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ORIGINAL COMMUNICATIONS.

ART. XXI.—*On the Philosophy of Respiration and the Pneometer.* Thesis defended before the Medical Faculty of the McGill University. By G. S. De Bonald; for the degree of M. D., C. M.

1. The study of the respiratory apparatus has not, to the present day, been the subject of a closer attention than that of the other functions of the animal economy. It has even been placed, as to importance, by some authors, after the Nervous centre, the Circulation, Digestion &c.; and the morbid changes, which it undergoes under the influence of causes which are exclusively peculiar to it, have been oftentimes considered as consecutive symptoms of pathological modifications existing in other organs. Thus, it is said that Dyspnœa, Pneumonia, Pleurisy, Bronchitis, Pulmonary Apoplexy, &c., are frequently the *effects* of an organic affection of the heart, acting as the primary cause. It is also said that Bright's disease, affections of the liver, of the spleen, &c., &c., produce more or less serious alterations of the organs of Respiration; diseases of the encephalon, spinal marrow &c., are likewise called upon to furnish their quantum of disorder to the respiratory system. So that, all diseases, sporadic, idiopathic, epidemic, endemic, nay traumatic, conspire, more or less, against the integrity of the function of Respiration.

Let us try and demonstrate that, as Respiration is the origin of life and health, so it is also of disease and death.

2. Since we make Respiration the foundation of our pathological edifice, we have to consider it, I. In its normal condition or state of integrity with all its accompanying circumstances; II. In its diseased or disordered state with all the modifications which it produces in the economy.

Let us first consider a man, respiring pure air. We have to examine him under three different conditions:

I. He respires enough.
II. He does not respire enough.
III. He does not respire properly.

Before passing to the consideration of the first condition, we will give, in a few words, a description of the mechanism of Respiration. The circular fibres,

by their alternate dilatations and contractions increase or diminish the caliber of the Bronchial tubes; the longitudinal ones, by the same play, lengthen or shorten the same tubes, and the combined action of the two sets of fibres enlarges or reduces the capacity of the tubes. It is very well known that the capacity of a tube or cylinder is the product of its base multiplied by its height or length; and if not a perfect cylinder geometry gives us the means of estimating its capacity.

The expiration of carbonic acid is not a *vital action.* We use that expression in the sense of *inexplicable;* because some men, too presumptuous to own their ignorance of a fact which they cannot explain, shield themselves too often behind this too elastic expression; "*it is a vital action.*" The expiration of carbonic acid is a phenomenon under the influence of the common laws of Physics. What do we observe during both inspiration and expiration? To understand well this process we must first consider the Respiratory system in a state of *rest,* where there is neither dilatation nor contraction. That state, it is true, does not exist during life; but we may conceive it to exist, as well as we may conceive that the square root of 1 is less than the unit, although we have no mathematical means to demonstrate it.

5. When it pleased God to embody the soul, he took matter, blew into it the breath of life, and it was made the first man (Genesis.)

At the same instant, air rushed into his lungs with a force and a volume admirably calculated to overcome the resistance of the pulmonary tissue, but without transcending its expansive force. This first volume of air was destined to serve as *point d'appui* to the parenchyma of the lung which was thereby enabled to return or contract to produce a reaction, not equal to the action of the first volume of air, whose force was necessarily greater than the resistance of the pulmonary tissue, but equal to the dilating force of the tissue minus the resistance of the volume of air which serves as *point d'appui.* If, by a mechanism contrary to the laws of motion, the lungs could *expire* the whole mass of air *inspired,* life would consist of but one *inspiration* and *expiration.* Reaction then acts on a mass of air inferior to the mass *inspired,* and this may be taken as the explanation of the fact, that in children and even healthy adults, the act of *inspiration* is longer than that of *expiration.* All deviations from this rhythm of the Respiration should be carefully noted by the competent observer, because they are certain indications of pathological modifications in the system.

6. The mass of air expired, almost entirely composed of carbonic acid, is the result of the combustion which is henceforth to be kept up in the body, as long as life animates matter. This gas is heavier than atmospheric air. But why, will be asked, is it that the expired air should consist entirely of carbonic acid? Without having recourse to *vitality* or *inexplicability,* we may thus resolve the question. I. The *momentum* of a body is equal to its own weight multiplied by the *impulsion:* II. When two bodies of different specific gravities are submitted to, or receive, the same impulsion, the heaviest places itself before the other (see Treatises on Physic); the carbonic acid must then be expelled the first, and that expulsion exhausts, at the same time, the force of

return or contraction of the pulmonary tissue, and the force of dilatation, which is antagonistic to contraction, resumes its action, and allows a new mass of air to be introduced into the lungs; this air, modified by the combustion, is again expelled, and so is perpetuated the function of Respiration, and life maintained.

7. Respiration exerts no direct action on the thoracic muscles; the Brain, centre of intellect, whose integrity is dependent on Respiration, presides over the continuance and harmony of the movements commenced by the Respiration.

The circulation is not less dependent on Respiration than the nervous system. The immediate cause of Circulation is animal heat, which is itself the product of Respiration. The limits of this thesis do not permit me to speculate on the starting point of the Circulation, and although this point of Physiology has been very little investigated, we will not touch it, but simply say that Respiration is Life; that Life rests on a tripod: I. the Nervous Centre by which it manifests its *being;* II. the circulation by which it assumes forms; and III. Digestion by which it is perpetuated: and it is as impossible to render Respiration evident without this tripod as it is to form a plane without three points; and although these four functions are intimately connected, and essentially dependent upon one another, still they have not a simultaneous commencement. Respiration precedes the three others.

8. It is true that when *breathing* begins to animate a body, the organs of the other functions already exist. But there is no difference between them and common matter, except a peculiar arrangement of their molecules relative to the mode of existence which they are required to render manifest.

For instance, let us consider the fœtus just separated from its mother; let us seize the interval which separates the cessation of the supply of maternal blood from the instant it begins an independent Respiration; what does it possess? Nothing. The fœtus lies as inert matter, as long as breathing has not established or excited the other functions. It remains yet to be proved whether or not the *soul* exists in the fœtus *intra uterum*. Philosophers, theologists, and legists have never agreed on that point.

9. Since respiration is life manifested by a series of actions and reactions, the study of its mechanism in the two states of health and disease becomes of extreme importance in the etiology of diseases, as well as in the indications for the restoration of health.

10. A man respiring pure air, presents himself to our examination under three different conditions. I. *He respires enough.* What standard of comparison shall we adopt? A perfect state of health, that is to say, a state in which the functions of the body are executed in the most complete manner? But what are the conditions in which the system is to be found so that the effects of the respiratory process shall be recognised throughout the body? Why should a well developed constitution be in perfect harmony with the integrity of the respiratory apparatus? We insist on this point, because, out of a hundred well developed subjects, taken at random, there are perhaps not five entirely alike. Hence the necessity of determining the exact measure of respiratory capacity appertaining exclusively to each constitution; hence also the sure indications for maintaining the integrity of health. Voluminous works have

been written on hygiene containing general rules for the preservation of health, but these rules are all the same, or nearly so for all; and it is as impossible to restrict every constitution to the same regimen, as it is to exact from all men indiscriminately the same amount of work during the same space of time. Every one wishes to write books; but most writers, instead of thinking ten times more than they write, write ten times more than they reflect! the consequence is, that most of these hygienic precepts produce disastrous effects on the economy. Thus, exercise is looked upon as the *palladium* of health; but no means are given to determine its limits from the power of respiration inherent to each constitution. What happens then? A man with only one spark of life remaining, imagining that the more exercise he takes, the more vigor he will obtain, starts off, hunting, &c., doubling, trebling the work of a thoroughly robust man; he makes superhuman efforts to overtake his idol, but in vain; the goddess flees from him at a light and rapid pace. The combustion, which he has set up in his body by a too violent exercise and too accelerated respiration, destroys the remains of his strength, and compels him to give up his pursuit. He presents then to the eye the aspect of a body deprived of the combustible principle, still susceptible of emanating a faint degree of heat under the influence of an abundant source of borrowed caloric, but incapable, by itself, to generate and maintain it. If one of the three fatal sisters (Parcæ) does not cut off suddenly the thread of his life, he lingers out a feeble existence in the pangs of a tumultuous circulation which can no longer retrieve its former regularity.

"Better to rush at once to shades below
Than *linger* life away, and nourish woe."

Organic diseases of the heart, so frequent at the present time, may generally be traced to the foregoing cause.

11. After the constitution comes animal heat, which should also be in harmony with the force of the normal respiration. Under its influence the mind manifests agreeably its conceptions, and the will is transmitted to the limits of the capacities of our nature.

The animal heat and the nervous centre impart to the circulating fluid a movement regulated by a rhythm of dilatation and contraction in the vessels which contain it.

Thus rolling in a continual circle, the stream of life successively brings to every tissue its tribute of materials for the repair of waste.

12. Thirdly, what we call for convenience sake exercise, or work, &c., &c., is not less essential to the maintenance of health.

Exercise accelerates respiration; respiration increases animal heat; which in its turn excites the nervous system to a more active manifestation of its functions. The circulation, which is dependent on respiration and animal heat, becomes more rapid, and ultimately, assimilation and elimination are carried on in a more energetic and complete manner. But the extent of this exercise must be rigorously subordinated to the development of the constitution, and the degree of respiratory capacity. Any deviation in this respect, however slight it may be, will more or less interfere with the condition of health.

Of two constitutions equally sound but unequally strong, the strongest will require the greatest amount of exercise. Two levers whose arms are unequal will have, to establish an equilibrium, to describe unequal curves.

13. The appreciation of the force of respiration is not so difficult to determine as might generally be imagined; and the physician who perceives its importance and the manner of determining it, can prognosticate with a quasi-certitude, the duration of life of each constitution.

Without heeding the recriminations of the inexorable fatalist, or the doubts of the indifferent sceptic, we shall presently prove not only that our days are counted, but that we are at liberty to shorten their duration.

The instinct of self-preservation which is innate in man renders life dear to him, and makes him adopt every device to prolong it. The sick man adheres to life by the hope of a return to health, and the healthy man aspires to the continuance of his actual well-being.

The indications to attain that condition are not numerous. They consist:—

I. In deviating as little as possible from the laws of nature.

> "Cédons, conformons-nous aux lois de la nature;
> La route qu'elle trace est toujours la plus sûre."

II. In observing the precepts of morality, which, well interpreted and understood, give us the best and simplest hygienic rules. III. In placing confidence in the enlightened physician, whose experience and correct judgment enable him to appreciate with exactitude the force of vital capacity inherent in each constitution. The first and second indications, being more social than medical, will not be here touched upon. I will therefore confine myself within the limits of the third. I will have an opportunity of developing, in a more advanced part of my subject, the means which I consider the best adapted for determining the force of the respiratory apparatus, and point out the modifications induced by a pathological state.

14. *Second consideration. Man not respiring enough of air.* We have to examine him here under three different conditions:

I. From want of exercise.
II. From insufficient quantity of air.
III. From congenital defects of the constitution.

I. A healthy man, well developed, who does not go through every day an amount of work or exercise consonant with the strength of his constitution, will soon experience a disturbance in his health. As the effects of the respiratory process are experienced throughout the system, so in order to maintain an equilibrium of action, the latter must necessarily undergo a corresponding change; but if it remains inactive in one or more of its parts, the effects of the action can no longer reach their full development; and the result is a rupture of the general equilibrium whose immediate consequence is a reduction in the force of the respiratory apparatus. Animal heat, circulation and nervous influence are thereby secondarily modified and their action becomes unequally distributed. We need not add that unequal circulation will produce local congestions with the various disorders which are connected with it.

