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ART. XXXI.—*Sketches of the Endemic Fever of Upper Canada, and of the Effects of its Climate on European Constitutions*, by JOHN JARROX, Surgeon, Dunnville.

[CONCLUDED FROM OUR LAST.]

After what has already been said of the character of congestive fevers it would be out of place in such a sketch as this to give a detail of all their varieties, and the appearances they exhibit. For these I must refer to the writings of the lamented Armstrong, Dr. Wood's Practice of Medicine, containing the best articles on malarious fevers I have found in any system, and the more concise and pithy reports of the British Naval Surgeons on the diseases of the West Indies, to be found in Dr. Jas. Johnson's Work, and the pages of the Medico-Chirurgical Review particularly; those of Dr. Dickson and Mr. Waller on the Mariegalante Fever. I will confine myself to such modifications as are common in Canada.

The tendency to congestion may be detected in the state of the bilious arrangement. The look of a patient will be unusually haggard, the upper tarsi depressed and eyes listless; the usual pains and aches little complained of except perhaps in the lumbar vertebræ and coccyx, the prostration of strength and tendency to perspiration on exertion will be great, and attended with something like syncope; the drowsiness and tendency to sleep in the afternoon more marked; and the following sensations, so well described by Dr. Wood, I have often seen in others, and felt when going about and attending to

business:—"Usually the paroxysms begin with simple drowsiness, the patient forgets quickly what he may have done, said or desired; stops, when speaking, in the middle of a sentence, or uses one word for another, and often stammers."

These symptoms are not confined to the derangements preceding a first attack of fever, but can as readily be detected in those which may follow, as the subsequent derangements and ague generally put on the variety of the preceding fever. Such symptoms frequently pass into what has been called the "comatose intermittent," sometimes complete in the first attack; but this may be slight and the second and third more severe. The history of the case, the appearance of the patient lying stretched out at length, and not huddled up as in common ague; the sunken countenance, the state of the skin, often hot, soft, and moist, or if dry in one part covered with perspiration in another, and those alternating, so that we may have all three stages of fever present on the body at the same time—the pulse soft and rather small, but frequently full and firm, though yielding readily under the finger, and altered by the changing state and motion of the patient, profuse but partial perspirations breaking out, especially about the head and neck, are some of the leading characteristics.

This state is often well exemplified in stout flabby children under ten years of age. In them the attack is usually sudden and attended with convulsions,

and may, for an hour or two, put on a very inflammatory appearance; but the pulse then becomes soft, partial moisture come out on the skin, and the real nature of the affection is manifested by its course, and will gradually be more slight in subsequent paroxysms, as the secretions are restored to a healthy state, and be ultimately stopped by a single dose of quinine. Such attacks are frequently preceded for days by startings, disturbed sleep, and other head symptoms, and are capable of being arrested in this stage. They frequently put on much of the appearance of epileptic fits, recurring regularly like ague, and continuing occasionally for months or even years; their real nature being easily decided by their history and the effects of treatment. I have seen the same convulsions and epileptiform fits at the commencement of the disease in adults, but more rarely, unless where fever and delirium tremens are combined, which will be afterwards noticed.

A remittent fever, when fairly formed may also show a tendency to many of the preceding symptoms; the patient making little complaint, but appearing oppressed and to be laboring under some affection of the head; or more than usually restless, with general irritability but always with great prostration of strength. The pulse may be full but without decided strength, but often rather small and irritable, and always exceedingly variable; the tongue either contracted, dry and red, with a harsh, dry skin; or much coated and moist, with perspiration; the paroxysms of fever always irregular, frequently occurring in the night, and the stages imperfectly developed. The excretions very offensive, and often of a red color, dying everything they touch of a deep yellow; those from the bowels approaching an orange tint, which is almost as charac-

teristic of the state of depression in congestive fevers, as the rice-water discharges are of cholera. The mucous linings may become affected in time, and aphæ appear in the mouth and fauces, when the fever will become almost continued, attended by the usual typhoid symptoms. The brain, from the first, will appear muddled, and delirium will occasionally show itself; and very often a train of symptoms resembling those already mentioned in the quotation from Dr. Wood's work:—"The intellect will be at times exceedingly clear and the fancy vivid, but the patients will always be found incapable of directing their attention for any length of time to a particular object, or of attending to the least business arrangement."

Attacks of mania during the continuance of these fevers are by no means unfrequent. I once had three cases at the same time within a few hundred yards of each other. They usually subside with the fever, but form a troublesome complication that always protracts it.

Maniacal symptoms will also show themselves in the state of bilious derangements preceding and following these fevers. In the first state, uneasy fullness and weight in the head will be complained of, but the general history of the case, and the slightly bilious and depressed look of the patient, may be all to guide us to the true cause of the mental malady. The bowels will generally be found sluggish, the secretions unnatural, and the skin dry. The effects of calomel purges and quinine will be decided; either ague or aguish perspiration soon after being recognised, and the patient relieved for a time, but the whole train of symptoms may return in a greater or less degree with the bilious derangements of the season.

The same affections occurring after a fever are still more troublesome. They are rarely attended by regular ague; but the patient does not regain his appetite and flesh, looking ghastly and exceedingly miserable, though it will be impossible to detect any organic affection. The skin will usually be dry, and when perspiration does come out, the smell will be offensive; the tongue generally clean, red and moist, becoming coated with every attack of fever; and these, though of a paroxysmal character, are never regular. The bowels will be irregular, usually sluggish; the stools dark brown, viscid and tending to black, and offensive; the color of the urine will vary, and the aguish smell may be detected about the patient and his clothes. He will generally be found exceedingly listless and unwilling to leave his bed or the side of the fire, passing restless and sleepless nights.

The mental affection will vary—often to be detected only in the changed habits and dispositions of a patient to the most furious and decided maniac; attended by depraved secretions, fits of paroxysmal fever, and great depression and sinking; the patient lying for hours in an exhausted state, covered with perspiration, with cold extremities, and scarcely a pulse to be felt.

In cases of this variety of fever, attended from the first with irritability and restlessness, I have seen epileptic fits supervene in the course of the disease, the effects of which are very peculiar. The pulse of the patient and his heat of skin will sink with each fit, the former being scarcely to be felt, and the hands and extremities becoming cold and covered with a clammy perspiration; these will both regain their ordinary state after a time only to lose it again with each subsequent fit; in fact, every fit being attended by a state

of collapse, while red dry tongue, picking at the bed clothes, and other typhoid symptoms always accompany them. The patient will be insensible during the fits and for some time after, but in the intervals delirium may not be present; the mental faculties being often little disturbed until towards the close of life, which is usually preceded by that gradual sinking and long-continued cold extremities so common in typhoid fevers.

