher, the prisoner; I knew the deceased; I live nearly opposite to where he did. During the last week of his life he was sometimes well and sometimes very ill. I was present twice when he was ill. The first time was on Christmas eve. Modeste Provencher, on that day, came to me about 6 a.m. to go and see whether I thought he was ill enough to send for the priest. I went; he was quiet, I placed my hand on him, and he made a bound and cried out, saying not to startle him, that it excited him. I was with him about a quarter of an hour; I went back again in about half an hour, my feet being covered with snow, I stamped them to shake it off; the deceased cried out and bounded. The priest came about one hour and a half after I went in the second time; when the priest was giving him the communion the deceased seized his hand and guided it to his mouth, and kept hold of it during the whole ceremony; he seemed to take hold of it so as not to be startled by it. I left as soon as the ceremony was over. On the Sunday following the deceased came to my house; it was the Sunday before New Year. During his easy moments on the 24th, he was quiet enough and spoke well. On the 31st Dec., I again saw deceased at his house at about 7 p.m.; he was then ill. I had seen him that afternoon with his horse; in the evening he was on his bed and alone, I said, try and get up, and he sat up on his bed with ease; there was no light or

seat in the room, and being tired, I went to the kitchen where I found the prisoner, and Sophie Boisclere. I told deceased to come and chat with us and he came; he asked for something to eat, and his wife gave him some soup. He complained of cold about a quarter of an hour after coming into the kitchen. We went on chatting about ten minutes. He then said he did not think he was able to get up, and I said, "Oh! get up you can do it," and he did it easily and walked round the table. He then complained of his heart, (*cela lui travaillait le cœur*) and then said his feet were getting numb, he then went to the stool and was windy. Modeste Provencher said, it seemed to affect his behind, and they both (Provencher and Sophie Boisclere) laughed; I went home, leaving him on the stool. When I left Jontras, the only people in the house besides the children were Modeste Provencher and Sophie Boisclere; I was called by one of my children, and told to get up, as Jontras was very ill; my wife went there whilst I was dressing; when I got there he was in convulsions, and Modeste Provencher was holding him. The spasm lasted one minute to one and a half minutes after I arrived, he then got quiet. He said to me, "you never went for the doctor;" I answered, no because I never was asked, but that I could go then. Modeste Provencher asked me if I would stay, and that he would go for the doctor, and he got ready. I held the patient, who liked being held. In a very short time he said he has not gone yet; a little time afterwards he repeated it. He repeated this a third time, but of course he found the time long. The third time the remark was made, I think Provencher had time to go, but I did not think the delay was excessive. When he was telling me this he had spasms, and it was during them that he made the observations; he became calm at intervals and then said he was going to die, he was praying all the time.

In the last spasm in which he died, he spoke with difficulty and followed me in prayer as best he was able. Some minutes before he died, he said his tongue was drying up, and I told him to try and moisten it with his spittle; he tried but could not do it. Before his death his wife was in the room, but not in the same room at the time of his death; one of my sons was in the room; my son's name is Xavier. One of his cousins arrived whilst he was insensible, but before he had ceased to breathe. His wife asked soon after his death whether he was dead, and we answered, "yes." She then asked me to send my son to meet the doctor to send him back, saying it would cost her less; my son went and came back with Provencher about an hour afterwards. I asked Modeste Provencher if he had fetched the doctor, and he said no; that the doctor had said he had seen him that same day and that it was not necessary to go and see him again, but would send him a dose. From the time I last went to the house up till Jontras death may have been half an hour—during the spasm the deceased was greatly excited; his body seemed to stiffen and bound as well as he could, considering nearly my whole weight was on him; his head jerked backwards, and his body and his legs jerked in the last spasm; the body remained stiffened until he died. After the spasm in the limbs, his face became contorted, he died with fixed jaws; during the contortions of his face it changed colour, but I can't describe it. The hand I held pressed mine, but I took it as a farewell. When my arm passed round his body it was in a profuse perspiration. He was sensible to the last.

Cross-examined.—He was insensible perhaps a couple of minutes before dying. The face assumed a natural aspect soon after death. The deceased made no

complaint whilst dying. The last spasm may have lasted eight or nine minutes about, and the one before that I think was a little longer. I never saw children in convulsions. I held deceased at his own request; he said he was easier when held. I did not see any shiverings

After the death of Joutras, I had a glass of whisky with Provencher before dressing the body. He spoke up to within a few minutes of his death; when I dressed the body the face was tranquil, and like that of a corpse in general.