15. It is the nature of our organization easily to habituate itself to a perverted state of the system. Thus,while the destruction of the equilibrium deprives some organs of part of their energy and surcharges others, the latter become hypertrophied and the former atrophied; still both tend to the same end, *exhaustion:* the latter from want of action and the former from excess of action. Chronic diseases may find here a starting point.

16. The second division of the second consideration is: man not respiring enough from want of air. In this case we may find him in one of the two following conditions:—I. State of inactivity; II. State of great activity or furnishing the greatest amount of work which his constitution is capable of.

We can easily conceive that in the first case the morbid changes which the system will undergo, will be slow in their progress, and will assume the asthenic type during the whole period of their duration; whereas in the second case the respiratory apparatus, requiring a great mass of air for each inspiration, will have to reintroduce, into the system, with the insufficient quantity of pure air which it has at its disposal, a large volume of the vitiated air which it had expired; hence violent cerebral and pulmonary congestions.

17. In the third division of the second consideration we have to examine man not respiring enough from congenital malformation.

In this class may be enumerated the greatest number of subjects. Diathesis and predispositions are the sad appanage of these defective constitutions.

Offsprings of impure connection, or belonging to etiolated parents, these unfortunate beings present us all the varieties of constitution which deviate from the normal type. Thus alongside with a colossal and disproportioned stature, we will find the *cretin* whose existence is nothing more than vegetative.

It is to be observed that in these unfortunate beings the respiratory apparatus is deficient; animal heat lessened; and the circulation unequal. Still they reproduce, multiply and even people whole localities: Legislators, philanthropists and moralists do little or nothing to prevent that invading degeneration; on the contrary, it would seem that the present refinement of manner and civilisation have perverted *moral sense* to such an extreme, that the ideal of the human species, has become nothing more than a delicately framed body, with the pallor of marble, a scarcely perceptible respiration and problematic vigour.

It is true that sanitary improvements are beginning to be introduced among the centres of population. Thus the streets are made broader, dwellings are constructed more spacious and better aired; but should not alliances between infirm and degenerated individuals be prevented, as well as marriages between consanguineous parties; and should not restrictions be imposed upon fashion, instead of permitting it to destroy the most promising constitutions and shorten the dearest lives.

18. There was a time when great ladies considered themselves honored by giving birth to liliputians. The wife of *Charlemagne*, king of France considered herself entitled to the highest honour because she conceived and brought into the world a dwarf smaller and uglier than all others. These hideous beings, shocking specimens of the human species, lived for no other purpose than to

amuse the leisure of the great, by either their grimaces or stupidity. Jockeys and little grooms were afterwards an improved modification of that type.

19. Man, forgetting himself thus, still presents for meditation a point of deep philosophy. It was thus that in remote times as the centres of population were getting denser and more compact, two classes of men became formed: the one, composed of strong, robust and powerful men, superior to others by their moral and intellectual endowments as well as by their physical capacities. This was the Nobility or Noblesse; and if as such, it had traversed ages, it would still be the honor and glory of society. The other class was composed of all kinds of degenerated people, resulting either from impure connections or errors of education.

These two classes bore different denominations according to the epochs. In the time of our Saviour there were the Pharisees and the Publicans; under the Romans there were the Patricians and the Plebeians; and in more modern times we had the Noblesse and the Roture (nobles and commoners.) The one of these two classes grew proud and disdainful; the other, vilified and abject, had no other *reason of being* than slavery and servitude. The first class did not always keep up the prestige of its noble feelings; it gradually lost its influence; whereas the second class began to refine itself. From its bosom sprung, at intervals, sparks of intellect which cast in the shade the upper class. Christianity came to teach men that they had but a common origin and that before God there was no inequality.

20. These great truths for a long time violently convulsed society; but at last, calm was established and every one could breathe at liberty and express his feelings.

We must not confound equality before God with *absolute equality* between men; the first is the basis of our religion, and the second is an *utopia.*

Intellectual inequality is an essential condition of the existence of man on this globe. It must constantly contribute to the general welfare of society. Without it there is no improvement possible. If every man owes something to the promotion of general improvement, there is one whose position and education enable him to contribute the largest share in mitigating the miseries of this life, as well as in the promotion of its comforts. It is the *medical man.*

21. The mission of the physician being the most extensive and the most fruitful in its results (without prejudice to the minister of religion) implies necessarily aptitudes not less limited. He should not confine himself to the expectation of disease in order to oppose his art, but he should also prevent its occurrence by all the means which intelligence and knowledge of human nature suggest to him. His endeavours, in a word, should tend to make every member of society enjoy an amount of health in proportion to the strength of his constitution. Constitutions being very varied afford indications which are not less so.

If the practitioner who relieves suffering is a necessity, the physician who prevents you from being ill is still more essential. In many cases, you may do without the first, nature alone effecting the restoration to health; but the state of manners, degree of civilization, and the inaptitude of men in general to

discriminate what is to be avoided from what must be observed, render the second indispensable.

22. We can say then that the medical man is a *collective individual*, that is to say, that he must unite in one and the same person both the Doctor of health and the Doctor of disease.

The attributes of the first, the most essential and the most proper to fulfil his mission, are to point out the defects of social organisation as well as the reforms to be introduced, to promote both the moral and physical improvement of mankind. The treatment of a disease would then become for the physician a rare occurrence, instead of being his chief and sole occupation. Such are not however, the feelings of a certain number of the disciples of Esculapius of the present day.

Most practitioners, however, have only one object in view: To acquire fame and fortune by the number of diseases which they can and do treat.

It is particularly among young practitioners that these ideas prevail in the highest degree. One not unlike the hero of the "diary of a physician," sallies forth early hunting squares and parks, alleys and lanes, in search of a patient who will permit him to show to the public that he knows how to prescribe the most elegant preparation of the pharmocopœia; another, expecting every thing from his surgical skill, longs for an operation to exhibit his uncommon dexterity and his imperturbable *sang froid.*

We must add however that when experience and age have thinned his hair or changed its colour, the physician loses that juvenile impetuosity, and he becomes more circumspect and calm. Without making terms with the disease, he combats it with the arms of prudence and experience, and if he bleeds as little as possible considering the exigencies of the case, it is to guard himself against the occurrence of consecutive affections.

He rests on a security acquired by a long and laboriously acquired experience, and the confidence which he inspires reacts in a most salutary manner in the circle of which he is the centre.

23. We have lastly to consider man respiring a vitiated air. He presents himself to our examination under a good many conditions:—

I. The air may be but slightly vitiated.
II. It may be deleterious.
III. He may respire but little of it.
IV. He may respire much of it.
V. He may be in a state of inactivity.
VI. He may be in a state of activity.
VII. He was previously healthy.
VIII. He was previously unhealthy.

If the ambient air is but slightly vitiated, everything being in the most favorable condition, the changes produced in the system will be slow but sure.

Thus, a person passing his life in the shade, never receiving the salutary influence of the sun's rays, will acquire but an imperfect development with a vigour in proportion. His diseases will always assume the asthenic type; and epidemics

will certainly carry off a greater number of victims in this class than in that more favourably situated.

Shade is almost always accompanied by moisture or humidity. This last favours the development of systemic conditions favourable to the detriment of force and consistence. A plant, placed in a sombre and damp situation will perhaps grow in length more than in a sunny exposure, but, its stem will be weak, slender, soft and unable to stand erect; it will either climb or creep. The same reasoning may be applied to a human being; situated in the same condition he may grow immoderately, but he will always be etiolated and sickly.

24. Man respiring a deleterious air. He respires either little or much of it; if he respires much of it and has previously been healthy, the changes which respiration produces in the economy will be sudden and of a sthenic character. For example, a strong and robust man exposed to either variolic or erysipelatous infections, will be affected in the ratio of his strength; the disease may attack him with equal violence, so to speak, and taking advantage of the slightest deviation in the regimen, or any trifling error in the treatment, it will promptly overpower the patient and carry him off in a short time; whereas a weak and cachectic person will often escape. Still, we cannot draw any conclusions in favour of the latter. Pure inflammatory diseases of a sthenic type, seldom resist a well conducted course of treatment; but those of an asthenic character, will always baffle the skill of the best practitioners.

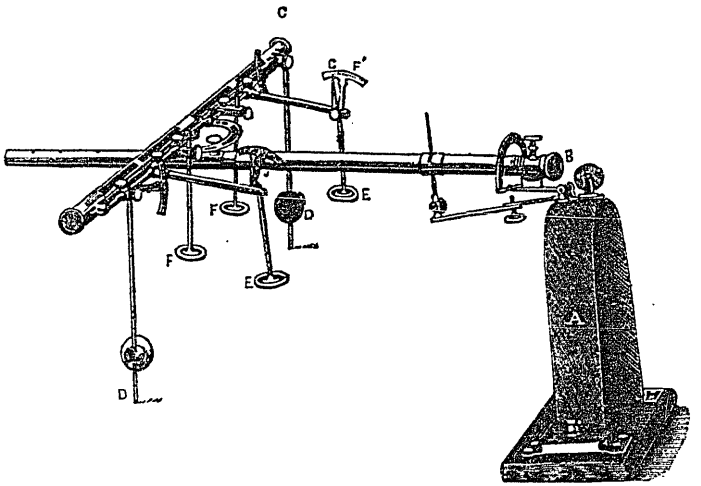
25. If respiration plays such an important part in the etiology of diseases, it may also rank the first in the manifestation of mental emotions. If we observe man, and even animals under the influence of a violent passion, what do we perceive? Even before passion is evidenced by attitude, contracted features and bristling of hair, respiration is perverted; it is momentarily suspended, then becomes agitated and more frequent. The cat and all the feline race have a peculiar breathing to express their anger. It is admitted as a principle of philosophy, that there is no effect without a cause; we may add that there is no cause without an effect, for we cannot conceive a cause otherwise than by the effects which render it evident to our understanding and senses.

If the peculiar breathing which the animal emits under the influence of anger is considered as the *effect* of a *cause* which has previously existed on the brain, (which may be doubted,) we must look upon it as a cause productive of subsequent effects. For instance, naturalists have observed that the air expired by wild beasts under such circumstances, possesses noxious deleterious properties, to those who inhale it. One would imagine that the animal itself is conscious of it, as it expires with all the force of its lungs, and in as great a quantity as possible, in order to repulse or annihilate the object of its passion. A deeper study of that morbid respiration or expiratory effort, which we think reacts on its author in a more or less pernicious manner when it cannot reach its aim, would perhaps lead to the discovery of some unsuspected secrets. (We might perhaps find here one cause inductive of hydrophobia.) Here we stop, however, and will feel sufficiently gratified if some more learned observer will investigate more thoroughly the subject.

26. The point of view under which we have treated respiration is so novel

that it required, more extensive development; but time and circumstances have imperiously restricted me to a mere sketch of the subject.

I now conclude with a description of the Pneometer, an instrument which I have contrived and got constructed in this city, for the purpose of determining with a mathematical exactitude the different expansions of the lungs, whether horizontal, vertical, or lateral.



The object contemplated in the construction of this instrument, is to determine with exactitude the relation which exists between the volume of air which enters the lungs and the development of the body.

From the conclusions we have drawn from the labours of authors who have written on Respiration, conjoined with our own observations, the succeeding laws would appear to be established; 1. That the quantity of air respired governs the quantity of blood; 2. That the quantity of blood governs the weight, size and height of the body; 3. That every cubic inch of air respired represents very nearly a pound of blood; 4. That every pound of blood in the body, is equivalent to eight or ten pounds of the weight of the body; and 5. That twenty-four pounds in weight of the body are about equivalent to an English foot in the height of the body.

Having made a great number of experiments on healthy persons, we have found but few exceptions to the laws just laid down.