The sudden alteration of the expression of the countenance after the occurrence of the fits deserves notice. The features sink, and the appearance of excessive old age becomes as decided as I have seen it in the worst cases of cholera. I once lost a lad of nineteen and an old man of eighty years of age in the same day with these symptoms: it would have been impossible to tell, from the expression of their countenances, sometime before death, which was the elder of the two.

At other times, when the unusual symptoms of the fever are little marked, we may suddenly find irritability and restlessness come on; the pulse become irritable and intermitting, with slight subsultus tendinum and perhaps some head symptoms. The subsequent attacks of fever will instantly vary, and put on the appearance of the most decided typhus, with sinking pulse, dry glazed tongue, muttering delirium, picking at the bed clothes, &c. &c.; often attended by vomiting of dark offensive matter, and always by discharges of depraved secretions from the bowels. This state may require the use of stimuli to prevent sinking from collapse; but the consequences to be dreaded are epileptic fits, or a train of low typhoid symptoms under which the patient will be carried off. It is often prevented, or speedily removed, by a judicious bu

free use of calomel, opium, purgatives, and quinine, when the fever will again assume its usual course: thus showing, by the evanescent character of the change, that it must have depended on some temporary state of the secretions or the blood, and not on any peculiar virus taken into the body and requiring time for its elimination; or any change of structure of the organs, or alteration of the mucous tissues or glands connected with them.

Another form of this fever is exemplified in the cases of the Pincket family, published in your Journal of November, 1849. There the skin was dry, the secretions dark and viscid, the head evidently affected, though the peculiar symptoms of it were not prominent, or the functions of the brain much deranged. In Charlotte's case the effects of calomel, purges, and of quinine, while the secretions remained in a morbid state, were seen, as well as of stimuli, which I there administered to a greater extent than I had ever done before, merely on account of the fatal tendency of the disease. Her countenance and skin lost their bronzed appearance, but none of the other symptoms gave way: and death would likely have happened in the same manner, irrespective of the affection of the throat. The suppression of the disease and the return of healthy secretions in two of the cases the instant mercurial ptyalism appeared, are to me decisive of the nature of the affection, and of the only mode of treatment at all to be depended on, as the effect of quinine was seen to be so uncertain while the secretions are depraved, and the tendency to fever is unchecked.

The morbid dissection reported is also valuable as occurring in an extreme case, the like symptoms being exhibited often without being followed by death; and in private practice the opportunities

are few of corroborating the diagnosis even in fatal cases. The most particular points seem to be the extent of the congestion of the vessels of the head with so little derangement of the functions of the brain; the normal state of the liver, lungs, and spleen, and of the peritoneal lining of the abdomen; the peculiar colour of the bile, and the secretions in the stomach and duodenum, and the offensive smell emitted, which prevented a more minute investigation.

The ochrey colour of the bile and secretions in the stomach is unusual. I have only seen it in one case besides, the history of which may have some bearing on my peculiar opinions in these cases.

In 1847, the wife of an emigrant in better circumstances, who came from Ireland about the time the emigrant fever was so fatal, but which the family escaped, was, after being some weeks here, seized with intermittent fever and bowel complaint, but which did not prevent her from taking a journey into the country for ten days or a fortnight, during which she suffered a good deal. I was called to see her two days after she got home, and found her in a state of perfect collapse, with much of the cholera expression of countenance, the extremities cold, pulse almost gone, and body covered with a clammy perspiration; there were no cramps and little pain of the belly, but great thirst and an incessant discharge of an ochrey coloured fluid, in no large quantity, from both the stomach and bowels, and that without pain or effort, as if squirted out by a sudden contraction of the tubes. I had recourse to calomel, opium, and stimulants, but relief was only partial, though the patient lived for three days. The ochrey coloured discharges became completely changed soon after taking the calomel, and she had discharged in the

same manner, a grass green matter exactly agreeing with the description of the chopped spinage discharges that were found in the typhoid fevers following attacks of cholera in this country.

This seems to be the place to notice that peculiar combination of the symptoms of malarious fevers with those of delirium tremens, and its effect in depressing the powers of life, which is so apparent. The class of symptoms to which the term delirium tremens is applied has so long been looked on as the effect of cerebral irritation requiring for its alleviation and cure the most powerful stimuli, that it would seem heterodox to question the proposition or to suggest a different mode of treatment. In 1830, when in China, I met with a decided case of malarious fever, combined at its very commencement with the symptoms of delirium tremens. It was with the utmost anxiety that I had recourse to the usual course of calomel and purgatives, and with a trembling hand that I dared to take ℥xx of blood. The effects of these were salutary rather than otherwise; but I suspended such unusual proceedings and had recourse to stimuli, though the stools were all along black, tarry, and offensive. After a severe attack my patient recovered, but the impression was left on my mind that the state of the secretions was a prominent cause of the peculiar affection, which was ultimately strengthened by the fact that I could always suppress the slightest tendency of the symptoms of the delirium to return by the free use of calomel purges, and which the state of the bowels at the time generally required; and that two years after the patient again got the fever at the same place, it was accompanied by precisely the same symptoms, and carried him off by inflammation of the brain.

In Canada I soon found cases of delirium tremens accompanied by the most decided symptoms of bilious derangement, with paroxysms of intermittent and remittent fevers, and exhibiting a set of symptoms scarcely to be met with in the usual descriptions of the disease, in the treatment of which I have every year departed more and more from the recognized routine, and had recourse to calomel, purgatives, and blood-letting.

The following extract that I lately met with in Rankin's Half-yearly Abstract of the Medical Sciences, for 1848, was to me exceedingly gratifying, tending as it does to support my own deductions and the unusual mode of practice I was following; and it cannot be without its value to the profession that individuals so wide apart should be observing with such different objects in view,—Mr. Corfe's being to determine the cause of delirium tremens under ordinary circumstances; and mine, without questioning the recognized course of the affection, being merely directed to a peculiar modification of malarious fevers occurring in hard drinkers, and those subject to attacks of delirium tremens, and in which the two diseases might be combined; and that the practice resulting therefrom is not only safe but successful.

Mr. Corfe states:—"It should be observed that every case of threatening delirium tremens is preceded by more or less biliary derangement; and, as these men rarely enjoy active or healthy secretions from their alimentary canal, it does appear, from the observations of a large number of cases in this hospital the disease is purely hepatic in its origin. This opinion is entertained by Dr. Seth Thompson, who has most successfully treated some of the worst cases of this disorder with large and repeated doses of calomel, followed by brisk ca-

thartics; and he has never been obliged to resort to opium at all, sleep having succeeded the active unloading of the hepatic system. It has long since struck my mind that the invasion of the disease springs from a sudden, or, it may be, a gradual poisoning of the blood, by means of a chemical alteration in the bile and urine; and that some of the elements of one or both of these secretions are carried through the circulation. My chief reasons for drawing these conclusions are the following—The disease has given way in a decided manner under sharp purgation with calomel, &c., and the improvement is invariably coexistent with the passage of numerous dark, offensive, and deeply-bilious evacuations. Again, a very large number of cases, and those of the worst form, present themselves with symptoms poison by urea. It is stated that they have had one or more fits; these fits are distinctly epileptic, and exactly resembling those attacks which sometimes occur in persons labouring under albuminous disease of the kidney, and in whom the disappearance of urea from the urine, and its presence in the circulating fluids have been repeatedly detected by Dr. Christison and others. In fatal cases of delirium tremens an epileptic fit is often the forerunner of death.”