LUC TRAHAN, PRIEST OF ST. MONIQUE.—I am the priest of the parish St. Monique, I knew the prisoner, also deceased; on the 24th of December last I administered the last sacrament to F. X. Joutras; I was fettered by the prisoner. I arrived in the forenoon, and when I arrived there were many people there; when I arrived at the patient's room door, he made a bound upon his bed, crying out; I commenced to confess him; he was calm at the time and spoke well, and had all his senses. When the confession was finished I prepared to give him the holy wafer; he seized the wrist of the hand in which I held the holy wafer, I gave communion without disturbing him; he held my wrist all the time. When I had finished I proceeded to give him the extreme unction and in anointing him I noticed him shiver at each touch; when they prepared his feet for anointing he jerked spasmodically. I finished the ceremony and he then remained quiet; I spoke to him for a few minutes afterwards. About that time he told me he was in great trouble; he did not say about what; I never saw him again. I have administered many thousand persons, and never saw an illness like Joutras', except one other person; I can not say what the cause of death was in that case.

Cross-examined.—The confession of Joutras took about fifteen to twenty minutes; Joutras spoke quite easily. The jerking of the feet was not violent when I anointed them; I don't know whether the body was agitated. He was in a reclining position and had nothing in his hands; we anoint the eyes, nose, mouth, ears, hands and feet. He never tried to prevent my anointing him. He did not hold my hand at all whilst I was administering the extreme unction. He seemed calm nearly all the time I was there. It was my impression that he held my hand for fear of being startled by it.

JOSEPH JOUTRAS.—The hands of the body were clinched and the toes bent down. The limbs were very stiff, so much so that it was with difficulty we took off his clothes; he had not taken his clothes off since he came in, and had his greatcoat on.

I never saw deceased when he had spasms; I was not asked by the coroner whether the deceased's hands were clinched and feet bent, and I did not think necessary to say so.

DR. PROVOST.—The bottle which Dr. Ladouceur placed in my hands on the 3rd January last, containing some of the viscera of F. X. Joutras, I gave it to the coroner who gave it back to me and told me to analyse the contents; I produce that bottle, it is marked Estomach de Joutras 10. This bottle was corked and sealed when given to me. The bottle now contains the paper that was used for filtering during the chemical analysis; I gave the bottle to the coroner on the 4th of January, and received it back on the 7th.

DR. TURCOTTE.—I placed the bottle here produced in the hands of Dr. Provost on the 7th January, in the same state as it was when given to me by him on the 3rd or 4th. I had kept it under lock and key in a trunk in Dr. Provost's labora-

tory. Dr. Provost kept the key. I am nearly certain that it was on the 4th that I received the bottle, I did not place a ticket or any private mark on the bottle, or on the trunk it was placed in. The ticket was on the bottle at that time; it is written by Dr. Provost whose writing I know; on the 7th of January I placed the bottle in Dr. Provost's hands for analysis, and swore him and Dr. Bruneau to make it.

Dr. Provost.—It was on the evening of the 7th I received back the bottle from Dr. Turcotte; it was in the same state as when I received it from Dr. Ladouceur. That same evening we commenced our analysis, (Dr. Bruneau was present when I received the bottle at my house between 7 or 8 p.m. on the 7th). I made a report of our proceedings; we made notes as we went on; I recognise our report in the one now produced. The same evening that I was sworn in with Dr. Bruneau, I am positive that the bottle could not have been opened since. I received it from Dr. Ladouceur on the morning of the 3rd; we opened the bottle, and found in it a stomach, duodenum, gall bladder and part of the colon; the œsophagus had not been separated from the stomach, and there were four ligatures, one at the cardiac orifice, another tying up an incision that had been made in it, another that tied up the canal between the gall bladder and the ductus communis choledochus, and the fourth at the extremity of the duodenum; the stomach was empty and contained only a small quantity of mucus (about two ounces) which adhered to the coatings; this mucus was taken out and placed in a bottle for analysis. The mucus of the stomach was of a dark red with black spots. The mucus membrane of the duodenum was of a pale red throughout; it was empty; the part of the colon which we had was but little injected. The gall bladder contained about one drachm of bile, and nothing else remarkable. A small quantity of mucus taken from the stomach was tested for arsenic by Reinck's process; the small copper needles that were used for this purpose were tested in Marsh's apparatus. They produced no change in the character of the flames formed by the combustion of the hydrogen that the process gave out; it made no mark on a piece of porcelain that was held in it; we also discoloured a portion of the mucous with animal charcoal; the liquid reagents, such as ammonio-nitrate of silver, hydrosulphuric acid, and ammonio-sulphate of copper, produced no change of color; these experiments proved to us that the stomach did not contain arsenic.