The appreciation of the power of the constitution or of its healthy condition, depends upon the true relationship between its height and weight, and its respiratory capacity. These have limits established by the properties of matter itself, and these limits serve at the same time as the boundaries of the development of the height and weight. Hence it is that beyond a certain development of the body, respiration no longer follows its increase, and any further increase in the volume of the body may be considered abnormal. We cannot transcend the limits of the dilating properties of matter, without at the same time destroying its cohesion, with a disintegration of its molecules, or at least producing a relaxation of its texture.

Nearly all the changes produced by a peculiar pathological condition of the body react on the respiration, and alter it more or less. They are numerous, though not varied in character. We ought not therefore to feel surprise at the enormous number of phthisical people, when we consider the conditions to which the largest portion of society have their respiratory organs exposed. (*Here see Thesis.*)

The height and weight of the body being easily determined, it only remains to ascertain the respiratory capacity of the lungs.

The means hitherto adopted or employed for the purpose have afforded but uncertain results. To breathe into an hydraulic apparatus for the purpose of displacing a certain quantity of fluid, or to blow into a bladder whose capacity is afterwards to be estimated, were the means adopted to establish or prove the power of the lungs.

The air expired, in a natural or forced expiratory effort, differs so essentially from that which has been inspired, both in volume, density and properties, that it is impossible to ascertain the volume of air *inspired*, by the mere appreciation of the quantity *expired* (*see the same Thesis*) a person being enabled to continue the act of *expiration*, for a comparatively long period, without the least movement of the walls of the chest.

To determine the volume of air, which we introduce into our lungs by a gentle or forced inspiration, seems to us the surest means of determining the exact capacity of the pulmonic organs. We need not take into consideration the residual air which plays but a secondary part in the results of respiration. In cases of asphyxia the residual air in the lungs is the immediate cause of death by its toxic action on the system. (*See same Thesis.*)

The air can only distend the lungs in proportion to their capacity of dilatation, and the greatest efforts cannot make one atom more penetrate them, than they are capable of receiving. This dilatation of the lungs shows itself in three different directions, 1. in an antero-posterior one; 2. in a lateral one, and 3. in a vertical one. To determine with precision these three measurements, with the modifications which certain pathological conditions of the lungs may make them undergo, and especially pulmonary consumption, has been the subject of our research, and such the object which we think we have attained in the invention of the *Pneometer*. The first condition, and the most essential, was to secure a fixed and firm *point d'appui*, independent of the body, yet permitting at the same time the freest action over every part of the thorax before and behind. The second, to conjoin in one point of the instrument the three movements of the chest; the antero-posterior, lateral, and vertical or that of elevation; the third to note the irregularity of expansion in a sound lung, compared with that in an unhealthy one. The fourth, by the facility of applying the instrument to any part of the thoracic region, anterior, as well as posterior, to adapt itself to chests of all degrees of development. We have realised all these conditions in a mechanical contrivance, at once simple, sensitive, and of the greatest accuracy.

The following is a description of the instrument:—A. is a collar made of metal and covered with velvet to be placed round the neck, resting on a tablet covered also with velvet and placed under the neck. This collar serves as the *point*

d'appui. Its upper part has an adjustment which connects it with one extremity of the tube B.

B. is what we call the Regulator. The extremity of the Regulator B, connected with the collar, has three movements:—1. A movement of elevation, representing the antero-posterior expansion of the chest, the ratio indicated by the most anterior needle. 2. A movement on its axis, representing the difference of expansion between the two lungs, indicated by the needle behind the first one, and 3. A lateral movement.

At the opposite extremity of the Regulator, is attached the transverse tube C, which is nothing more than an ordinary spirit level.

This spirit level has three motions:—1. One which permits it to slide along the whole length of the Regulator, permitting it to be fixed at any point of this latter. 2. A movement round the axis of the Regulator, which enables it to enregister the most trifling differences in the antero-posterior expansion of either lung; and 3. A movement on its own pivot, capable of enregistering the difference in the relative vertical expansion of either side of the chest.

The disks are in pairs:—D.D. serves as a support to the spirit level for the antero-posterior movement of the chest. The pair E.E. possess a peculiar action; they give the exact measurement of the vertical expansion or the elevation of the ribs on the two sides of the thorax. This measurement is indicated by the needle F.F. on the arcs of the circle H.H. graduated in divisions of an inch, and lastly the pair F.F. determine or show the amount of lateral expansion.

When it is desired to determine only the antero-posterior movement, the spirit level may be dispensed with, and it can be detached from the Regulator. We then take one of the disks D.D. and screw it on the ring J, which may be shifted to any point of the Regulator, and can be applied in succession to any part of the chest, either anteriorly or posteriorly, that we desire to explore. Every degree indicated by the disks F.F. correspond to a half inch of lateral expansion. Every degree on the needles indicates one inch of antero-posterior expansion: and every degree, indicated by the disks E.E., corresponds to a quarter of an inch of vertical elevation. The screws, by fastening or relaxing the different pieces of the apparatus, permit the suspension or continuance of all the movements of the instrument.

Under all circumstances of examination the individual, whose chest we wish to explore must be in the recumbent position. If it is wished to ascertain the respiratory capacity of any individual, all that is required is to make him take two or three forced inspirations, and we note on the *Pneometer* the degrees of expansion of the three thoracic movements. Multiply these three factors into one another, and the product will represent in cubic inches the volume or amount of air which has entered the lungs. Comparing this result with the height and weight of the the individual, we can easily arrive at a conclusion in regard to the pathological condition of his lungs.

For example: An individual furnishes the three following thoracic expansions: 1. the lateral, $3\frac{1}{2}$ inches; 2. the antero-posterior, $2\frac{1}{2}$ inches, and 3. the vertical or that of elevation, $2\frac{1}{4}$ inches; the product of these three factors gives $19\frac{3}{4}$ cubic inches of inspired air. Each cubic inch of inspired air, being equivalent to,

as previously stated, a pound or nearly so of blood, furnishes an amount of blood in the body of about 19 pounds.

A pound of blood represents nearly eight or ten pounds of the entire weight of the body; and therefore the whole sum would be equivalent to, or represent, a weight of about 152 lbs. And again 24 pounds of the whole weight of the body, representing nearly an English foot, 152 pounds would represent or be equivalent to a height of 5 feet 10 inches and a fraction.

To conclude, a man inspiring 19 cubic inches of air ought to have circulating through him 19 pounds of blood; he should weigh about 152 lbs., and should be about 5 feet 10 inches in height.

In an examination of pulmonic affections to avoid error, certain precautions are necessary in the calculation of the expansions. For example, a right handed person, whose thoracic muscles are more developed on the right side than on the left, would exhibit a greater antero-posterior expansion on the side of greater development, and might lead to incorrect conclusions as regards the left lung. If we examine attentively the three expansions of one lung, and compare them with those of the other lung, the one which exhibits the less amount of expansion in the three directions may be declared, with certainty, a diseased one.

In investigating the inspiration, and especially that which is not forced, we determine the amount of air which favours the maintenance of life. If the air is pure, even notwithstanding the health should suffer or fail, we ought to look for the causes in some constitutional deficiency of the healthy organism. But if on the contrary the air is impure, the constitution of the individual being otherwise in a healthy condition, the treatment of the consecutive diseases should be exclusively directed to the purification of the circumambient air.

This nozological statement may be reduced to the two following corollaries, that all diseases have their origin either in the atmosphere or in the constitution of the individual.

Thence follow two general indications of importance:—

1. To improve the condition of the atmosphere when the constitution of the individual is sound.
2. To ameliorate the constitution of the individual when the atmospheric conditions are perfect.

PHYSICAL DEPARTMENT.

ART. XXII.—*Winter falls of rain and snow in Montreal.* By A. HALL, M.D., &c.

As a great deal of curiosity has been exhibited with reference to the relative amounts of rain and snow which have fallen during this last winter and the one preceding, I have compiled the following two tables from my meteorological register, and the facts disclosed are certainly curious enough in their way. Contrary to common expectation, it appears that nearly 14½ inches of snow fell more last winter than this one, with 3.73 inches extra of rain; yet, the amount of snow in the streets last month gave the general im-

pression that the preponderance was heavily in favour of the present winter' This appears however not to have been the case, as the recorded statistics prove.

A very remarkable difference, however, existed between the two winters. The winter of 1860–61, was remarkable for its severity, the temperature having fallen to the lowest probably ever recorded in this city, viz.:—34° on the 8th February, 1861; yet although we had a heavier fall of rain and snow, several thaws occurred, which melted it off from time to time. The last winter on the contrary was one of the warmest which we have ever had, the lowest temperature indicated by the thermometer having been only—11° 7′ occurring on the 4th January of this year. This last winter, nevertheless, warm comparatively as it was, exhibited only one or two thaws, the consequence having been, that the snow as it fell accumulated, and when the spring set in, the quantity of water from the melting snow became so unusually great, as to burst through every barrier, tear up the streets, choke up the sewers, and by a back water flood the cellars of a very large proportion of the houses in town; in our own cellar we had upwards of three feet of water. Now as this is a contingency which has happened once, there can exist no reason why it should not happen again; and as the events of the last month have demonstrated the utter insufficiency of all the main drainage of the city, the City Council should at once take measures to rectify this grievous evil, which not only destroys all family comfort, but in its full influence tends to endanger life by the induction of disease. Upon nothing is the salubrity of a town so mainly dependent, as upon a thorough and effective system of sewerage; and we venture the assertion, that with every natural facility for such a purpose, there is not a city on this continent whose artificial drainage is worse; and this not the consequence of natural impediment, but the result of a peculiar engineering skill which led the current of the main sewer, not down or with the stream so as to permit it to disembogue below the city, but upwards or against the current, causing the discharge to take place at a point almost literally above it; and this is actually the fact as regards the sewerage of the upper half, and the finest and best half of the city.

The following statistical averages will follow from the second table. The average, during seven years, of the falls of rain and snow, are as follow: The average fall of appreciable rain is 12.36 inches; that of appreciable snow is 110. 11 inches; and the average of both rain and snow melted and reduced is 23.98 inches. It is a singular fact that the winter of 1858–59, shewed 4.33 in deficiency of this mean result, while that of 1860–61, should have exhibited exactly 4.37 inches in excess.

1

AMOUNT OF RAIN AND SNOW DURING THE WINTER MONTHS OF 1860–61 AND 1861–62, FROM OCTOBER TO MAY RESPECTIVELY.

Months.	Rain in inches.	Snow in inches.	Total rain and melted snow in inches.
October,.....	3.98	Inap.	3.98
November,.....	2.26	6.00	2.87
December,.....	1.30	20.69	3.37
January,.....		44.25	4.55
February,.....	1.10	37.75	5.09
March,.....	3.01	10.50	4.06
April,.....	2.57	17.00	4.43
Total,....	14.22	136.19	28-35

1861–62.

October,.....	4.25	Inap.	4.25
November,.....	1.69	4.30	2.83
December,.....	1.54	11.95	2.98
January,.....	0:10	46.58	4.87
February,.....	Inap.	27.35	3.03
March,.....	2.18	23.15	4.27
April,.....	0.73	3.40	1.52
Total,.....	10.49	121.73	23.75

2

FALL OF RAIN AND SNOW DURING THE WINTERS FROM 1855-56 TO 1861-62, FROM OCTOBER TO MAY—SEVEN MONTHS.

Winter.	Total rain.	Total snow.	Total rain and melted snow.
1855–56	14.02	108.35	25.34
1856–57	12.04	127.52	25.26
1857–58	13.94	79.25	24.37
1858–59	10.65	82.00	19.65
1859–60	11.21	115.75	21.18
1860–61	14.22	136.19	28.35
1861–62	10.49	121.73	23.75

Montreal, May 10th, 1862.