It strikes me that Mr. Corfe is too limited in his views; that the poisonous state of the blood is brought about by the alteration of the bile and the urine; and that some of the symptoms he mentions may be caused by the presence of urea in it, resulting from the nearly complete suppression of urine in most of the cases. The adoption of them would tend to localise the affection in the liver and kidneys; while the vitiated state of the stomach and small intestines show an early alteration in the chyme itself, from which the blood is

directly derived in a state that even normal glands could not perform their usual functions.

I have seen in this disease the urine entirely suppressed for days without epileptic fits or the effects of urea in the blood being apparent; on the other hand, I have often seen these results occur instantaneously, and without the slightest chance of their being produced by such a cause; while the symptoms and course of the disease would tend to show that the vitiated secretions of the liver and kidneys were the effect of the state of the digestive functions resulting from the disease and the habits of the patient, whereby the blood submitted to the action of these glands is so changed that their secretions are altered, and a tendency to inflammation in their substance induced; just as we see exemplified in pyralism. Mercury enters the blood, the secretion from the salivary glands is changed, and an enlargement and inflammation of their substance takes place.

The functions of both the liver and kidneys are most important in preserving a healthy state of the blood; but we frequently see the bile, when secreted from normal blood, prevented by mechanical obstruction from entering the duodenum, and taken into the circulation by absorption without the bilious derangements of malarious fevers or delirium tremens being produced; and the urine may be retained in the bladder, or even not secreted for days, without the poisonous effects of urea being manifested. In Britain you often have most perfect jaundice from mechanical obstructions, without malarious fever; and I have seen a like cause produce the same result in malarious countries, and in parties subject to fevers, without a single symptom of them being present showing evidently that the state of the

blood must depend on some other cause than the increase or decrease of the secretion of the bile, or any temporary alteration in the state of the gland. Fevers being produced by a congested state of the liver and consequent alteration in the bile, and by inflammation of the membranes of the brain or mucous linings of the stomach, to which they are attributed by so many, were long stumbling-blocks in my way in arriving at the true cause of the disease. Each or all of these may be present without a fever of this class, as well as during the course of one, when observation will generally show them to be the result of previous derangement, and not the primary cause of the affection. We may be obliged to refer to these observations when speaking of dropsical affections with albuminous urine resulting from malarious fevers; this state of the urine constituting "Bright's Disease" being so often looked on as the result of a peculiar disorganization of the kidneys, but recent enquirers are questioning the deductions, as the state of the urine is frequently found without alteration of the kidneys, and ascribing both to the effect of altered blood, of which Bright supposes them to be the cause.

In this country, where the habit of drinking to excess is so frequent, the effect is soon perceived on the diseases of the climate. The oily skin, the perspiration and breath more than usually offensive, a white contracted and trembling tongue, a soft and intermitting pulse with some degree of subsultus tendinum, are indications of the habits of a patient, and occurring with bilious derangements may lead us to expect an attack of delirium tremens. These are frequent during the sickly season, occurring both after a debauch and with little alteration in the usual habits of a patient. The bilious symptoms are usually in

excess, requiring a free use of calomel and purgatives for their removal, and by which the peculiar state of the delirium is more effectually alleviated than by opium and stimulants.

In confirmed drunkards, whose habits have undermined their constitutions, the first we may hear of the disease will be the occurrence of an epileptic fit, and will find the patient with bilious derangements, the usual symptoms of delirium tremens, and in a state of nearly perfect collapse,—the breath and colour from the body most horribly offensive. The fits will recur in quick succession, sometimes two or three in an hour; I have known them continue, with slight intervals, for a week or ten days, the patient at last dying, with symptoms of inflammation within the head. At other times, occurring as frequently and lasting as long, accompanied by tetanic symptoms, perfect opisthotonos, from which the patient recovered: the disease becoming paroxysmal, and the patient ultimately sinking as if poisoned by his own secretions. Coma often appears on the second or third day, and the patient soon sinks. I saw one case with orange coloured discharges from the bowels; the depression was excessive, and the patient sunk exhausted in less than 24 hours, without either coma or affection of the brain.

The leading peculiarity is the disgusting odour issuing from the body, not confined to the excrements and breath, but steaming from every pore, rendering it often impossible to approach it without experiencing sickness at stomach, and producing the impression on those unaccustomed to the disease, that the patient's excrements for days were still kept under the bed. I once had a case with pectoral symptoms: the expectoration was as offensive as that found in gangrene of the lungs, though no such

state was present,—the odour being common to every other discharge from the body. When death is not the result of inflammation of the brain or coma, it usually happens suddenly when least expected.

We find many patients had recourse to drastic purgatives, and often to blood-letting, on the occurrence of the premonitory symptoms of these affections; the lancet may be freely used when the constitution is not completely broken down, and if neglected an apoplectic attack during a paroxysm of fever may result. Large doses of calomel and drastic purgatives will be required to bring about free discharges from the bowels, and may be repeated every second night until the secretions are restored, and the fever and delirium suspended. I have never entirely omitted the use of stimuli and opium, but only give occasional full doses as the symptoms might seem to require. I have also used camphor in large doses.

In the epileptic attacks the constitution of the patient and the state of collapse may prevent the abstraction of blood on the accession of the disease; but it must be watched, and the accession of an inflammatory affection at once suspended by a free bleeding, which I have even repeated, and blood will then be easily obtained, notwithstanding the partial state of collapse in which the patient may be. In all cases of congestion the patients ought to be bled in the horizontal position, and the effects of it on the constitution narrowly watched.

In the tetanic case, an individual in ordinary health dropped down in a fit and was picked up with collapse; the fits recurred, and symptoms of delirium tremens showed themselves. Mr. Allen, surgeon of the Royal Navy, saw him before my arrival, and could only get a

few ounces of blood from his arm. The disease went on increasing, and it was four or five days after that we found the anticipated inflammatory symptoms present. I at once took thirty ounces of blood from the arm, to which we attributed the safety of the brain and the ultimate suspension of the fits. The secretions never became healthy, nor did the disgusting odour leave the body. He died about three weeks after being bled, in the manner previously stated.

Dunnville, Aug. 1850.

ART. XXXII.—*A few Remarks on the Development and Structure of the Human Teeth, with an Enquiry into the Cause of Dental Caries.* By R. M^cLIMONT, D.D.S., Quebec.