The remainder of the contents of the stomach was tested for strychnine by Stal's process, we operated on the mucus with diluted acetic acid, heated the mixture during an hour, filtered it, evaporated it to one half, and treated it with alcohol; we then evaporated to dryness; the remainder was then boiled in distilled water placed in a tube and shaken with three times the amount of ether. The ether was then drawn off and evaporated on a porcelain dish. The residue obtained by this process had a bitter taste, upon adding to it a drop of concentrated sulphuric acid and a small crystal of bichromate of potash; on moving this on the dish it left a dark blue mark, passed to violet, purple and finally red. I concluded that these symptoms could only belong to strychnine, *i. e.*, that the mucus I was examining contained strychnine; of all the mucus in the stomach I took one-third to test for arsenic, and two-thirds to test for strychnine. At this stage of my analysis, the crown counsel came in with Dr. Girdwood of Montreal, and he told me that the government had named a chemist whom they

wished to help me in my work. Dr. G. P. Girdwood was the person named That at least was the substance; I made no objection with the proviso that all his experiments should be made with my consent and in my presence. This was on a Friday, in February. I gave Dr. Girdwood the stomach, and gall bladder which were in separate glass bottles, and sealed (I had on the 7th of January, placed the viscera in four different bottles), to analyse them in my presence. (Description of process overruled). The duodenum I treated by another process which I found was much quicker (for strychnine). The basis of this process is the use of hydrochloric acid and chloroform, instead of acetic acid and ether. The mode of acting was this; I first chopped up the duodenum, which was placed in distilled water, with one-sixth of its weight of hydrochloric acid. This mixture was heated on a vapour bath, until dissolved. I then let it cool to separate the fat, and then filtered it; the residue was washed in distilled water, and the liquid obtained by filtering, was treated with excess of ammonia and sulphate of magnesia, refiltered and treated with chloroform, and shaken up. I then drew off the chloroform, evaporated it on a dish, and treated the residue with concentrated sulphuric acid which was treated for several hours to destroy organic matter; it was then diluted, refiltered and more chloroform added; this was then evaporated on a dish, and then tested with sulphuric acid, and bicromate of potash and binoxide of lead. The same series of colours were produced as by Staas process, *i. e.*, blue, violet, purple, and from these to red. I came to the conclusion from this that the duodenum contained strychnine.

DR. TURCOTTE.—At the same time, that I gave Dr. Provost Joutras' viscera, I gave him a packet containing six powders that I had received from him, and which I asked him to analyse; this was all I gave him.

DR. PROVOST.—The coroner on the 7th January, gave me a packet containing six powders, of a red and white mixture, and another small white one; the small one weighed one grain and three-quarters, had a bitter taste and no crystalline appearance. I treated this powder with nitric acid, and it gave a precipitate of a red orange colour, which became darker upon adding ammonia; upon adding chloride of gold it gave a pretty yellow, with perchloride of iron a blue; which led me to the conclusion that it was a preparation of morphine. The other six powders were carbonate of iron and magnesia. On the 24th January, I was given some things to analyse, and among them was a packet that the coroner told me contained some things found in Joutras' house.

DR. TURCOTTE.—On the 24th January or thereabouts, I gave Dr. Provost a bottle containing a sprig of absinthe, and also a packet containing two powders and a pellet of grease.

DR. PROVOST.—This packet was given to me and Dr. Mignault of St. Michel de Yamaska; upon opening this packet, we found two powders, one of which was sulphate of magnesia, which we tested for strychnine and found none. The other powder was smaller than the first; it weighed eight grains, and was neatly folded up as if by a Doctor. The powder was white, and under the microscope showed octohedral crystals. This powder was proved to be arsenic; we tested it for strychnine but found none, the pellet which the packet contained was composed of two pieces of suet stuck together, and upon being opened we found in the centre about one grain of white powder of a bitter taste which turned out to be strychnine; these powders, as well as part of the intestines, that were

not analysed, and a small quantity of strychnine obtained from Joutras' stomach were given back to the coroner. The powder contained in the pellet was also analysed by Dr. Girdwood in my presence. With Dr. Bruneau, I analysed the contents of the stomach, the duodenem, a powder containing morphine, six powders of carbonate of magnesia and iron; with Dr. Mignault I analysed a pellet containing strychnine, an arsenic powder, and some sulphate of magnesia. Dr. Girdwood analysed the stomach and gall bladder in my presence, and also a portion of the powder contained in the pellet. He also verified my experiments for arsenic. The colours obtained in testing for strychnine by sulphuric acid and bichromate of potash are seriatim, blue, violet, purple and red. I only saw Joutras after his death; he must have weighed about 140 lbs. I concluded from the whole of my analysis that the viscera given to me contained strychnine. I can not say the exact quantity they contained, but there was a good deal of it. I can not make an exact calculation of the amount of strychnine that would be contained in the whole body. I have heard the evidence in this case, and from the symptoms described in the case, I am of opinion that the deceased F. X. Joutras during his life took sufficient strychnine to cause death, and that his death was caused by that poison. I never saw any natural disease cause symptoms similar to those in the present case, nor do I know of any natural disease that could cause them.