PARIS CORRESPONDENCE.

The various remedies now in use for stopping a copious flow of blood, though generally active enough, as for instance lunar caustic, are not equally applicable in all cases, and any addition to the list of such remedies is always acceptable to the profession. Latterly a plant called *Bengarvar Gambo* (*Palea Tibotii*), has been brought over from Java, which possesses extraordinary hæmostatic qualities. It is a kind of fern, yielding a mass of delicate filaments, so light and flexible as to float a long time in the air. The colour varies according to their thicknesses, from a brownish gold hue to a greenish black. Six grains of these filaments form a sufficient quantity to stop the bleeding of an artery a twelfth of an inch in diameter. This substance displays such avidity for water, that it becomes soaked through and sinks to the bottom of the vessel containing it in less than half a minute. If exposed to heat, it exhales an empyreumatic odour, and if it be burnt it explodes. Its styptic properties are naturally attributable to the rapidity with which its filaments, acting by capillary attraction, absorb the aqueous parts of the blood, and thus causes its immediate coagulation. Moreover, the elasticity of these filaments, swollen by the absorption of the liquid, causes them to form a kind of impenetrable plug, which, adhering to the wound, keeps it well closed. The advantages of this styptic over those already known are the promptness of the effect and the possibility of forming the coagulum where other agents fail, as for instance, in carcinomatous and scorbutic ulcers. Before using it, it must be triturated—a certain quantity is then applied to the wound, and a compress adapted over it. The styptic thus penetrates into the narrowest fissures, and instantly produces the desired effect.

A woman at Aumale has lately been delivered of a child, provided with a strange appendage resembling a tail. It was attached above the sacrum to the

last lumbar vertebra, and appeared to be a prolongation of the spine. It was upwards of three inches in length, and of the diameter of a goose-quill, tapering towards the end, and hard to the touch, without any indication of pulsation. Its connection with the body appearing extremely loose, Dr. Chapuis, chief physician of the hospital, effected a ligature at its base, which did not cause the nfant to cry, and determined the fall of this singular appendage in the course of six days. After its separation, it shrunk to half its former size, and on being split open lengthwise, it was found to contain under the epidermis a stratum of nervous papillæ only perceptible by the aid of a magnifying glass, and some filaments of cellular tissue under the derma.

Dr. Devay, professor of clinical medicine at the medical school of Lyons, has just published an interesting work on the disastrous effects of marriages among relations. He shews that in fixing certain prohibited degrees of consanguinity, the church in point of fact was only favouring the observance of one of the most important laws of nature, the infringement of which is punished with inevitable degeneracy. Unions within the limits of consanguinity are hurtful not only to the human race, but also to animals. It is true that such unions among the latter are promoted by the breeder for profit's sake,—the Disley and Durham oxen, so admirable in the eyes of the breeder, are instances of this; but sterility is the usual consequence of the practice. In the human race two circumstances have contributed to favour marriages among relations—the first occurs when a small population is pent up in some remote hamlet not easily accessible. In such places, married between consanguinity people is the rule. The second case is that of families desirous of maintaining their rank in society, or preventing the dispersion of their fortune by marrying within their own circle. Dr. Devay states that out of 121 marriages of this kind observed by him, 22 were barren. Only four of the number were marriages between uncles and grand-nieces—the others were between cousins or the issues of cousins. When sterility does not occur, the issue is diseased, or afflicted with blindness or deafness; also in many cases afflicted with irregularity of conformation. Of all these irregularities, polydactilism, or multiplicity of fingers is the most frequent. Dr. Devay has observed this in 17 out of the 121 cases above mentioned. He states that in a certain secluded spot, where the inhabitants had no communication with other populations, polydactilism had become quite endemic, and that this strange anomaly disappeared some time after a new road had been cut through the place.

An interesting communication on the healing qualities of carbonic acid has been received by the Academie des Sciences from Drs. Demarquay and Leconte. These gentlemen had sent up a paper about two years ago on the modifications which atmospheric air, oxygen, nitrogen, hydrogen, and carbonic acid were calculated to produce on sub-cutaneous sores, and had also given a description of the healing process. In their present paper they more especially mention the healing power of carbonic acid in the case of tendons of recent formation, whence they have been led to try it for obstinate sores. For this purpose the diseased limb is placed in an apparatus of their invention, made of India rubber, and communicating with a vessel in which carbonic acid is evolved. Sometimes the application is made only once in 24 hours, at others the gas is evolved every

six or eight hours. As the pressure exercised by the India rubber on the limb must not be so strong as to impede the circulation, the borders of the apparatus are secured by strips of diachylon plaster, to prevent the escape of the gas. The physiological phenomena produced by the carbonic acid are as follows: 1. The patient announces a sensation of heat and pricking all over the part subjected to the action of the gas, and especially on the sore—moreover the skin is slightly injected. 2. After the apparatus has been on some time, it is found to contain a certain quantity of liquid produced by the exhalation from the sore and the perspiration of the member. The apparatus must therefore be washed with a small sponge once or twice a day, if the application is to be continuous. The exciting effects produced by the carbonic acid shews that this agent must not be employed on recent sores, but only on those which have obstinately resisted all other treatment. Still the excitement produced by carbonic acid is much inferior to that produced by oxygen, the application of which should, in certain cases, precede the former. Under the influence of carbonic acid the detersion of the sore is effected—it assumes a rose-coloured tint—its edges sink down, and in a very short time a pellicle is formed around, while points of cicatrization are remarked near the centre, which soon spread and join the border. Carbonic acid is therefore a most powerful healing agent in the cases above alluded to.

At the last sitting of the Academie des Sciences, a communication was received from Dr. Schuster, a distinguished practitioner of Paris, on the subject of Dr. Tripier's late paper on a new process of galvano-cauterization, applied to surgical cases, and founded, not on the calorific effects of continuous galvanic currents, but on their chemical action. Dr. Schuster, in his communication, reminded the Academy that the cauterizing property of voltaic currents due to their chemical action, has been employed by himself in surgical therapeutics for the last 23 years and upwards, he having in 1843 sent two communications on the subject to the Academy—one in January of that year, entitled, "On electro-punctures applied to various forms of dropsy, some encysted humours, varicose dilatations, cellulous and parenchymatous induration;" the other in October, "On the treatment of hydrocele by electro-puncture and galvanic cauterization." In these papers, Dr. Schuster established the fact that the curative action of continued currents rests on their *effects of causticity by chemical decomposition*, as much as on their dynamic and catalytic properties. This theory has since been reproduced and confirmed by new observations in a paper published by the "Bulletin Général de Thérapeutique," in February and March, 1859. The Academy evinced its interest in this important question by referring Dr. Tripier's communication, as well as Dr. Schuster's claim of priority, to the judgment of MM. Becquard and Bernard.

M. Velpeau presented, in the name of the author, Dr. Lebarillier, a paper on the mortality of foundlings at Bordeaux, within the age of a twelvemonth. In the course of twelve years—that is from the first January, 1850, to the 31st Dec., 1861—the number of infants within that age, admitted at the hospital was 6178, viz., 3073 boys and 3105 girls. Of this number, 977, viz., 510 boys and 467 girls died in the course of the first month; those that died at the hospital numbered 785, comprising 410 boys and 375 girls; the remaining 202, or

110 boys and 92 girls, died at the country. This excess of mortality at the hospital, compared to that in the country, is explained by the fact that the healthy subjects are sent into the country ten days at the latest after their arrival, while the sickly ones are kept there until they have recovered. Out of the 6178 children admitted, 2131 died before the end of the year, viz., 1114 boys and 1017 girls—1083 having died at the hospital and 1048 in the country. Thus the mortality at the Hospital of Bordeaux is not more than 33 per cent. in the first year of infancy, while it amounts to 55 per cent. in Paris and the department of the Seine, according to Dr. Bouchut's calculations.

W. N. Côte.

Paris, Ecole de Médecine, April 15, 1862.

REVIEW DEPARTMENT.

ART.. XXIII—*On the Diseases and injuries of the Hyoid or Tongue bone.* By George D. Gibb, M.D., A.M., F. G. S., &c., &c. Illustrated with engravings in wood. London: John Churchill, 1862. Pplt. pp. 48.

We acknowledge with great pleasure the reception of the foregoing *brochure*, as one the subject of which is almost entirely new, and which opens up a new field of surgical and pathological investigation. Great credit is unquestionably due to Dr. Gibb for the industry which he has displayed in the collection of cases of injury of this bone. The Hyoid bone is one whose injuries or accidents have been scarcely deemed worthy of mention by surgical authors. It is indeed alluded to in Gross's Compendium of Surgery, but little has been said about it, while the generality of works on that branch of our profession, are usually silent on the matter. Hence it is that we regard the *brochure* as an opportune publication, and we are especially pleased that a McGill University graduate has been one of the first to attract especial attention to a class of disorders whose influence is occasionally of the gravest character. We question if the *brochure* is obtainable in this country, but we must say that every surgeon who can obtain a copy will rise from its perusal with the reflection, that Dr. Gibb has effected a decided advance in the progress of our surgical and pathological knowledge.

ART. XXIV.—*On Bandaging and other operations of Minor Surgery.* By F. W. Sargent, M.D., Member of the College of Physicians of Philadelphia; one of the Surgeons to Wills' Hospital, &c., &c. New edition with an additional chapter on *Military Surgery.* By W. F. Atlee, M.D., and one hundred and eighty-seven illustrations. Philadelphia: Blanchard & Lea. Montreal: Dawson & Son, 1862. 8vo. pp. 383.

We have read Bourgerie's Minor Surgery with pleasure and profit, but in many respects the volume now before us immeasurably transcends it. To the surgical student there is no more difficult branch of his duty to learn than that of bandaging. The application of a bandage is commonly considered a simple mat-

ter, whereas it is one which is in reality the very reverse, and the directions laid down in Sargent's Minor Surgery are full and precise, no part of the body which is susceptible of it having been exempted from a detail, the description moreover accompanied with a well executed wood cut demonstrative of the manner in which it is to be performed. It is so with all the minor operations of surgery, the directions for their performance being associated with wood cuts representative of them. Such being the fact, we consider that no better book could be placed in the hands of an hospital dresser, or the young surgeon, whose education in this respect has not been perfected.

The last chapter is devoted to a consideration of "Gun-shot wounds, together with the more important peculiarities in the practice of military surgery." This chapter adapts the work to the exigencies of the profession in the United States at the present time, and must render it more acceptable to them. While all regret the fratricidal war which is there culminating, we cannot but admire the philanthropy of our profession, which in every work issuing from the press is endeavouring to mitigate the casualties which must occur, by the inculcation of rules of practice suitable to the emergency.

We most cordially commend this volume as one which the medical student should most closely study, to perfect himself in these minor surgical operations in which neatness and dexterity are so much required, and on which a great portion of his reputation as a future surgeon must evidently rest. And to the surgeon in practice it must prove itself a valuable volume, as instructive on many points which he may have forgotten.

ART. XXV.—*Geological Survey of Canada.*—Descriptive Catalogue of the collection of the economic minerals of Canada and of its crystalline rocks, sent to the London International Exhibition for 1862. John Lovell, Montreal. Phlt. pp. 83.

Few persons can have any idea whatever of the mineral resources of Canada until they have perused this pamphlet, prepared by Sir William E. Logan, the Director of the Geological Survey of Canada. The catalogue is divided into the following ten headings and comprises the collection sent to the International Exhibition. 1. Metals and their ores, 2, Minerals applicable to chemical manufactures, 3, Refractory minerals, 4, Minerals applicable to common and decorative construction, 5, Grinding and polishing minerals, 6, Mineral manures, 7, Mineral paints, 8, Minerals applicable to the fine arts, 9, Minerals applicable to Jewellery, and 10th, Miscellaneous minerals.