Almost every age of the world's history has been signalized by some valuable discovery in science or art; but the present is emphatically one of *investigation*. Men of every nation have investigated most closely that department of science peculiarly their own. The result has been most satisfactory—truth has been elicited, facts have been established, and many things hitherto considered facts, proved to be hypotheses and chimeras.

In no department of science has the result been more satisfactory than in the medical. Physiologists, with a most laudable curiosity, have scrutinized the motions of the beautiful machine, and almost revealed to our astonished vision the secret springs of life itself. Pathologists have presented us with morbid specimens of almost every disease that flesh is heir to, and in almost every stage.

We are not now in doubt as to the cause of the vexatious cough which is too surely the precursor of that melancholy disease, pulmonary consumption; dissection shows it to be attributable to the presence of tubercles in their form-

ing stage. Nor are we left to conjecture as to the cause of the profuse expectoration and hemorrhage of the more advanced stage: ocular demonstration has likewise shown these tubercles broken down, and blood vessels ruptured by their ravages.

Chemists, too, have analysed the gases, and put us in possession of means to counteract their injurious tendencies. They have determined the exact proportion of the constituents of bone, blood, and muscle. They have made their knowledge subservient to the health and happiness of man, the amelioration of the brute creation, and even agriculture itself.

But much remains to be learned—man has not yet reached the *ne plus ultra* of scientific research, and to an end so desirable, so fraught with interest to the well-being of our fellow creatures, let each one lend himself, and by close observation contribute his share to the establishment of general facts and principles.

The teeth regarded as they are by all, as very important organs of the human body, have come in for a certain amount of scientific observation. Good-sir, Arnold, Blake, Fox, Nasmyth, Harris, and many others have not thought it beneath them to consecrate varied and brilliant talents to the investigation of this subject. We have had elaborate and interesting treatises written on the structure and formation of these organs, and many able disquisitions on the diseases to which they are subject. Caries being by far the most frequent of these, I would desire in this paper to call more general attention to it, in the hope that by stating the opinions of the most eminent dental pathologists, and the few facts I have observed in my own experience, I may induce others to do the same, the result of which will be

the recognition of *general principles*, whereby we may be enabled to interpret accurately the phenomena of dental disease, and pave the way to still greater improvements in dental surgery.

But, in order rightly to understand the cause and treatment of this disease, it may be well to see that we are fully acquainted with the structure and formation of the organs themselves. Fortunately the researches of the **achromatic** microscope have thrown much light on the subject; indeed, hardly anything remains to be desired.

As early as the year 1678, Leuenhoch described the human tooth as made up "of very small, straight, and transparent pipes, and he calculated that the number of these pipes in a single molar amounted to five millions."!! Subsequent investigation has proved the correctness of his investigations, and moreover that these tubuli do not traverse the spaces between the successive layers, as in ordinary bone, but are originated from the pulp cavity, and radiate outwardly, having their long axis corresponding with the course of the tooth fibre.

The diameter of these tubuli at their radiating point is about 110,000th of an inch, but they become much smaller as they radiate towards the surface.

As every one knows the teeth are composed of animal and mineral substances in intimate union, the earthy components are secreted by the red portion of the blood, while the mucilage which goes to form the animal proportion is derived from the white or serous part. According to Berzelius, an analysis of 100 parts of dentine gave the following constituents:—

Phosphate of Lime	62.
Fluate of Lime	2.
Carb. of Lime	5.5

Phos. Magnesia	1.
Soda	1.5
Gelatine	26.

but these proportions, it is almost needless to say, vary in almost every case, according as the teeth are hard or soft, the earthy constituents being found in much greater abundance in the former than in the latter.

Although the ossification of these organs does not begin to take place till about the fifth month of intra-uterine existence, their rudimental formation in the jaw is observable at a much earlier period. Mr. Goodsir, in a paper on this subject, published in the Edinburgh Medical and Surgical Review of January 1839, says that he commenced his microscopic investigations in an embryo of the 6th week, at which period "he observed a groove formed by two semi-circular folds of mucous membrane extending around each jaw; as this widens from behind forwards, a ridge running in the same direction rises from its floor and divides the original groove into two others. The *outer* one forming the duplicature of mucous membrane from the inside of the lip to the outside of the alveolar processes." The inner one he calls "the *primitive dental groove*, in which the germs of the future teeth make their appearance.

At about the 7th week after conception the first temporary molaris makes its appearance in the bed of this groove in the shape of a "free granular papilla of an ovoidal form," the long diameter of which is antero-posterior. By the 8th week the temporary cuspidatus is observed in like manner; by the end of the 9th week the germs of the incisores appear. During the 10th week the 2nd temporary molaris is observable, thus completing the deciduous set of teeth.

The sides of the groove now gradually approach each other, forming a

follicle which invests each tooth. The papilla of the respective teeth now begin to assume a particular form, the incisores that of the future teeth: the cuspidati become simple cones, and the molares flatten transversely.

At this period (the 14th week) the primitive dental groove contains the germs of the temporary teeth. This groove is now situated higher up in the jaw than before, and may now, says Mr. Goodsir, "be denominated the *secondary dental groove*, from the fact that it is here that provision is made for the production of the permanent teeth."

This is brought about, says our author, by "a depression of a crescent shape immediately behind the inner opercula of the follicles." The opercula in the mean time close the mouths of the follicles, but without adhering to them, beginning with the central incisores, then with the lateral, then the cuspidati, and so on to the second molares.

The *secondary groove* being now closed up, the follicles are converted into sacs, the papillæ into the pulps of the temporary teeth, and the crescent formed depressions into *cavities of reserve*, from which the pulps and sacs of the permanent teeth are produced.

An intervening space is now observable between the pulps and the sacs, in which is deposited a "gelatinous granular substance," which at about the 5th month of gestation is found to have extended over the whole of the interior of these organs, and is believed to be destined for the formation of the enamel, which interesting process will shortly come under notice.

The outer membrane of this sac is plentifully supplied with blood from small twigs sent off from the dental arteries, which anastomosing "ramify on the entire surface of the membrane."

The eminences of the temporary teeth having now become vascular, begin to ossify; layer after layer being deposited *from without inwards*, or from the surface to the centre of the tooth, in this respect differing from the formation of the other bones of the body.

The before-mentioned cavities of reserve are now observed above and behind the temporary teeth imbedded in the maxillary tuberosity, they soon acquire the appearance of dental pulps, and "remain in this position until the lengthening and irruption of the temporary teeth, when they gradually recede and insinuate themselves between the temporary teeth, until they are only connected by their proximal extremities, through the alveolo-dental foramina, or *itineria-dentium* of Delabarre."