Cross-examined.—The symptoms I have heard described indicate to me, apart from the analysis, poisoning by strychnine. I never was present at the death of a human being from the effects of strychnine. I myself poisoned a small dog with strychnine. I did not weigh the dose.—The dog died in about two minutes, the symptoms became apparent about a minute after I administered the poison. The action of strychnine is not instantaneous upon reaching the stomach, it generally operates at an interval of from half an hour to two hours after being swallowed. A large dose might perhaps act more rapidly than a small one, but the size of the dose, as a rule, should make little difference in the time required to produce symptoms of poisoning. This poison would act quicker given dissolved in some liquid than if incorporated with a solid substance. Strychnine is easier dissolved in warm fluids or in alcohol than in other liquid. One grain of strychnine would give a bitter taste to three gallons of water *i. e.*, to a volume of water of 100,000 times its own bulk. There are four hundred and eighty grains in an ounce. The dose to cause death would be from half a grain to five grains; strychnine is absorbed in the blood and tissues, and unless death supervene is eliminated from the system with the other secretions. Strychnine is composed of oxygen, hydrogen, nitrogen and carbon, which are also the principal elements of animal tissues, but in different proportions. I found my opinion concerning the symptoms, upon what I have read. The absorption of the poison commences at once, sometimes a small quantity is absorbed quicker than a large one. In a great many poisons the absorption of part of a strong dose might cause death and the remainder would then be found in the stomach. After the first manifestations of poisoning, any one who has taken strychnine either soon dies or gets better. It is not only in poisoning by strychnine that nervous twitchings are observed. I have read of cases of poisoning by strychnine where the face became placid after death. Nearly all authors agree in stating that the rigidity of the limbs caused by the last spasms continue after death, but this is not always the case: from rigidity of limbs alone

I should not infer poisoning by strychnine as there are other diseases which cause it. Clenching of the teeth is not a constant symptom although it generally exists during the spasms, once the spasm ceases the jaw resumes its laxity. There are many diseases which cause the same symptom. Poisoning by strychnine produces a contraction of the respiratory muscles respiration during the spasms becomes completely suspended and the difficulty of breathing increases with each succeeding attack: difficulty of breathing is not necessarily an indication of poisoning. In poisoning by strychnine the eye is prominent, but the pupil is not dilated. A very general symptom is a pain in the pit of the stomach, which is due to contraction of the diaphragm. Contraction of the extremities is not a certain indication of poisoning by strychnine as it is met with in other cases. In poisoning by strychnine, the poison is carried to the nervous centres, (the brain and spinal marrow) by the circulation, which takes from a minute to a minute and a half. The spasms generally last from one to two minutes: there are intervals between the spasms: there is a muscular trembling which resembles a shiver, before the spasm. The symptoms of poisoning by mushrooms do not resemble those of strychnism. I have read the symptoms of *trichina spiralis*: it is a disease caused by eating pork, infected with an animalcula of that name; convulsions are not a necessary symptom of death from that disease. The symptoms observed in deceased are not the same as those of angina pectoris though there are sometimes convulsions in this disease. My conclusions as to the cause of deceased's death are based upon all the symptoms manifested since the 22nd December. I understood the witnesses to say that in the last illness the head was convulsively thrown back, that the extremities were contracted, that a strong pressure on the thorax relieved the patient, that there was no loss of consciousness and that after the spasm the muscles resumed their usual state. That there was no delirium, that the patient complained of great pain in the epigastric region and of pain and weakness in the legs, that any noise caused him to start and that he was conscious of the approach of a fresh spasm and also predicted his approaching death. Angina pectoris caused by hydrothorax reveals itself suddenly and has the same effects as when caused by anything else with the exception that some symptoms of hydrothorax may be mingled with them. The chief characteristic of the disease is great pain behind the sternum. The symptoms you have just described might be caused by strychnism and might also be caused by Angina Pectoris with the exception of bending back of the body, which would I think sooner be bent forward. I cannot say that those symptoms cannot possibly belong to any other disease. They much resemble the symptoms described by the witnesses with the exception that some of them have not been mentioned. The irregularity of the pulse and the feeling of inexpressible agony were not mentioned by the witnesses: I heard them say that deceased was in pain and thought he was dying, but that is not what I should call inexpressible agony. I could not confound the symptoms described with those of angina pectoris, even supposing I had known nothing of the case before the trial. I know of no pathological lesions existing in the body of deceased. I find in the thorax lesions that may have been caused by death from asphyxia. The effusion of blood in the pleura may have been caused by death from asphyxia. In anasarca, after death, a quantity of serum escapes, and anasarca is an indication of chronic disease. Accord