Under the first head we have ores of Iron, Lead, Copper, Nickel and Cobalt, Silver, Gold and Platinum and Iridosmine, exhibiting also the localities in which they are respectively found, a goodly array for Canada, and if she only had the coal at hand to work these ores economically, she unquestionably would become one of the richest countries on the globe. A great deal however is doing in this respect under every disadvantage.

One of the most interesting and curious discoveries of late years is that of the

coal oil springs in the volcanic district surrounding Niagara and adjacent parts. We permit Sir William Logan to speak on this subject for himself.

Petroleum or rock oil.—Enniskillen, lot 16, range 2.—Natural springs of rock oil have long been known in several localities in Western Canada. Two of these are in the township of Enniskillen, in the southern part of which are two patches of an acre or more, covered with a layer of several inches of viscid mineral tar or asphaltum, which has resulted from the drying up of the petroleum of these springs. Wells sunk in their vicinity, to a depth of from forty to sixty feet, through the superficial clays, encounter a stratum of gravel, resting on the surface of the rock beneath, and often filled with oil; giving origin to what are called surface wells. On boring into the underlying soft fossiliferous shales and limestone, fissures are met with at various depths, from which rise abundant supplies of oil, often accompanied with inflammable gas, and with water, which is sometimes saline. These fissures, which also supply the surface wells, are apparently connected with the oil-bearing strata of the Corniferous limestone: which is from 200 to 300 feet below the surface, in Enniskillen. Within an area of about four square miles in the first three ranges of this township, there were supposed to be, in August, 1861, about seventy wells, yielding more or less oil. Of these, forty were surface wells, that is, wells sunk from forty to sixty feet through the drift clay and gravel, to the rock beneath. Some of these latter, which had yielded but little oil, gave abundant supplies by boring into the rock. The oil-bearing fissures or veins, in adjacent wells were met with at depths varying from thirty-six to 100 and even 150 feet from the surface of the rock. One of the most abundant occurred at sixty feet. In some few cases, the oil from the borings rises above the surface of the ground, constituting what are called flowing wells.

It is not easy to know the amount of oil which these wells are capable of supplying; since from the great difficulty in getting it to market, arising from the want of good roads, few of the wells are regularly and continuously pumped. Some of those which were bored in July and in August last, are stated upon good authority, to have yielded from 400 to 500 barrels of oil, in a week or two after having been opened; but the reservoirs provided, being filled with oil, the pumping of the wells was suspended. Two bored wells, belonging to Mr. Williams, which were the only ones continuously wrought in August last, are said to have yielded together, during some months, from twenty to twenty-five barrels (of forty gallons each) daily. About six miles to the northward, on lots thirteen and fourteen, of ranges ten and eleven of the same township, sixteen wells have been sunk last August; of which twelve were surface wells, and had yielded large quantities of oil. Several of these had been wrought for nearly twelve months, and were supposed in that time to have yielded 1000 barrels. Other wells had recently been bored to a depth of nearly 200 feet, but yielded less oil than the surface wells. The wells of this region seem, thus far, to be less important than those in the southern part of the township. The oil from the deep or rock wells, is somewhat lighter and more fluid than that from the superficial wells, which is very dark colored and somewhat viscid.

Great expectations have recently been excited by a flowing well, known as Shaw's, which was sunk to a depth of about 200 feet, and when first opened, a few weeks since, was supposed to yield, for a short time, 2000 barrels of oil in twenty-four hours; which flowed into a stream near by and was lost. This well is however said to have been since closed, so that the discharge is under control. Another recent well, near by, known as Bradley's, is nearly as abundant. The experience in Pennsylvania has however shown that the supply from these flowing wells soon diminishes, and eventually fails. Adjacent borings sometimes appear to be connected with the same oil-yielding fissure, and to affect each other's supply; in some cases air passes down one shaft when the other is pumped.—*Corniferous formation, Devonian.*

Tilsonburgh.—Near the village of Tilsonburgh, in the township of Dereham, natural oil springs occur, and two wells have been bored in the Devonian limestone, which is here covered by about forty feet of clay and sand. One of these had been sunk thirty-six feet in the limestone, and had furnished, when seen in August, a few barrels of oil. In the townships of Zone, Mosa, and Orford, on the banks of the Thames, oil springs abound for a distance of about four miles. These, like the other natural springs mentioned above, furnish but small quantities of oil; several wells have however been sunk in the clay, and the rock beneath has been drilled. One of these at a depth of seventy feet in the clay, had yielded about forty barrels of oil.—*Corniferous formation, Devonian.*

Bertie, lot 13, range 1.—In a quarrry on the lot indicated, two oil-bearing beds, one of two and another of six inches, are seen; they are made up in great part of corals of the genera *Heliophyllum* and *Favosites*, in the pores of which the oil is lodged like honey in a comb. Other coral beds in the same series, however, are quite free from oil. The limestone beds above and below these are compact. and not at all impregnated with oil, which, even in the coral beds is seen, when these are freshly broken, to be confined to the fossils, and not to be uniformly disseminated in the layer. When the rock is quarried, the oil flows out, and may be collected on the water in the bottom of the quarry. The facts observed with regard to the petroleum springs in Canada and the United States, would seen to show that they are always on the lines of anticlinals, along which the oil from its superior levity accumulates, and afterwards by the pressure of water is raised to the surface through the natural fissures which generally occur upon anticlinals. The oil-bearing limestone underlies an area of 7000 square miles in Western Canada. This limestone is of marine origin, and contains no organic remains but those of marine animals; so that we are led to conclude that these hydrocarbons have been derived from a peculiar decomposition of their tissues. These as is well known, differ but little from those of the plants, which in many more recent formations have given rise to bitumens. We may suppose that many soft gelatinous animals, and perhaps even marine plants, whose traces have disappeared, may have contributed to form the petroleum of these coral beds.—*Corniferous formation, Devonian.*

To those who desire an insight into the mineral resources of this country, we could present no better manual. It is complete as far as the information collected by the Geological Survey extends, and Sir William deserves the thanks of every Canadian for the pains which he has bestowed upon this pamphlet. This collection of Canadian minerals will probably constitute one of the most interesting and important in the International Exhibition.

ART. XXVI.—*The Principles and Practice of Obstetrics.* By GUNNING S. BEDFORD, A. M., M. D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Obstetrics in the University af New York, &c. Illustrated by four coloured lithographic plates and ninety-nine wood engravings. Second edition, carefully revised. New York: William Wood. Montreal: B. Dawson & Son. 1862. Royal 8vo. pp. 731.

We can well imagine Professor Bedford's feelings while penning these opening lines of the Preface to the second edition of his valuable book: "An author can covet no richer compensation for his labours than the endorsement of his peers. It would therefore be affectation in me to attempt to conceal the pleasure I

experience in being thus early called upon for a preface to the second edition of the 'Principles and Practice of Obstetrics.' But a little over four months have elapsed since the book was first issued from the press." We congratulate Dr. Bedford on the success which he has achieved. It is more than a success, it is a triumph, and a fact almost unparalleled in medical literature, that in the short period of four months a second edition should be demanded. We anticipated however almost as much. Its easy flowing style, independent of the lucid manner in which every topic is treated, is such as to make the work a peculiarly attractive one both to the student and to the practitioner.

The author states that the present edition has undergone a thorough revision. We need scarcely add that the volume is issued in the most finished style of art, leaving nothing whatever to be desired as regards the printing, the wood cuts, lithographs, or the binding. In these respects it is a credit to the establishment of the publisher.

EDITORIAL SUMMARY.

SWEDISH ORDER OF KNIGHTHOOD CONFERRED ON MR. WILDE OF DUBLIN.—We are exceedingly pleased to learn that the King of Sweden and Norway has been pleased to confer upon Mr. Wilde of Dublin, Surgeon Oculist in ordinary to the Queen in Ireland, and Vice President of the Royal Irish Academy, the Order of the Pole Star. An honor thus conferred upon one member of the Profession, so deservedly celebrated for his literary, antiquarian and scientific labours, is one which reflects itself on the profession at large, and we do most cordially congratulate Mr. Wilde on his deservedly acquired honor.

Lithotrity performed on King Leopold.—Mr. Civiale has lately performed lithotrity on the King of Belgium. The calculus was small, and was crushed successfully in two sittings. Some time since Mr. C. performed the same operation on King Bomba, for which service he received a fee of 25,000 dollars.—*Medical News.*

A Novel Marriage License.—M. Geordans, Prof. of Midwifery at Turin, gave this year the lecture introductory to the session, and he alluded principally to deformation of the pelvis in relation to marriage. So impressed is he with the importance of a capacious pelvis in a married woman, that he proposes the following regulation, "Every woman shall be required before signing the marriage register to produce a certificate respecting the proper conformation of her pelvis." Another summary measure touching pelvic organs has been proposed by M. Larghi of Vercelli as a prevention of puerperal fever, "the lining membrane of the *uterus* should be well brushed with a solution of nitrate of silver."—*L'Union Médicale, Medical News.*

Life in the Glacial Seas.—From the investigations of the scientific commission despatched by the Swedish Government to investigate the Physical Geography at Spitzbergen, it appears that animal life is abundant in these glacial regions at the great depth of 1250 fathoms.—*Philadelphia Med. and Surgical Reporter.*

Dr. G. B. Porter of the U. S. Army.—Serious charges of "mismanagement and cruelty" were brought against this officer. A court martial was summoned, and the court honourably acquitted him without even going into evidence for the defence. The *Boston Med. Journal* remarks "that it is most reprehensible that "the editors of the daily press should give currency to such odious charges, "calculated at the present time to bring infamy on the unfortunate individual "who incurs them, without the possibility of his establishing innocence perhaps "for months."

THE

British American Journal.

MONTREAL, MAY, 1862.

THE LICENSING OF MIDWIVES.

At the time when the Act incorporating the College of Physicians and Surgeons of Lower Canada was under consideration by the Profession of Quebec and Montreal, the peculiar condition of all the border settlements and small villages came under the notice of the parties who were entrusted with the measure, and it was considered a matter of impossibility to secure for them the services of regularly instructed midwives, in the absence of medical men, as their practice could not be sufficiently extensive to afford them the means of support. To secure therefore the utmost amount of assistance possible, and to prevent the services of a friendly neighbour in a time of need, being twisted into a violation of Law, with all its penalties, it was deemed proper at the time to restrict this necessary competency or professional ability to all women practising as midwives in the cities of Montreal, Quebec and Three Rivers, at that time, (1847) the three chief cities of the Lower Province. It was hardly to be expected that the time of the college, which may be considered as represented by that of its members, should be occupied with the tedious examination of midwives, and the granting them a certificate with its subsequent enregistration, without exacting some fee, yet, although far from the well known intention of the framers of the law, it does appear from Mr. Stuart's opinion, who is commonly regarded as one of our soundest constitutional lawyers, that the letter of the law is not consonant with the intention. However much this is to be regretted at the present moment, as opening the road to a flood of midwives in the cities, whose ignorance may be shielded by favouritism, (although we can scarcely think it possible that any two members of the college would thus prostitute their position,) it is evident that the Act of Incorporation requires an amendment, in this respect, and we are pleased to see that a committee has been appointed for the consideration of the matter, whose report will be presented at the ensuing Triennial meeting. It is far too late for any action to be taken on the subject in the parliament now sitting; but, while at the ensuing session of the Legislature, modifications of the Act must be sought for, it is at the same time not unworthy the attention of

the members of the college to secure at the same time the introduction of certain additions in the shape of apothecary clauses, so as to regulate and controul that important professional department. Every member of the college must remember the withdrawal of every clause affecting the apothecaries from the act incorporating the college in 1847, on the pledge of their introducing at the following session of parliament a specific act of their own. How that promise has been kept every member of the profession knows. It is full time that so important a department of the profession, as is that of the business and duty of the apothecary, should be under some legislative controul; and after waiting in vain for fifteen years with the utmost patience, during which long period of time not the least move has been made on their part, we think it full time that the college should move in the matter, and while seeking amendments to the act in one direction, to ask for additions in another. The interests of the physician and the public are so much at stake in this matter, that we trust that some action will be taken on the subject at the Triennial meeting so as to pave the way to some definite legislation. We must confess that we are at a loss to detect the motives which have tended as yet against the introduction of a bill, which could only be beneficial to themselves, and satisfactory to the profession and the public.