Dentine is covered by a hard and beautifully polished substance called enamel. This invests the crown and neck of every tooth, and materially protects the subjacent osseous tissue from the action of injurious agents. The earthy salts greatly predominate over the animal matter in the enamel. The following is an analysis of 100 parts:—

Phosphate of Lime.....	85.3
Fluate of Lime.....	3.2
Carb. of Lime.....	8.
Phos. Magnesia.....	1.5
Soda.....	1.
Animal Matter.....	1.

According to Goodsir, Raschkow, and Nasmyth, three of the most eminent authorities on this subject, the enamel is formed from the gelatinous granular substance before mentioned, and which is situated between the follicle and the tooth germ, the latter of which it closely envelopes. This granular substance is surrounded by a fluid which Raschkow says bears a striking resemblance to the liquor amnii, and which, by a peculiar unknown process, is transformed

into a membrane which attaches itself to the pulp.

According to this author the inner surface of this membrane consists of an infinite number of short fibres, each of which he considers an excretory duct, whose function it is to secrete "the enamel fibre corresponding to it."—These fibres, at a certain point in the ossification of the dental pulp, begin to secrete the earthy salts which chiefly make up this substance. This membrane is believed to be the bond of union which exists between the enamel fibres and the bone of the tooth.

The enamel fibres are of an hexagonal form, and radiate from the centre to the surface of the tooth. The cells of the enamel, says Mr. Nasmyth, "are of a semicircular form, and the convexity of the semicircle looks upwards towards the free external portion of the tooth." These cells are arranged in undulating curves, thus securing infinitely greater strength and resisting power than if they were straight regular columns.

There is yet another substance included in the structure of the human teeth, called the "crusta petrosa," or "cementum," and which invests the fang only: from its being more vascular than dentine it serves the admirable purpose of preserving a close union between the tooth and the bony substance in which it is imbedded. As regards the structure of the "crusta petrosa" it is very similar to that of dentine, having an infinite number of minute cells and tubuli intersected in its thickest layers by vascular canals. This substance can be detected by the naked eye on the teeth of all the herbivorous mammalia: but it needs the aid of a microscope to discern it on the human teeth.

In concluding our remarks on this

part of the subject, it is perhaps hardly necessary to state to the professional readers of this Journal, that the teeth are vascular and capable of circulating red blood. The author of this paper lately saw, in the city of Baltimore, several teeth taken from the mouth of a man just drowned, and which were so palpably charged with blood that they looked like pieces of red coral. It is probable that the red blood had been violently injected into the bony canals at the moment, and during the exertion of asphyxia. Dr. Maynard, of Washington, U.S., has several specimens in his possession; and Mr. Tomes, dentist to the Middlesex Hospital School, England, has in his late work given a beautiful drawing of a section of a tooth in this condition: it was extracted from the mouth of a gentleman who had just before undergone very violent bodily exercise.

I shall now proceed to notice shortly the nature and cause of that most destructive disease to which the teeth are subject,—Dental Caries.

I say *dental caries* because there appears to be little analogy between caries of the teeth and that of the other bones. Decay of the teeth consists in a breaking down of their molecules, a decomposition of the earthy salts of which they are composed, unaccompanied by pain (the pain in a diseased tooth being caused by the exposure of the nerve.) The decay assumes almost every variety of appearance, from white or cream color to that of a dark brown or very black aspect. This disease is unaccompanied by those phenomena usually observed in inflammation of the other bones, such as suppuration, a discharge of fetid sanies, growth of fungus flesh, &c.

Indeed, it is now almost universally conceded that inflammation is *not* the

cause of dental decay. Were it so, its attacks would not be confined, as they are, to the crowns of the teeth, but be as liable to affect the roots, the enamel, or the pulp cavity. The truth is, the osseous part of a tooth is *too feebly* and imperfectly vitalised to admit of its being subject to inflammation.

It is true that the *lining membrane* of a tooth may be, nay often is, attacked by inflammation; but the pain and condition of a tooth in this state is in all respects widely different from one affected with the disease in question.

As another, and we think quite conclusive, evidence that inflammation is not the cause of dental decay, we may mention the fact that teeth of other animals, or those of bone or ivory inserted as artificial substitutes, are, in certain cases, as liable to decay as the living human teeth, and the decay exhibits about the same appearance in the one as in the other. This of course could not take place, were caries dependant upon inflammation.

It is now universally acknowledged by the educated members of the profession, that dental caries is a chemical erosion of the teeth, by the action of an acid, either contained in the fluids of the mouth or the result of decomposed particles of our food, which may find lodgment in the interstices of the teeth. This acid entering into combination with the earthy salts of which the organs are mainly composed, breaks them down by little and little, until finally the nerve is laid bare to the action of the atmosphere and external irritants, and the well-known pain of toothache is the result, an affection more familiar to the *mouths* of most persons than even "household words."

It might indeed be supposed that as there are but four acids which possess a stronger affinity for lime than the

phosphoric, viz.: the oxalic, the succinic, the tartaric, and the sulphuric; therefore all the other acids would have no injurious effect on these organs: but every observing dentist knows the contrary. However, we are not left in any doubt upon this subject; for by the interesting experiments of Prof. Westmacott, performed before the class of the Baltimore college of Dental Surgery, we have a detailed account of the actions of nearly all the acids, vegetable and mineral, on the human teeth.

The following was the result of the experiments:—Acetic acid, or common vinegar, and likewise citric acid, entirely corroded the enamel in two days; malic acid (or that produced from apples) acted nearly as readily; muriatic, sulphuric, and nitric acids, although much diluted, made a very marked impression in about the same time; super tartrate of potash proved very injurious; while ordinary table raisins so affected the enamel in 24 hours that it could be detached with the finger-nail.

Now when we remember that all the above-named ingredients either enter into the composition of our daily food, or are exhibited as very general medicinal agents, we cannot wonder at the prevalence—I had almost said universality—of dental caries.

Prof. C. A. Harris, of Baltimore, (and a more eminent authority cannot be cited) is of the opinion that caries is more generally caused by an acidulated condition of the salivary and mucous fluids of the mouth, than by the extrinsic exhibition of acids, or by that generated from putrescent particles of food.

This gentleman instituted a series of experiments from which it appeared that the mucous secretions of the mouth were, in the generality of cases, charged with nitrous (septic) acid, while those of the parotid, submaxillary, and

sublingual glands were as universally neutral; however, in cases of marked gastric irritation, especially if of long standing, the salivary secretions likewise were invariably found to be in an acidulated condition.

According to MM. Tieddemann, Gmelin, and Donné, the latter of whom has investigated this subject with his characteristic carefulness, it appears that the saliva is always alkaline when the stomach performs its functions properly, and this being its normal quality, he considers all deviations from it as indicative of gastric disease.

Desirous of arriving at some accurate conclusion on the subject, I have been in the habit of testing the saliva of my patients for some time back, and I have found that the salivary secretions gave evidence of being slightly charged with an acid; but I confess I could not accurately determine the condition of the mucous secretions.