to the report there were black spots in the mucus of the stomach, but there was no appearance of gangrene having supervened. These spots indicated an inflammation of the mucus membrane of the stomach. I do not think that the inflammation had existed long, chronic gastritis might produce the indications observed in the stomach, but there is generally a thickening of the mucus membrane. It is a nervous disease: it is a spasm of the stomach, which does not generally produce cramps; the pain often comes on at intervals. I can base no diagnostic fact of the brain being congested as it exists in so many diseases: people dying of a tetanic disease have this symptom. I cannot form an opinion as to the cause of effusion of blood in the pericardium taken by itself: it is not a sign of dropsy of the heart because the effusion in that case would be of serum and not of blood. The putrefaction of the intestines as described in the report is in my opinion due to post mortem decomposition. I performed some of my experiments on the mucus alone, but I repeated them in presence of Dr. Bru-
neau, some of them were also made in presence of the coroner. I am certain that the reagents I used were pure. The colors mentioned are produced by strychnine alone, if I except a South American poison called curara, that poison produces the same series of colours, but there is none of it in this country. As to the authors who do not believe in the colour test, I will believe them when they show me anything else that will produce the same series; until such time nothing will shake my conviction that the test is an infallible one—curara always excepted; absorption does not decompose strychnine, nor is it decomposed by the secretions. Chemists have sometimes failed to discover strychnine which existed in organic matters. I know that chemists report having applied the color test in vain, where strychnine had been ingested, but I have succeeded every time I have tried the experiment. I never was a professor of either chemistry or toxicology. I did not say that I had found strychnine in crystal in operating upon the duodenum and the mucus of the stomach, I have not any of the results of my experiments here. In the experiments upon the duodenum, the colours were well defined. I do not consider the bitter taste alone a certain indication of the presence of strychnine, I do not attach very great value to it, although it has its weight. The second method I employed is one that is well known but which has received no name, it emanates from Drs. Rodgers and Girdwood, I do not know whether it has ever been judicially proved. I see in Palmer's case that the inventors of this method cite in support of their views, many experiments that they have made with it. I repeat that the colour test is a sufficient proof of the presence of strychnine without anything else. The result of my experiments does not enable me to calculate the quantity of strychnine that would be contained in the whole body. I cannot say whether every part of the body would contain an equal quantity of strychnine. I forgot to mention as being amongst the symptoms described, that any noise or the slightest touch of the patient produced tetanic convulsions. The clenching of the hands and bending down of the toes are symptoms of strychnism and also of tetanus. There is no natural disease, excepting perhaps tetanus in which cadaveric rigidity would exist so soon after death as reported in this case. No one symptom is sufficient to lead to a conclusion of poisoning, you want a combination of symptoms. The pains experienced in angina pectoris and in strychnism are not of the same character. In angina pectoris, it is more than a pain, it is agony, and the seat of it is in the middle of the sternum.

whereas in strychnism it is in the epigastric region. In poisoning by strychnine the difficulty of breathing only exists during the spasms, whilst in angina pectoris caused by hydrothorax the oppression is continuous. During the tetanic convulsions respiration is completely suspended. In poisoning by strychnine there is a tetanic rigidity which first begins at the extremities and is afterwards communicated to the trunk, face and neck. In poisoning by strychnine not only is the body bent back, but the head is bent back also and forms an arch from head to heels, which are the only things on which the body rests. The jaws are convulsively locked and the corners of the mouth drawn back. None of these symptoms are those of angina pectoris caused by hydrothorax. Pains in the legs are not symptoms of angina pectoris caused by hydrothorax. There are no convulsions in this disease nor is there locking of the jaws. It is possible that in angina pectoris the face might become blueish or black, this would be caused by suffocation. If the convulsions that are described as having attacked the deceased at Cajollette's on the 22nd Dec., had been brought on by angina pectoris caused by hydrothorax, the deceased would not have been able to go to the wood that morning, nor would he have been able to work at a threshing mill for three days previous. Arsenic would not produce convulsions, there would be frequent vomiting and diarrhoea. There is no natural disease that has the same combination of symptoms as those observed in poisoning by strychnine. I know of no natural disease that has the same symptoms as those remarked from the 22nd to the 31st with intervals of relapse. I never saw any curara. In analysing the duodenum I adopted the process of Rodgers and Girdwood having seen it previously worked. In this process hydrochloric acid and chloroform are substituted for tartaric acid and ether which are used in Stass, process. Operating upon small quantities I think this process is preferable to Stass. Since the analysis I have used Rodgers' and Girdwood's method with success: it was by this process that I proved the presence of strychnine in the pellet of grease. I am still of opinion that death was caused by strychnine.

DR. PIERRE, C. A. BRUNEAU.—I assisted Dr. Provost, the last witness in the analysis of the duodenum and of the mucus of the stomach, and of a morphine powder, and six powders of carbonate of iron and of magnesia, which had all been placed in our hands by the Coroner. I signed the report and I perfectly agree with Dr. Provost in the evidence he has given. From all the evidence given in relation to symptoms in deceased's illness, and from the result of the analysis I made; I can attribute death to no other cause than poisoning by strychnine.