SUSPENSION OF DR. STEWART.

We publish the following important action taken by the Trustees of the University of Queen's College, Kingston, against Dr. John Stewart, late Professor of Anatomy. We noticed a few months ago his suspension from duty; the present proceeding effects his ejectment from office, and we cannot but say that the Board has acted most righteously in the matter. Dr. Roderick Kennedy, who holds Honorary certificates in both Anatomy and Surgery from the University of Edinburgh, has been appointed in his place.

Extract from the Proceedings at a Meeting of the Board of Trustees of the University of Queen's College, Kingston, held on the 15th day of April, 1862.

The Trustees having instituted an inquiry into a complaint brought against Dr. John Stewart, Professor of Anatomy, by the Medical Faculty of Queen's College, find that impropriety of conduct is duly proved, and they resolve to remove him, and they do hereby remove him from his office.

The following are the grounds of such removal:—

I. That he has publicly arrogated to himself powers that belong to the Trustees of the College.

II. That he has published injurious and calumnious statements in reference to Queen's College.

III. That he has conducted himself towards his colleagues in an uncourteous, ungentlemanly, and insulting, manner.

IV. That he neglected his duty in as far as he, for a considerable period, refused to attend the meetings of the Medical Faculty.

Extracted from Minutes of Proceedings by

(Signed,) W. IRELAND,
Secy. to Board of Trustees of Queen's College.

EXCISION OF THE KNEE-JOINT.

This operation was performed on a patient, recently by Dr. Hingston at the *Hopital de la Sainte Famille*, and we understand with perfect success. The *Patella*, nearly three fourths of an inch of the *condyles* of the *Femur*, the whole articulating surface of the *Tibia*, and about an inch of the head of the *Fibula* were found in a state of caries. As far as we are aware, we believe that this is the first time this operation has been performed in Canada.

THE WOODSTOCK INQUEST.

The following verdict of the Coroner's Jury was accidentally omitted from the published report of the Inquest as given in our last number, and which tends to explain certain observations of our own.

"The Jury on their oath find that—The deceased, Jonathan Thornton, died from rheumatic inflammation of the heart and its coverings, together with like inflammation of the lining membrane of the chest, and, as a consequence, dropsy or general effusion into that cavity.—Alex. Green, *Foreman.*"

SEMI-ANNUAL MEETING OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF LOWER CANADA.

MONTREAL, 13th May, 1862.

The Semi-Annual Meeting of the College of Physicians and Surgeons of Lower Canada, was held this day, at the Mechanic's Institute, when were present the following members of the Board of Governors:

Dr. Tétu, Beaudreau, Jackson, Russell, Gilbert, Chamberlin, Glines, Weilbrenner, Foster, Robillard, Turcotte, Smith, Smallwood, Marsden, Brigham, Marmette, Robitaille, Bibaud, Boyer, Fraser, Hall, Munro, Scott, Jones, Peltier.

Dr. Hall, President in the chair—The minutes of the last meeting, held in Quebec, in October 1861, were read and approved. Apologies were received, from the following gentlemen for their absence from this meeting, viz: Drs. Badeau, Sewell, Landry, Frémont and Wolff.

Dr. Hall, the President, after a few appropriate remarks, submitted an address of condolence to be sent, in the name of the College, to Her Most Gracious Majesty the Queen, on the occasion of the death of His Royal Highness, the Prince Consort.

The following is a copy of the address.

TO HER MOST GRACIOUS MAJESTY, VICTORIA, QUEEN OF GREAT BRITAIN AND IRELAND, &c., &c.

MAY IT PLEASE YOUR MAJESTY:—

We, the Governors of the College of Physicians and Surgeons of Lower Canada, avail ourselves of the present meeting, the first since the lamented decease of His late Royal Highness, the Prince Consort, to tender to Your Majesty the expression of our sincere condolence for the unspeakable loss, which Your Majesty, and the Royal Family and the whole British Empire have sustained.

Belonging as Canadians to a distant but not unimportant portion of the possessions of the British Crown, we are sensitive to every thing which transpires

in our mother country touching the welfare of the Empire or the happiness of Your Majesty.

The high scientific attainments of the departed Prince long excited our admiration, and were warmly dwelt upon by us; while the high example of domestic duty, which it was no less his privilege than his happiness to exhibit, will render the name of "Albert the Good" a household word for generations to come.

We also noticed with sincere gratification the lively interest which the late Prince Consort took in all measures calculated to promote the welfare and happiness of all classes of Your Majesty's subjects. We saw the timely aid and assistance which he rendered as well to scientific and educational institutions, as to ameliorate the condition of the humbler classes, and the judicious steps which he took and caused to be taken, for the improvement, of arts and manufactures. It has been well said that

"To live in hearts we leave behind is not to die."

We approach Your Majesty deeply sensible of the ineffable bereavement with which it has pleased God in His inscrutable providence to visit Your Majesty and the Royal Household.

We pray God to protect and guard Your Majesty and the members of the Royal Family.

On behalf of the College of Physicians and Surgeons of Lower Canada;

It was then moved by Dr. Chamberlin and seconded by Dr. Marsden, and resolved unanimously:

"That the foregoing address of condolence be adopted, signed by the officers of the College, and transmitted to Her Majesty through His Excellency the Governor General."

Drs. P. O. Tessier of Quebec, Alex. Duff Stevens, M. D., of Dunham, C. E., P. O'Leary, M. D., of Montreal, and Dr. Chevrefils of Nicolet, having signified their intention to become members of the College, in conformity with the bye-laws, were proposed as such, and will be ballotted for at the ensuing triennial meeting.

The President then made a few remarks upon a correspondence which had taken place between himself and Dr. Trudel, relating to the requirements of midwives, and stated that he, after consulting with Drs. Peltier and Jones, had come to the conclusion that the most prudent course to follow was to obtain a legal opinion in the matter. Henry Stuart, Esq., was accordingly consulted, whose professional opinion will be found in the last number of the British American Journal.

It was then moved by Dr. Marsden and seconded by Dr. Chamberlin, and resolved:

"That a Committee of three members be now named to consider and report at the triennial meeting, on the position of this College in reference to the licensing of midwives, the Committee to consist of Drs. Hall, Smallwood and Weilbrenner."

Dr. Peltier, Secretary for the District of Montreal, then stated, that numerous complaints had been made to him regarding the inactivity of the College in not carrying out the law against parties practising illegally, whereupon it was moved by Dr. Fraser, seconded by Dr. Brigham, and carried:

"That the Secretaries of the College of both Districts be requested to write to all persons practising without a license in Lower Canada, and take such further steps in the interest of the Profession and Public as the individual cases may seem to require. Any necessary expenses incurred to be defrayed from the funds of the College."

The Secretary read a letter from Dr. Landry, stating that he had received certain papers from Dr. Proulx of Sainte Marie (Beauce), relating to a man practising midwifery down in that neighbourhood without license.

From the above facts it was then moved by Dr. Marsden, and seconded by Dr. Robitaille:

"That the Secretary for the District of Quebec be instructed to take legal proceedings against the person indicated by Dr. Proulx, provided Dr. Proulx furnishes sufficient evidence to secure conviction."

The Board then proceeded with the examination of candidates.

The following gentlemen with diplomas from the University of McGill College, were sworn and received their licenses. Messieurs Belleau, Wherry, Chesley and Trenholme.

Dr. Racey with a diploma from the University of Edinburgh, was also sworn and received his license.

After the usual examination the following gentlemen having been found duly qualified received their licenses.

Messieurs Alfred Mignault, Théophile Lacasse, Avila Valois, Hubert Nadeau, Frédéric Paré, Napoléon E. Coderre, Herménégilde Préfontaine, Honoré Fontaine, Alfred Vilbon, Thomas Larue, Amédée Fortier, Léon Vermet, J. O. Lallier, Etienne Prévost, Joseph Xiste Beaudry, Joseph Sarault, Pierre Grenier, and George LaMontagne.

Mr. Charles E. Smallwood, after undergoing the required examination, received his license as Chemist and Druggist.

The following gentlemen, after submitting to the classical examination and passing it creditably were allowed to enter upon the study of medicine, viz:

Hormislas Ladouceur, Edmond Héroux, Eméry Allard, Gérasime Germain, L. Séraphine Poulin, Anselm Achim, Alexis Thibault, Alphonse Deschamps, Ovide Desnoyers, Charles Samson, Edouard Lefaivre, George Grenier, Guillaume Thibault, Bernard McQuillen, P. Al. Artois, Alphonse Caron, Gaspard Lerou, Alcidas Archambault, Ludger Lafontaine, Joseph Montmarquette, Arthur Laviolette, Edouard Hétu, Alphonse Gervais, Félix Kertson, Pierre Lahaye, Duncan Robertson Fraser, Albert Venderhuyden.

The Board then adjourned until the following day at 10 a.m., for further business.

MONTREAL, 14th May, 1862.

The adjourned meeting took place this day, when were present:

Drs. Hall, Gilbert, Bibaud, Boyer, Robillard, Marsden, Jackson, Scott, Foster, Chamberlin, Jones and Peltier.

Dr. Hall in the chair.

Mr. Alexis Gaudreault, after satisfactory examination was allowed to enter upon the study of medicine.

Dr. R. Kerston, Graduate of the University of Berlin, received his license after having been sworn and passed the usual examination.

Dr. Marsden reported progress on the motion carried at the meeting in Quebec, respecting a biography of the late Dr. Joseph Morrin.

Dr. Jones proposed, seconded by Dr. Marsden:

"That Messieurs Smallwood, Fraser and Robillard, be a Committee for the formation of a "College Medical Benevolent Fund" to report at the ensuing triennial meeting."

It was also proposed by Dr. Marsden, and seconded by Dr. Boyer:

"That a Committee for the purpose of obtaining a Royal Charter for this College, do consist of the President, the Secretary for the District of Montreal, and Treasurer, and that they report at the ensuing triennial meeting."

The President then made certain remarks upon the petititions of Moïse Mitivier and Charles Foster, now before the Legislature.

It was then resolved by Dr. Jones and seconded by Dr. Bibaud.

"That Dr. Marsden, be deputed to place himself in communication with the Executive Council, on behalf of the College of Physicians and Surgeons of Lower Canada, for the purpose of requesting the Legislature to abstain from further action on the bills of Moïse Mitivier and Charles Foster, until this College is made aware of the grounds upon which they have founded their petitions; this College believing them to be in direct violation of its rules and regulations which "have been approved and allowed by His Excellency the Governor General."

There being no other business to be transacted, the Board then adjourned.

HECTOR PELTIER, M. D., EDINBURGH,
Secretary of the College of Physicians and Surgeons, District of Montreal.

CONVOCATION OF McGILL UNIVERSITY.

The annual convocation of this University was held on the 5th and 6th inst. The proceedings of the first day having been confined to the Faculty of Arts, those of the second to the Faculties of Medicine and Law. Our limited space compels us to notice those only of the Faculty of Medicine, as being of interest to our profession. We quote a portion of the proceedings from the *Montreal Herald:*

At 3 o'clock on the 16th, the Meeting of Convocation, adjourned from Monday, was resumed in the McGill Normal School, the proceedings on this occasion relating principally to the Faculties of Law and Medicine. The Hall was crowded to excess.