In two or three cases which have come under my notice, where the dentine was *slightly or not at all affected*, I have observed the *same phenomena*; so that I confess the result of my own experiments has not been as satisfactory in corroboration of the above theory as might have been expected.

Moreover, if dental caries is caused by an acidulated condition of the secretions of the mouth, how comes it that the lower incisors, which are constantly bathed in the secretions of the submaxillary and sublingual glands, are comparatively exempt from the disease in question? Unless these teeth are of a denser texture than the others, (of which there is no evidence) and so more capable of resisting the action of any chemical agent, it must be admitted that this fact stands much in the way of the intelligent establishment of the above theory.

With all due deference to the opinion of Prof. Harris and others who take his view of the question, I am inclined to think that dental caries is more frequently caused by the action of an acid generated by the acetous fermentation of portions of food which may lodge about the teeth. The lower incisors being more closely arranged than the other teeth, do not afford the same opportunity for this lodgment, and hence I believe their comparative exemption from the disease; and this explanation is the more satisfactory to my own mind, as daily observation convinces me that *caries of the teeth is a disease incompatible with perfect cleanliness of the organs*. Were this duty religiously observed, I fully believe "our occupation would be gone." In this respect at least every man could be his own dentist.

However, we are only on the threshold of scientific enquiry; but a spirit of investigation and ardent desire for knowledge have been stirred up among the educated members of the profession which will not rest, we trust, until the phenomena and cure of dental disease are as palpable and easy of demonstration as many other facts in medical science.

Let each one lend his energies and consecrate his talents to an end so desirable. Let him enter the field of laborious pains-taking investigation, in the spirit of one who is determined to surmount all obstacles, whose patience will hold out, and whose ardor will not flag, until he has reached the "ultima thule" of scientific research. Let him go forth under the shadow of that "banner with a strange device Excelsior," and we doubt not he will one day reach the summit of professional excellence and professional truth.

His reward will be, not so much hav-

ing his name inscribed in the temple of Fame, for that is perishable; but rather the consciousness of having lessened the overwhelming burden of human suffering, and of having discovered the cause and cure of one of the many "ills that flesh is heir to."

Quebec, Sept. 2, 1850.

ART. XXXIII.—*Fracture of the Thyroid Cartilage, through the Pomum Adami*. By GEORGE D. GIBB, M.D. *Licenciate Royal College of Surgeons in Ireland, Physician to the Montreal Dispensary, Member Parisian Medical Society, &c.*

The following case I send for insertion in the *British American Journal*, from the fact of its being of very rare occurrence—no author, that I am aware of, having either met with or described a similar accident.

On the 1st September, 1845, a healthy looking man, aged about 30, called upon me at the Montreal General Hospital, when Interne of that Institution, for advice about his throat.

He stated that two or three days previously, when getting out of a carriage, he fell, and struck one of the steps near the wheel with the "bone of the neck," and ever since his voice has been imperfect, with, at the same time, a strange feeling about the throat.

On examination, I found a longitudinal fracture through the pomum adami of the thyroid cartilage, the two ends of which could be moved upwards and downwards, and in a direction from before, backwards, producing a cartilaginous or soft crepitus, if I may so describe it. The deformity produced during this manipulation was trifling, and when the parts were untouched the fractured ends were in the proper position. There was no swelling observable, and deglutition was not interfered with, although he had this peculiar indescribable sensation in the throat.

There was not even any tenderness on a rough examination, and no appearance whatever of supervening inflammation. When speaking, the voice was slightly rough and hoarse, and now and then whi-spering.

In the treatment, I recommended the neck to be kept quite loose and free from the use of a tight cravat or kerchief; a fluid diet; to abstain from conversation; and to maintain perfect rest and quiet.

I never saw the patient but on this occasion, so cannot therefore say how the case may have terminated, but presume that the fracture must have united, without any difficulty.

48, Craig Street.

ART. XXXIV.—*Report on the Past and Present Condition of the Insane in Canada East.* By DOCTOR FREMONT, one of the Managers of the Quebec Lunatic Asylum.

[Read at a Meeting of the Association of Medical Superintendents of American Institutions for the Insane, June, 1850.]

Until comparatively lately in Canada East no attempts were made to treat insanity as a disease, in many cases susceptible of alleviation and cure. From the settlement of Canada until 1845, this unfortunate class of the human family were kept confined, either in close apartments in private dwellings, in the gaols of the different districts, or in cells made in buildings attached to and under the care of some one of the religious communities devoted to the relief of the sick and infirm in the districts of Montreal, Three Rivers, and Quebec.

Before entering more particularly into the description of the condition of the insane in this part of the British Provinces, I would wish to be distinctly understood, that no remark or opinion

expressed in this report is intended or meant to censure any community or individuals connected with the care of the insane, but merely the *systems* pursued and not the execution thereof.

The cells above alluded to were nearly similarly constructed in each of the three districts. They were made in some buildings one story high, surrounded with a high fence; they were from eight to nine feet square, and the same in height. Each had a small glazed and grated window in the outside wall, of about a foot square, and in the passage dividing the two rows of cells, there were small openings, also grated. Through these windows light was admitted, and, when opened, air. In winter stoves were placed in the passage to diffuse heat; in summer some very imperfect ventilation was procured by opening a window at either end of the passage. To each cell was affixed a wooden trough in the side, leading to a covered canal outside, which, if the patient would use it, conveyed his evacuations to a main sewer.

Little or no medical treatment was given to the cases thus in confinement, although a medical man was nominally attached to each establishment, who gave his services gratuitously when called upon.

The patients were ministered to by a man keeper for the males, and a woman keeper for the females. To keep them clean, the patients were, one by one, removed to a spare cell, while their own gloomy and miserable abode underwent the necessary process of washing and ventilation.

The patients in question were all at the charge of Government, and cost the Province at the average rate of \$2.50 per week for each.

It is evident that neither the cells, nor the attendance on the unfortunate

people confined therein, could allow of the enjoyment of external air or exercise, nor of moral or even medical treatment upon any system affording a reasonable hope of mental cure. They were simply places of confinement, without the possibility of beneficial effect upon the unhappy persons afflicted with the dreadful malady of insanity, further than placing them out of the reach of danger to others, and diminishing that to themselves which would have resulted from their personal freedom. Indeed, they were more likely to produce or increase insanity than to cure it. The remark of one of the patients, removed from the cells, was original, and pretty correct: he incidentally observed, "that if the Judge and the seven individuals who condemned him to be so confined had themselves been retained there, as he had been, for nearly eighteen years, he thought they would then be fully as mad as he was." This case, a complete wreck in mind, is an example of a large majority of the cases which had been confined in those cells.