Cross-examined:—The bitterness of strychnine is greater than an ordinary bitter; in my opinion a grain of strychnine dissolved in a pint of water or alcoholic liquor would give it an unbearably bitter taste, but I never tried it. I heard the report of the autopsy made by Dr. Ladouceur; I should attribute the effusion of blood found by Dr. Ladouceur, in the pericardium to cadaveric putrefaction. This effusion, even if there were congestion, would not of itself be a proof of any organic disease. The heart's being dilated in its auricles and ventricles, and being of a darker colour than is natural are not in themselves proof of organic disease. Asphyxia might have caused these symptoms. The effusion of blood in the pleura does not necessarily indicate organic disease. This effusion could not take place without a rupture, but the rupture may have

been caused after death by decomposition of the tissues. Congestion of the brain is met with after death in many diseases. A much congested liver, full of black blood may be an indication of organic disease, but does not necessarily lead to such a supposition. An organic disease might cause sudden death. The injection of the kidney with black blood, and the dilatation of the spleen with the same substance are not symptoms of any particular disease, and might occur in ordinary or non-organic diseases just as well as in a disease which caused a violent death. The coating of thick black mucus on the surface of the stomach is common to many diseases, and indicates a lesion of the organs preceding death. In most cases cadaveric decomposition commences within twenty-four hours. The violet tints of the stomach are not always indications of inflammation of that organ. After death, the gastric juices which are in the stomach, often produce this discoloration, owing to their acquiring certain properties which they had not during life and also owing to the stomach having lost the powers of vital resistance. The black spots may have been owing to a stagnation of blood, and to the action of the gastric juices; this is often noticed combined with other symptoms which may be an indication of inflammation. I cannot say whether all the elements which compose strychnine, exist in the fibrine of the blood. Bichromate of potash is not coloured by sulphuric acid alone being added to it. I consider the colour test is infallible as a proof of the presence of strychnine. Lassitude of the limbs does not always accompany poisoning by strychnine. When the stomach is the seat of a disease, the last moments are sometimes accompanied with nervous tremblings and contraction of the face. The convulsions in poisoning by strychnine stop respiration and cause asphyxia which may cause death. The respiration is completely suspended in the paroxysm of the convulsion only. It is the muscles of the body becoming greatly contracted which causes the difficulty of breathing. Idiopathic tetanus comes on without any appreciable cause, great cold may cause this tetanus as also strong emotions; some authors have attributed idiopathic tetanus to the injection of certain substances. There are some who pretend that strychnine is decomposed by absorption into the blood and that it also changes the character of the blood. This question is not yet scientifically settled. I never saw a case of idiopathic tetanus; these cases are very rare, so much so, that one of the most eminent physicians of England, states that he has only met with one case of it.

To the Court.—Deceased may have died from poisoning by strychnine, and the body presents all the appearances described in Dr. Ladouceur's report of the autopsy.

DR. ROCH, M. S. MIGNEAULT.—I heard the evidence which has been given in this case, including that of Dr. Provost. I helped Dr. Provost to analyse a pellet of grease, which contained strychnine, an arsenic powder and a powder of sulphate of magnesia. I was present at the analysis of the contents of the stomach of deceased, I saw the result of the mucus and also the experiment made by Dr. Girdwood. I corroborate Dr. Provost's evidence concerning the analysis we performed together, and I certify as to the regularity of the proceedings and results produced. I saw the result of the analysis of the mucus of the stomach which was made by Dr. Provost, and I also saw the series of colours which were produced. This series of colors denotes the presence of strychnine.

The process made use of by Dr. Girdwood in treating the stomach was new to me in as far as the use of hydrochloric acid and chloroform were concerned, and I paid particular attention to it. From the evidence which relates to symptoms observed in the different illnesses described, together with the reports of the autopsy and chemical analysis, I can attribute deceased's death to no other cause than poisoning by strychnine. I never, in the course of my professional studies, learned that idiopathic tetanus produced intermittent convulsions, with intervals as well marked as in this case. I do not remember having ever heard of idiopathic tetanus in America. From what I have read, authors in speaking of cases of idiopathic tetanus, only mention having met with one or two cases amongst all the tetanus cases treated by them. Idiopathic tetanus would not present all the symptoms observed in the deceased. In the course of my practice I have met with three cases of traumatic tetanus. There are several symptoms which are common to traumatic tetanus and to strychnine, but there are in deceased's case many symptoms which are not met with in traumatic tetanus. I should define traumatic tetanus as being caused by an exterior wound, whilst idiopathic tetanus has no apparent cause, and might be called constitutional. Idiopathic tetanus might leave the organs in the state described in the report of the autopsy. In case of death caused by hydrothorax, I do not think the patient would be able to go a journey a few hours before death. An effusion of bloody serum in the pleura might be mistaken for an effusion of blood and might be caused by hydrothorax or other things. An effusion of blood in the pleura is not a sign of hydrothorax and could not be caused by it, hydrothorax is vulgarly called water on the stomach.