Andrew Robertson, Esq., M.A., a Governor of the University, occupied the Chair.

On the dais were seated, Principal Dawson, L.L.D., F.G.S.; Rev. Vice Principal Leach, D.C.L., LL.D., Dean of the Faculty of Arts; Prof. G. W. Campbell, M.A., M.D., Dean of the Faculty of Medicine, and Prof. F. W. Torrance, M.A., representing the Faculty of Law, in the absence of the Dean, Prof. Abbott, M.P.P. On either side of the dais, and throughout the Hall, we noticed the following members of Convocation:—Fellows, Thomas Walter Jones, M.D., and W. B. Lambe, B.C.L.: Secretary, Registrar and Bursar, W. C. Baynes, B.A. Officers of Instruction: Prof. Archibald Hall, M.D.; Prof.

Wm. Sutherland, M.D.; Prof. W. E. Scott, M.D.; Prof. Wm. Wright, M.D.; Prof. R. P. Howard, M.D.; Prof. the Rev. A. DeSola, LL.D.; Professor P. R. Lafrenaye, B.C.L.; Prof. D. C. McCallum, M.D.; Prof. Cornish, B.A.; Prof. Robt. Craik, M.D.; Graduates—Wm. H. Hingston, M.D., F. W. Campbell, M.D.; Dr. Austin, Senior; Dr. Robinson, Fusilier Guards. Louis Armstrong, B.C.L.; James Kirby, M.A., B.C.L. W. E. Bullock, B.A., John Boyd, B.A., Caleb S. DeWitt, B.A., and John R. McLaren, B.C.L.

The proceedings were opened with prayer by the Rev. Vice Principal Leach.

FACULTY OF MEDICINE.

Prof. Campbell, Dean of the Faculty of Medicine, made the following announcement:—

FACULTY OF MEDICINE McGILL UNIVERSITY, MONTREAL.

SESSION 1861–62.

The number of Matriculated Students in the past session was 159, of these 92 were from Canada East, 62 from Canada West, 1 from Nova Scotia, 1 from New Brunswick, 2 from Prince Edward's Island, and 1 from the United States.

The number of Students who passed the primary Examination, which includes the branches of Anatomy, Chemistry, Materia Medica, and Institutes of Medicine, was 22, as follows:—

Messrs. Alphonse Brodeur, Varennes, C.E.; Henry Graham, Balls Corners, C.W.; Eli Ives, Hatley, C.E.; Sinkler Gilbert Edward, Brockville, C.W.; Alex. A. Ferguson, Cornwall, C.W.; Wm. Gustin, London, C.W.; Donald J. Grant, Glengary, C.W.; John J. Marston, L'Orignal, C.W.; James H. Sawyer, Kemptville, C.W.; Horatio C. Burritt, Smith's Falls, C.W.; Wm. W. Dickson, Pakenham, C.W.; Robert McIntosh, Newcastle, C.W.; Antoine Desaulniers, Rivière-du-Loup, C.E.; Charles H. Pegg, Arcona, C.W.; Thomas M. Ross, Lancaster, C.W.; James L. Mason, Montreal, C.E.; Peter E. Brown, Lake of Two Mountains, C.E.; George Wood, Frost Village, C.E.; Wm. W. Gordon, Bathurst, C.W.; Wm. W. Squire, Montreal, C.E.; Edward E. Malloch, Ottawa, C.W.; Honore Thérien, Rivière David, C.E.

The oath of graduation having been administered by the Registrar, Dr. Hall, the following twenty-three gentlemen received the Degree of M.D., C.M.

(The following list contains the names of the graduates and of their Inaugural Dissertations or Theses.)

Charles Richard Nicols, Montreal, Surgeon, Royal Grenadier Guards, on Rheumatic Fever; John Edward Moffatt, Montreal, Staff Surgeon, Guards, on Gout; Henry G. H. Lawrence, Montreal, Asst. Surgeon, Grenadier Guards, on Typhoid Fever; Arthur G. Elkington, Montreal, Asst. Surgeon, Scotch Fusilier Guards, on Pneumonia; Edward Louis Lundy, Montreal, Staff Asst. Surgeon, on Syphilis; St. John Killery, Montreal, Staff Asst. Surgeon, on Idiopathic Tetanus; Robert Atkinson, Montreal, Staff Asst. Surgeon, on Diseases of the Liver; Thomas B. P. O'Brien, Montreal, Staff Asst. Surgeon, on Rheumatism; James Lister, Belleville, C.W., on Chronic Hydrocephalus; Frederic John Austin, Montreal, C.E., on Acute Peritonitis; Richard Maurice Bucke, Sarnia, C.W., on the Correlation between the Physical and Vital Forces; William S. DeBonald, Berthier, C.E., on the Philosophy of Respiration and the Pneometer; Edward Henry Trenholme, Trenholmeville, C.E., on the correlation between the psychical and physical actions; Charles Howard Church, Aylmer, C.W., on Strangulated Hernia; Francis Lewis Mack, St. Catherines, C.W., on Cancer; John Alexander Stewart, Charlottetown, P.E.I., on Epilepsy; David Beattie, Aylmer, C.W., on Bronchotomy; John Wherry, Quebec, C.E., on Hæmorrhage; Alfred Belleau, Quebec, C.E., on Anæmia; George Archbold Chesley, Cornwall, C.W., on Scarlatina; James Gordon Strowbridge, Brantford, C.W., on In-

flammation; Donald Peter Campbell, Glengary, C.W., on Epilepsy; John Harkness, Matilda, C.W., on Hydrophobia. Francis Winniett Digby, Brantford, C.W., passed his examination, but not being of age, could receive his Degree till next Convocation.

PRIZES.

The three prizes granted by the Governors were awarded as follows:—

For the best Thesis, Richard Maurice Bucke, Sarnia, C.W.

For the best Examination on the Final Branches, John A. Stewart, Charlottetown, Prince Edward's Island.

For the best Examination on the Primary Branches, John J. Marston, L'Orignal, C.W.

The Professor's Prize in Materia Medica was awarded to Mr. John Wm. Bligh, Quebec.

The Professor's Prize in Clinical Medicine, for the best answers to written questions, to Edward H. Trenholme, Trenholmeville, C.E.; and for the best report of cases to Richard Maurice Bucke, Sarnia, C.W.

In Botany and Zoology the prizes awarded were:

For Botany and Zoology to Mr. Timothy Bigelow, Whitby, C.W.

For Botany to Mr. Edward P. Hurd, Eton, C.E.

For Zoology to Mr. Kenneth Reid, Huntingdon, C.E.

The Prizes having been presented, the Degree of Doctor of Medicine and Master of Surgery was conferred by the Principal upon the 23 gentlemen named above.

Charles Howard Church, M.D., on the part of the graduates, delivered the parting address, which was couched in most eloquent terms. He was finally followed by Prof. McCallum, who in most appropriate language, and admirably suited to the occasion, delivered to the graduates their final instruction in regard to the duties and amenities of professional life. It is to be hoped that the injunction therein given will not be thrown away, as it is much to be regretted that a graduate *has* descended from the high position which he occupied, and for the sake of a few dollars, has preferred the position of the charlatan. It is a subject of regret that the college, has in the meanwhile, no power whatever, over a party who thus prostitutes his profession, and desecrates the solemn vow deliberately made and subscribed at his graduation.

UNIVERSITY INTELLIGENCE.

We have learned with great pleasure, that at a late meeting of the Governors, T. Sterry Hunt, Sc. D., A. M., F. R. S., was appointed to the chair of Applied Chemistry and Mineralogy now created in the Faculty of Arts. To use the language of a city contemporary, "while the eminent qualifications and high reputation of Dr. Hunt shed lustre on this new chair, the University has conferred an important benefit on the country, and especially on this city, in placing within the reach of young men entering on those professions in which a knowledge of practical chemistry is of importance, advantages which they have heretofore been obliged to seek abroad. There can be no doubt that in this great centre of manufactures and medical education, a large number of students will be found ready to avail themselves of the means of scientific training thus offered.

It is proper to add that the University is enabled to extend it usefulness in this direction, chiefly through the liberality of two of its friends—William Molson, Esq., who has erected the Laboratory building, and another gentleman, who

for the present withholds his name, who contributes the salary of the Chair —leaving merely the apparatus and incidental expenses to be provided for by the University.

The present appointment does not interfere with the Professorship of Chemistry in the Medical Faculty, so long and efficiently held by Dr. Sutherland. Dr. Hunt's duties being limited to the students in Arts and to special students in Practical Chemistry; while the removal of Mineralogy from the Chair of Natural History will enable Dr. Dawson to devote himself more exclusively to other departments of that extensive subject, thus rendering the course of Natural Science in McGill University one of the most complete to be found anywhere. Dr. Hunt retains his connection with the Geological Survey of Canada; and in adding thereto the function of a public teacher, only conforms himself to the established practice of the officers of the Geological Survey of Great Britain."

TORONTO MEDICO-CHIRURGICAL SOCIETY.

The second ordinary meeting of the year was held in the Society's rooms on Tuesday evening, April 8th. The attendance was numerous. The President occupied the chair and proceeded as soon as the usual business of the Society was over, to deliver a very able inaugural address. An animated discussion ensued and was prolonged far into the night. After a hearty vote of thanks to the President the meeting separated.

ERRATA IN DR. GRANT'S PAPER.

We regret that some errors of magnitude have occurred in Dr. Grant's paper on the employment of the Tincture of the Boletus Laricis Canadensis in Acute Rheumatism. In a private letter pointing out these errors, the author in addition remarks, that "within the last few weeks some most marked cases have come under my charge, and in every instance terminated favourably in a few days." As Dr. Grant has kindly offered to send us some of the Agaric for trial, an offer which we gladly accept for the sake of such cases in private and Hospital practice, we should at the same time wish to be furnished with the formula for the preparation of the Tincture, the omission of which was doubtless an oversight in the paper.

The following however are the corrections. In cases 1 and 2 in the formula for the exhibition of the Tincture, instead of Aquæ Puræ ℥ ij, read ℥ vij; and in case 6, instead of Tinct. Fung. Lar. Canad. ʒ iss read Tinct. Fung. Lar. Canaden. ℥ iss. These are important mistakes, and we regret that they occurred. They will occur in the best regulated families, as Dr. Grant is by this time fully aware.

BIRTHS AND DEATHS.

BIRTHS.

At Clarenceville, on the 10th inst., the wife of J. J. B.Dupuis, M.D., of a son.

DEATHS.

At Clarenceville, on the 10th inst., three hours after its birth, the infant son of J. J. B. Dupuis, M.D.,

At L'Orignal, U. C., on the 16th April, in the 45th year of his age, Dr. Angus Murray, of apoplexy, a native of the Isle of Skye, Scotland.

At Au Sable Forks, N. Y., on the 1st instant, aged 40 years, Mary, wife of F. G. D'Avignon, M.D., late of St. Johns, C. E., and Surgeon of the 96th U. S. Infantry. The melancholy part of this narrative consists in the fact that Dr. D'Avignon only left to join his regiment at Fortress Monro, a fortnight previous to the casualty, when she was in perfect health.

ABSTRACT OF METEOROLOGICAL OBSERVATIONS AT *MONTREAL* IN APRIL, 1862.

By Archibald Hall, M.D.