This state of matters relative to the insane, seems to have been a mere extension of the accommodation which was found to exist at the conquest. At that time, four cells destined to the safe keeping of the insane, were attached to the Grey Nunnery at Montreal; four to the General Hospital at Quebec, and two to the General Hospital at Three Rivers,—all communities of ladies, originally founded for the relief and care of the sick and infirm.

As early as 1824, many efforts were made by the late Honorable John Richardson, one of the members of the Legislative Council, for the establishment of a Lunatic Asylum upon the improved principles which were the guides of such institutions in Europe and Ameri-

ca. It is from a report made by a committee of the Council, of which this truly excellent man and philanthropist was chairman, that some of the foregoing information was obtained.

To show how little insanity, as a disease, was understood, it is stated in the evidence attached to the report "that the patients undergo medical treatment for their cure, agreeably to Pinel of Paris, and Haslam of London; instructions for which treatment are in the hands of the nuns!!!" It is obvious that the modern improved plan of treating the insane under those circumstances, was quite impracticable—medical treatment perfectly useless, and any attempt at moral treatment, not only absurd, but in truth, bordering on the ridiculous.

It was not till the year 1843, shortly after Sir Charles Metcalf, assumed the Government of the Province, that any successful attempt at a change in the deplorable condition of the insane in Canada was made.

Moved by his benevolent disposition, he directed minute investigation to be made in the matter, and from the information received, he deemed it imperative not to delay any longer some amelioration in the painful and distressing condition of this interesting class of afflicted humanity. Accordingly a temporary arrangement was made with some medical men in the city of Quebec, for the maintenance, care and treatment of such insane as were then at the charge of the Government, in the districts of Quebec and Three Rivers. Shortly afterwards a similar arrangement having failed in Montreal, the insane from that district also were transferred to Quebec.

A property was leased at Beauport, in the neighborhood of the city, comprising a manor house, an extensive

block of out-buildings of stone, and about two hundred acres of land.

In September, 1815, the arrangements were completed for the reception of one hundred patients. Soon after, the patients from the cells at Quebec were removed to this new temporary asylum. They were removed in open carriages and in cabs. Many of these unfortunate people had been from one year and under to twenty-eight years in close confinement; and as a natural physiological consequence, most of them presented body and mind equally broken down and diseased; nevertheless, they appeared delighted with the ride, and the view of the city and river, trees, and passers by, appeared to excite in them the most pleasurable sensations. One, a man of education and talent, whose mind was in fragments, but whose recollections of a confinement of twenty-eight years was most vivid, wandered from window to window. He saw Quebec and knew it to be a city; he knew ships and boats on the river and bay, but could not comprehend steamers. They were placed together at table to breakfast, and it was most interesting to witness the propriety of their conduct, to watch their actions, to listen to their conversation with each other, and to remark the amazement with which they regarded every thing around them.

A few weeks after, the insane patients from the other districts were also removed to the temporary asylum at Beauport. Attempts had been previously made in Montreal to ameliorate their condition by removing them from the cells to the Gaol, and the effects of even this change were apparent in their improved state and condition. They were less violent, and their minds less weakened by close confinement.

The whole number in the asylum in October, 1815, was eighty-two.

The history of *no one case* accompanied the transfer of these unfortunate beings, but there was reason to believe that few, if any, were cases of recent date. Certainly, at least three-fourths had been in confinement for many years, and under circumstances that precluded the reasonable hope of any benefit being derived from any moral or medical treatment whatever. Very many arrived, chained and excoriated, furious and excited by restraints, and impaired in health by long continued seclusion. Indeed the question with many was not whether they would recover their reason, but how long they would live. Of this number, five only have been discharged either cured or relieved. Since then, a number of recent cases have been admitted, and as will appear by the returns, a proportionate number of cures have been effected.

In Lower Canada, before being removed into an asylum or deprived of his liberty, an individual, if of age, must be interdicted and declared incapable of managing his own affairs. This done before a judge by the advice of seven persons, who are, or are supposed by law to be, relatives or friends, and as such, this assemblage is styled an *assemblée des parents*.

The establishment to which these patients were then removed, although vastly superior to those whence they came in means to allow the reasonable expectation of improvement to many, was far from possessing all the requirements necessary to the most advantageous treatment, of such diversified cases as they presented. Nevertheless much was done towards the comfort and alleviation of their truly deplorable condition.

As soon as their muscular powers were sufficiently restored, the patients were induced to employ themselves in occupations most congenial to their for-

ner habits and tastes; some worked in the garden, others preferred sawing and splitting wood. The female patients were taken out daily and many of them engaged in weeding in the garden.—The effects of this system were soon apparent [in their improved health and spirits; they became stronger and ate and slept better.

Considerable difficulty was experienced in finding suitable means of employment for our patients during our long Canadian winters. Whenever the weather would permit, those who could be induced to do so, were employed at various out-door work, and in shovelling snow and removing it on small sleighs to a little distance from the premises. In the evening, most of the patients both male and female, amused themselves in dancing, of which they seem to be passionately fond. Music and dancing, as a source of amusement and recreation, were found to be admirably adapted to the insane; it seemed to divert their minds from their disordered fancies, without unduly exciting them; and it induced many of them to take exercise, who could be induced to do so in no other way. Even as remedial agents, they were found of benefit. In one case, they roused a patient from a state of the most abject melancholy, and gave a stimulus to his mental faculties, which resulted in perfect recovery. In another case, they effected a change from a state of melancholy with strong suicidal propensities, to a state of cheerfulness and enjoyment, which still continues, and may yet result in a cure. Drafts, Backgammon, books, and the daily papers, were also the in-door means of amusement and recreation at their disposal. The approach of spring, however, was always hailed by them with great delight, as the time when they could again employ themselves in the garden and grounds.

The total number of patients who were admitted into the asylum during the first three years of its establishment was 234, viz:

Males.....122
Females.....112—234

Of these there have been discharged during that time:

Recovered males.....16
“ Females.....14—30
Improved males.....7
“ Females.....5—12
Not improved: males.....6
“ Females.....6—12
Died: males.....24
Females.....26—50
—————101

And there remained: males, 70
Females, 60—130
—————

234

Of the cases admitted into the asylum during the same period of time, forty-three were brought in within one year from the first attack of disease, and of this number there have been discharged, cured, 21; improved, 2; not improved, 2; and 1, died; leaving 17 cases, of which five have subsequently recovered. The twelve remaining are improved, and with two or three exceptions are likely to recover.

The building then occupied as an asylum, though the best that could be obtained at that time, was not built for the purpose and was manifestly inadequate. It did not afford the means of carrying out the wishes and intentions of the managers as to the complete separation and classification of the patients, and from their increasing number, it became necessary to remove several to another building in the vicinity. These circumstances, under an arrangement with Government, for a further period of seven years, led to the erection of an Hospital of such extent, and with such arrangements, as to combine every thing necessary to the cure of persons afflicted with mental diseases. The necessary contracts were entered into in

December, 1848, for the erection of the Hospital, a view of which is hereto annexed, and the building was finished and occupied under the name of Quebec Lunatic Asylum in March last.