Cross-examined :—There are certain organic diseases where the symptoms might be modified by another disease; there are others which always produce the same symptoms. There might be inflammation of the lungs and liver together with a lesion of the heart. Inflammation of the lungs could not exist with pericarditis. The simultaneous existence of several morbid causes in the organism may complicate the symptoms of the principle disease by presenting besides others that were foreign to it, but that disease would nevertheless retain all the symptoms that are peculiar to it. Angina pectoris comes on suddenly. A man suffering from hydrothorax might attend to his affairs during certain periods of the illness. To cause angina pectoris, hydrothorax must be in a very advanced stage. A man suffering from hydrothorax might be able to go out in a carriage in the morning, and in the evening be attacked by angina pectoris and die. What I mean by attending to his business, is performing the work appertaining to his state in life. The dose of strychnine which caused the illness of the 22nd December, could not be the same as that which caused death on the 31st. A dose of strychnine having produced convulsive spasms, could not, after an intermission of six hours reproduce them and bring on fresh spasms.

To the Court.—My opinion is that strychnine was taken on the 22nd, 24th, 29th, and 31st. When arsenic has been taken, it is I think, always discovered in the analysis; being a mineral it is not eliminated from the system so easily as strychnine—but if it has been taken in sufficient quantities to create a morbid affection, its presence will be revealed by the chemical analysis, never mind what quantity had been thrown up in vomiting. I am still of the same opinion that I was, namely that deceased died of poisoning by strychnine.

GILBERT PROUT GIRDWOOD, physician and surgeon, being sworn, saith :—I do not understand the French language ; I have been present and heard the testimony given by the witnesses for the Crown ; I did not understand them, but have read the testimony as translated into English by Mr. J. G. Johnson.

Mr. ARMSTRONG, on the part of the Crown, said he desired to ask the witness his opinion of the symptoms noticed in deceased as described by the former witnesses.

Mr. CHAPLEAU, for the defence, objected to this evidence, as the witness did not understand the French language.

Mr. ARMSTRONG proposed to swear Mr. Johnson as to the correctness of his translation.

This was acceded to by the defence.

JAMES G. JOHNSON, gentleman, of Montreal, being duly sworn, said that the translation of the previous witnesses made by him from the French into the English language, and read by Dr. Girdwood, was a faithful translation.

By consent of the defence, the witness, Dr. Girdwood, was then heard, and he deposed as follows :

From the symptoms described by the previous witnesses, I have come to the conclusion that the deceased died of poisoning by strychnine. I have formed this opinion on the symptoms described by Marie Plourde, Dr. Ladouceur, Michael Lemaire, the Rev. Luc Trahan, and Joseph Joutras. These symptoms are not compatible with death caused by cholera, nor by convulsions nor epilepsy, nor by tetanus, whether idiopathic or traumatic ; nor by inflammation of the brain or spinal cord, nor by hydrothorax, nor by angina pectoris. The fullness of the pulse is incompatible with death arising from angina pectoris. In angina pectoris the pulse is weak. The symptoms described are incompatible with death caused by poisoning with mushrooms. In all cases of poisoning by strychnine, if death is the result, we are able to discover traces of the poison in the body, if we employ the proper mode of analysis. When strychnine is absorbed into the body, it is not decomposed ; it may be thrown out of the body, or eliminated in the same state in which it entered the body. It can be discovered even a year afterwards. I can demonstrate the presence of strychnine with sulphuric acid and bi-chromate of potassa, with sulphuric acid and binoxide of manganese, with sulphuric acid and binoxide of lead, with sulphuric acid and fero-cyanide of potassium, or with sulphuric acid and a stream of electricity. There is no substance known which, under the same circumstances, gives, with these reagents, the same series of colours, except strychnine. Proof of the existence of strychnine, by the colour test, may be disguised by the presence of organic matter. This can be prevented by destroying the organic matter by means of concentrated sulphuric acid. I examined my chemical reagents, to prove their purity—that is to say, to prove that there was no strychnine in them. In examining organic matter for the presence of strychnine, I adopt a process of my own. This process was first published in the *London Times* in 1856, about the time of the trial of William Palmer : it also appeared in the *London Lancet*, and the *Pharmaceutical Journal*. There are cases published in which this process was employed. The only case in which I heard of symptoms existing identical with this case was that of a Mrs. Dove ; she died of poisoning by strychnine. I arrived at Sorel on the 7th