Day.	DAILY MEANS OF THE: Barometer corrected and red'd to F. 32°	Temper'ture of the Air.	Dew Point.	Relative Humidity.	Ozone.	CLOUDS: Amount.	CLOUDS: General description	THERMOMETER: Maximum read at 6, P. M.	THERMOMETER: Minimum read at 7, A. M.	WIND: Its general Direction and Mean Force from 0 Calm to 10 Violent Hurricane.	RAIN AND SNOW: Rain in 24 h'rs read at 10, A.M.	RAIN AND SNOW: Snow in 24 h'rs read at 10 A.M.	RAIN AND SNOW: Total rain and melted snow.	GENERAL OBSERVATIONS.
	Inc's.	°	°	0. 100	0. 10	0. 10		°	°		0. 10	Inch.	Inch.	
1	30. 171	37. 9	33. 7	.85	7. 5	10. 0	Cu. St.	44. 4	31. 3	N.	1. 0	.....	Insp.	0. 22	
2	30. 130	40. 7	32. 2	.72	7. 5	9. 0	Cu. St.	47. 2	31. 5	S.E.	3. 3	.....	.....	.....	Solar Halo. Rain with hail &
3	29. 839	41. 3	33. 9	.77	9. 0	8. 3	Cu.	48. 8	34. 6	S.W.	3. 0	0. 04	.....	0. 04	distant lightning midnight.
4	30. 223	32. 7	26. 1	.77	5. 0	0. 0	00	39. 0	20. 7	S.S.W.	1. 3	0. 05	.....	0. 05	Zodiacal light. Fringilla me-
5	29. 874	26. 5	20. 6	.80	6. 5	7. 6	Nimb.	39. 2	15. 8	S.E.	1. 6	.....	.....	.....	lodia first heard.
6	29. 927	35. 2	28. 1	.75	5. 5	7. 0	Cu. St.	42. 0	32. 0	W.	2. 3	.....	3. 40	0. 57	
7	30. 177	25. 3	16. 7	.68	4. 0	0. 0	00	33. 0	16. 0	N.N.E.	1. 0	.....	.....	.....	Faint Auroral light.
8	30. 174	26. 1	16. 0	.64	3. 5	2. 6	Cir. St.	33. 2	11. 8	N.N.E.	1. 6	.....	.....	.....	Lunar Corona.
9	30. 060	27. 8	18. 3	.68	2. 2	0. 0	00	34. 6	13. 5	N.	2. 0	.....	.....	.....	
10	30. 175	33. 5	21. 4	.61	3. 5	2. 6	Cir. St.	43. 8	22. 0	N.E.	1. 0	.....	.....	.....	Fine Aurora.
11	30. 384	38. 1	27. 2	.67	1. 5	0. 0	00	43. 0	27. 0	N.N.E.	1. 0	.....	.....	.....	[for last time.
12	30. 389	39. 5	26. 2	.59	1. 0	0. 0	00	48. 0	31. 0	N.E.	1. 0	.....	.....	.....	Two sleighs to St. Lambert
13	30. 251	41. 7	27. 2	.60	1. 5	0. 0	00	49. 0	26. 3	Calm.	0. 0	.....	.....	.....	Swallows (Hirundo pur-
14	30. 194	43. 3	33. 4	.75	5. 0	8. 0	Cu. St.	54. 5	26. 2	S.E.	1. 0	.....	.....	.....	pured) first seen.
15	30. 347	47. 7	38. 9	.78	6. 5	6. 6	Nimb.	55. 2	37. 4	Calm.	0. 3	0. 11	.....	0. 11	Aurora with streamers.
16	30. 226	50. 6	43. 8	.81	6. 5	4. 6	Cu. St.	63. 0	39. 0	S.	1. 0	.....	.....	.....	
17	30. 001	57. 0	49. 7	.78	5. 5	4. 0	Cir. St.	82. 0	44. 6	S.W.	1. 3	.....	.....	.....	
18	29. 867	55. 0	46. 8	.74	8. 0	9. 0	Cu. St.	69. 5	46. 0	S.S.W.	1. 3	.....	.....	.....	Faint Solar Halo A.M.
19	29. 899	48. 6	35. 4	.70	6. 5	6. 0	Cu. St.	71. 3	41. 3	W.	4. 0	0. 14	.....	0. 14	
20	30. 096	41. 2	33. 0	.75	5. 0	6. 0	Cu.	51. 0	36. 0	S.W.	1. 6	.....	.....	.....	
21	30. 017	54. 4	40. 1	.83	8. 5	10. 0	Cu. St.	58. 0	33. 0	E.	2. 0	.....	.....	.....	
22	29. 518	45. 3	42. 8	.93	9. 5	10. 0	Nimb.	51. 0	37. 0	N.E.	1. 6	0. 20	.....	0. 20	Fog at 4.30 p.m. for an hour.
23	29. 617	41. 0	36. 1	.88	9. 5	9. 3	Cu. St.	58. 0	33. 0	W.	5. 3	0. 12	.....	0. 12	First steamer in Port from
24	29. 956	32. 3	26. 8	.81	5. 5	6. 6	Nimb.	46. 0	25. 5	W.N.W.	3. 0	.....	Inap.	0. 01	Winter quarters.
25	30. 203	38. 7	26. 9	.64	6. 0	0. 0	00	46. 5	26. 8	S.W.	1. 3	.....	.....	.....	Ice formed on fools.
26	30. 303	41. 5	30. 8	.65	5. 0	3. 3	Cu. St.	50. 4	29. 8	E.N.E.	1. 0	.....	.....	.....	
27	30. 350	47. 5	29. 5	.51	4. 2	5. 6	Cirr.Cu.St.	57. 0	32. 0	N.N.E.	1. 3	.....	.....	.....	
28	30. 103	46. 3	38. 2	.73	9. 0	10. 0	Nimb.	50. 6	42. 8	S.S.E.	3. 3	0. 03	.....	0. 03	First Steamer to Quebec.
29	29. 988	48. 4	40. 4	.76	6. 5	7. 6	Cu. St.	58. 0	42. 0	W.	1. 0	0. 04	.....	0. 04	
30	30. 085	52. 4	39. 4	.65	4. 5	2. 3	Cu.	60. 2	38. 5	S.W.	1. 3	.....	.....	.....	
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
S's	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0. 73	3. 40	1. 52	
M's	30. 085	41. 02	32. 34	.734	.....	.....	.....	59. 92	30. 81	.....	.....	.....	.....	.....	

ABSTRACT OF METEOROLOGICAL OBSERVATIONS AT *TORONTO* IN APRIL, 1862.

Compiled from the Records of the Magnetic Observatory.

Day.	DAILY MEANS OF THE: Barometer reduced to 32° Fah.	Temperature of the Air.	Relative Humidity.	Amount of Cloudiness.	THERMOMETER: Max'm read at 6, A.M. of next day.	THERMOMETER: Min'm read at 2, P.M. of same day.	Dew Point at 3, P.M.	WIND: General Direction.	WIND: Mean Velocity in Miles per hour.	RAIN AND SNOW in 24 hours, ending at 6 A.M. next day: Rain.	Snow.	Total rain and melted Snow.	Ozone in 24 hours ending 6 A.M. of next day.	GENERAL REMARKS.
	Inches.	°	0—100	0—10	°	°	°				Inch.	Inch.	0. 10	
1	29. 8888	34. 23	83	4	39. 6	30. 4	32. 0	N. 50 E.	5. 77	.....	.....	.....	.....	Faint Aurora.
2	.4337	39. 27	80	9	45. 7	29. 8	35. 0	S. 62 E.	15. 58	.010	.....	.010	.....	Thunderstorm first of season
3	.7447	40. 25	72	8	45. 4	34. 2	34. 0	N. 77 W.	10. 24	.....	.....	.....	.....	Faint Aurora.
4	.7842	32. 30	81	9	36. 0	31. 6	25. 0	N. 86 E.	15. 90	.....	0. 1	.010	.....	
5	.3783	36. 40	79	9	41. 8	30. 4	31. 0	S. 87 W.	12. 51	.355	0. 1	.365	.....	
6	.....	Sunday			35. 0	28. 8	.....	N. 69 W.	12. 03	.....	Inap.	Inap.	.....	
7	.8738	26. 17	82	7	31. 2	14. 5	23. 0	N. 72 E.	9. 41	.....	.....	.....	.....	Lunar Halo.
8	.6467	29. 90	79	10	32. 2	26. 2	25. 0	N. 80 E.	19. 99	.....	.....	.....	.....	
9	.5765	33. 22	69	10	36. 8	29. 0	21. 0	N. 72 E.	11. 17	.....	.....	.....	.....	Lunar Halo.
10	.9007	35. 67	70	0	43. 0	28. 1	31. 0	N. 32 E.	5. 00	.....	.....	.....	.....	Aurora.
11	30. 0923	37. 08	66	1	46. 4	30. 0	24. 2	N. 20 E.	4. 79	.....	.....	.....	.....	Lunar Halo.
12	30. 0167	39. 73	53	4	45. 2	30. 0	22. 0	N. 85 E.	10. 42	.....	.....	.....	.....	
13	.....	Sunday			45. 8	36. 0	.....	N. 77 E.	6. 99	.020	.....	.020	.....	
14	29. 7922	46 37	79	9	57. 0	39. 8	45. 5	N. 88 E.	4. 18	.....	.....	.....	.....	Swallows seen.
15	.8393	49. 25	82	6	55. 4	40. 5	46. 0	N. 81 E.	6. 17	Inap.	.....	Inap.	.....	Faint Aurora.
16	.7210	54. 32	79	9	66. 8	44. 5	49. 0	S. 67 E.	3. 34	.005	.....	.005	.....	{ Solar Ha. distant thunder
17	.7472	56. 85	82	10	68. 0	51. 4	57. 0	N. 89 W.	6. 93	.130	.....	.130	.....	{ Lunar Halo.
18	.....	.....	.....	.....	57. 0	45. 2	.....	N. 74 W.	8. 98	.115	.....	.115	.....	
19	.7725	41. 30	68	8	47. 8	37. 0	38. 0	N. 49 W.	7. 82	.....	.....	.....	.....	
20	.....	Sunday			44. 8	35. 0	.....	N. 87 E.	7. 48	.....	.....	.....	.....	
21	.4310	37. 40	89	10	38. 8	34. 6	36. 0	N. 82 E.	18. 95	1. 555	.....	1. 555	.....	
22	.1673	39. 83	87	10	48. 0	36. 6	43. 5	N. 64 W.	14. 04	.020	.....	.020	.....	
23	.5947	31. 12	84	5	33. 8	28. 0	24. 0	N. 68 W.	18. 11	.....	Inap.	Inap.	.....	
24	.8005	35. 92	59	1	46. 0	29. 2	30. 0	S. 55 W.	9. 84	.....	.....	.....	.....	Thick ice A.M.
25	.8878	35. 00	58	5	43. 2	27. 8	11. 0	N. 85 E.	5. 37	.....	.....	.....	.....	
26	.9767	39. 87	56	4	48. 0	27. 9	24. 0	S. 87 E.	5. 40	.....	.....	.....	.....	
27	.....	Sunday			49. 0	35. 0	.....	N. 76 E.	8. 07	.....	.....	.....	.....	Solar Halo.
28	.6140	48. 10	70	9	56. 4	41. 5	41. 0	S. 81 W.	10. 76	.025	.....	.025	.....	
29	.7627	43. 97	57	4	52. 2	39. 4	23. 0	N. 38 W.	9. 54	.....	.....	.....	.....	
30	.7023	45. 45	61	3	54. 0	30. 5	35. 0	N. 87 E.	7. 77	.....	.....	.....	.....	Solar Halo.
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
S's	.....	.....	.....	.....	.....	.....	.....	.....	.....	2. 235	0. 2	2. 255	.....	
M's	29. 7258	39. 56	73	7	46. 34	33. 43	32. 24	N. 50 E.	9. 75	.....	.....	.....	.....	