February last, at the request of Mr. Armstrong, to make an analysis in this and in another case. On the following day, the 8th, I went with Mr. Armstrong to the residence of the Coroner, Dr. Turcotte, there I heard some of the evidence taken at the inquest. I then went to the residence of Dr. Provost, and found him, in company with Dr. Mignault, making an analysis of a portion of the viscera, which they informed me had been taken from the deceased, F. X. Joutras. I asked them what process they had adopted; Dr. Provost replied that he was employing the process of Staas; he gave me the stomach after having first emptied its contents. I cut it into pieces with the assistance of Drs. Migneault and Provost, placed it in a new capsule, and covered it with dilute hydrochloric acid. I applied heat by means of a water-bath, and kept up the heat till the whole stomach was dissolved. This was then put aside to cool, and then passed through a wet filter. I agitated the clear filtered liquid with sulphate of magnesia and ammonia, and again filtered the solution. To this solution I added about one ounce of chloroform and shook them well up in a bottle, I separated a portion of the chloroform and evaporated it to dryness on a clean porcelain capsule. This residue I tested for strychnine, and I was convinced of its presence, nevertheless there still remained some organic matter. I then removed the rest of the chloroform from the mixture, and evaporated it to dryness. To the residue obtained after the evaporation of the chloroform, I added sulphuric acid and applied heat for some time so as to destroy all trace of organic matter, this was filtered after being diluted with water, so as to separate the carbon. The clear filtered fluid was neutralized with ammonia and again agitated with chloroform. This chloroform was evaporated and on being tested yielded strychnine in abundance. Dr. Provost gave me also a gall bladder which he said belonged to the body of François Xavier Joutras. The gall bladder was tied with pack thread and contained a small quantity of bile. There was less than one ounce in weight and it was treated by the same process just described as with regard to the stomach. I again proved the presence of strychnine, I called Drs. Provost and Migneault to witness the test for strychnine in both cases, I also saw the proof of the presence of strychnine in the contents of the stomach which was treated by Dr. Provost. Dr. Provost gave me a white powder which he had proved to be sulphate of magnesia. I also examined this and proved it to be sulphate of magnesia, he also gave me another powder which he stated, he had proved to be arsenic. I also examined it and corroborated his statement. Dr. Provost afterwards gave me a small ball of grease covered on the outside with dust, this was cut into two by Dr. Migneault, and contained a white powder which was proved to be strychnine. From these analyses, I concluded that the deceased swallowed strychnine before his death and lived long enough afterwards to allow the strychnine to be absorbed into the blood, and to circulate in the system, and to be carried to the liver and excreted in the bile, these are my conclusions.

Cross-questioned.—I have not the sample of strychnine here that was found in the pellet of grease. The small glass capsule here produced appears to be the same that I used, but as I have not had charge of it I can not swear it is the same. The analyses were conducted with new apparatus brought from Montreal by me. The analysis of Mrs. Dove's body was not made in my presence. I proceeded at once to the analysis after receiving the viscera from Dr. Provost,

the process was continued without interruption to the end, it was about half past ten a.m., when I commenced and I finished before sun down. I speak about my process on the stomach, I think I examined the gall bladder the following day. I left everything with Dr. Provost except my apparatus. I did not make any physiological test of the contents of the stomach, except by tasting it, and I then found it bitter. I would have done so, but at this season of the year it is impossible to obtain a frog. The yellow substance on the glass capsule produced is organic matter. It takes about twenty seconds to pass strychnine from the stomach to the urine and I think about the same time to absorb and carry it to the gall bladder. I have never seen a case of idiopathic tetanus, but I have seen several cases of traumatic tetanus. Whilst the trial of Palmer was going on, Mr. Rodgers and myself had not yet completed the process which we discovered for the detection of strychnine, it was only completed by us after he had given his evidence at that trial. It is the series of colours, blue, violet, purple, and red, which prove the presence of strychnine. I have examined more than 200 human bodies and never before met with the same series of colours. I have often obtained strychnine from the bodies of animals, but have never before had the opportunity in the human subject. I have discovered it in the urine of persons taking it medicinally, I have in these cases found the same series of colours. In the trial of Palmer, Dr. Taylor asserted that the presence of strychnine could not assuredly be detected. It was in consequence of this statement that Mr. Rodgers and myself set to work to discover a process by which it could always be detected, and the result of these experiments was the discovery of the process, I have described. Although there are persons who deny that the colour test will prove the presence of strychnine, there are none who deny, that when the series of colours are produced under these circumstances, that they are not evidence of strychnine. I consider that it is a point undisputed in medicine, that this series of colours thus produced is a certain indication of the presence of strychnine. Where arsenic has been absorbed in the body you may discover all that has not been eliminated, arsenic is eliminated like strychnine. As a general rule nature tries to get rid of poisons as soon as possible.

Re-examined:—When Dr. Taylor at the trial of Palmer, said that other substances could produce the same colours, it only showed that he did not know what he was talking about, as these colours are not produced by other substances under the same circumstances.

This closed the case for the crown.

Note.—We will give the medical testimony taken on the defence in the next number of the journal.

It is with sincere pleasure we announce that our worthy old friend and fellow-student, George Duncan Gibb, A.M., M.D., L.L.D., has succeeded to the baronetcy of Gibb, of Falkland Fife. Sir George D. Gibb is at present physician to the Westminster Hospital, and lecturer on Forensic Medicine. There has just issued from the London press the second edition of his work on the Laryngoscope.