The grounds purchased for the use of the establishment, comprise 70 acres, varied in surface, well wooded, and watered, and commanding a perfect view of the city, harbor and surrounding country. The Asylum itself is a mile and a quarter from Quebec, is situated on the north side of the Beauport turnpike road and is surrounded on the three sides by the river *des Taupieres*.

The building is of gray limestone hammer-dressed in courses, and is covered with slate. It is two stories high, surmounted by a dome, and possesses a basement story and attics. Its *facade* towards the road is 217 feet in length, with two wings at right angles to the front, each 132 feet long.

The entire building is heated by four hot air chambers and flues, all of which are placed under ground.

The establishment is abundantly supplied with pure soft water, which is conducted from the river *des Taupieres* into the building by pipes, and conveyed into cisterns in the attics by a powerful force pump. This pump is also fitted with hose to serve the purpose of a fire engine.

The building is thoroughly lighted by gas, which is manufactured from coal, in a separate building erected for the purpose in the rear. This building, similar in construction to the main building, contains also a wash house, and other offices.

The establishment is fitted up with ten cast iron water closets on an improved principle. The contents are conveyed by iron pipes to large cess-pools placed outside the building.

Sixty feet of the main front is used in

the basement for kitchen purposes. On the first floor by the hall, the reception room, physician's office, and servants, dining room.

The second story is occupied principally, by the warden and his family, and the attics are used as bed rooms by the house and farm servants. The remainder of the front and the entire wings are devoted exclusively to the use of the patients. The male patients occupy the east and the female patients the west front and corresponding wing.

The patients on each side are subdivided into four classes. The idiotic, and those patients who are intractable or filthy in their habits, occupy the north end of the wings; two day rooms, two water closets, and bath rooms, and twelve sleeping rooms are devoted to this class of the inmates in each wing. A corridor on the first flat, 130 by 120, and four dormitories are occupied on each side by a class whose habits are more orderly. Corresponding day rooms and dormitories in the upper flats are devoted to a still more orderly class of patients. The front, on each side of the centre building is used by convalescent patients. Two large day rooms and six dormitories are devoted to this class of patients.

The establishment, as now completed, is capable of affording ample accommodation for 200 patients and their necessary attendants. The attic story, except sixty feet of the main front, is not fitted up, nor used, but is susceptible of division into dormitories and small bed rooms to accommodate at least one hundred additional patients. As to the numbers at present in the Asylum, I beg leave to annex a copy of the last monthly return—from 1st to 31st May :

Men—Remained, 77; since admitted, 6; discharged, 2; dead, 0; remaining, 81.
 Women—Remained, 84; since admitted, 1; discharged, 3; dead 0; remaining, 82.
 Total—Remained, 161; since admitted, 7; discharged 5; dead, 0; remaining, 163.

Remarks.—Of the seven admitted

during the month, four are likely to recover; one is doubtful, and two are likely to be incurable cases.

Of the five discharged during the month, four were quite well and one much improved.

(Signed,)

J. DOUGLAS.

Quebec, June 2d, 1850.

ART. XXXV.—*Third Annual Report of the Regents of the University of the condition of the State Cabinet of Natural History, and the Historical and Antiquarian Collection annexed thereto.* Albany: Weed, Parsons & Co. 1850. 8vo. pp. 175.

The Cabinet of Natural History at Albany appears to be in a highly prosperous condition. Eleven papers are comprised in the report; two of which are zoological catalogues, a third of the minerals, rocks and fossils; and a fourth of the historical and antiquarian collection: the specimens in all having been presented during the year 1849. Several valuable papers on mineralogical, geological, and antiquarian subjects conclude the report. A number of beautiful highly finished and coloured representations of Indian work are contained in the volume. We heartily wish the managers of the Cabinet prosperity, and that they could infuse into institutions of a similar nature with us some of that zeal which is so markedly evidenced in the report before us.

ART. XXXVI.—*Remarks on the Comparative Value of the different Anæsthetic Agents,* by GEORGE HAYWARD, M. D., Boston. Pamphlet, pp. 11.

This little brochure is a professed enquiry into the comparative value of Sulphuric Ether, Chloroform, and Chloric Ether as Anæsthetic Agents. It is valuable as containing a statement of the author's experience on the subject, an experience by no means small. Dr. Hayward considers Sulphuric Ether as

the most valuable of the three, giving rise by its employment to no unpleasant symptoms. Chloroform he condemns on several grounds, but chiefly in consequence of the fatal results which have occasionally attended its exhibition. So far as our own observation extends, we do not coincide in Dr. Hayward's opinion; and we are satisfied that general surgical experience would decide in favour of Chloroform, if not in America, at least in Great Britain, France, and Germany. The few fatal cases which have occurred—(few considering the extent to which the practice of anæsthesia by Chloroform is carried)—do not, with us at least, afford any sufficient reason against its exhibition. This subject is still in its infancy, and a wide field is open to investigation in regard to the nature of the anæsthetic to be employed in particular cases, the quantity to be exhibited in reference to its toxical agency, &c. Dr. Hayward's pamphlet, by directing attention to this matter, will contribute much to this desirable result.

ART. XXXVII.—*An Historical Sketch of the State of Medicine in the American Colonies, from their first settlement to the period of the Revolution,* by JOHN B. BECK, M.D. Prof. of Mat. Med. and Medical Jurisprudence in the College of Physicians & Surgeons of the City of New York, &c. &c. &c. Second edition. Albany, 1850. Pamphlet, pp. 63.

This is a most interesting account of the early condition of Medicine on the continent of America among the Anglo-Saxons. The mere fact of a second edition being called for proclaims the estimation formed of the work by the American Medical Profession. We have read it with pleasure and profit, and regret that our space, so limited, prohibits our making copious extracts.

ART. XXXVIII.—*A Theoretical and Practical Treatise on Midwifery, including the Diseases of Pregnancy and Parturition; by P. CAZEAU, Adjunct Professor in the Faculty of Medicine of Paris, &c. &c.: adopted by the Royal Council of Public Instruction. Translated from the 2nd French edition, by ROBT. P. THOMAS, M.D. Philadelphia: Lindsay & Blakiston. 1850. 8vo. pp. 765.*

The literature of our Profession is at the present day so well stocked with works of distinguished merit on Midwifery, that additional ones in our own language would seem almost a superfluity. The present volume comes highly recommended, and the translator has exhibited good judgment in ushering it before the Profession.

The work is divided into four parts. The first is devoted to the anatomy of the organs concerned in reproduction. The second takes up the subject of Generation, comprising conception, gestation, the development of the ovum, as regards the mother: and with regard to the fetus, its dimensions and weight, position and attitude, and functions. The conclusion of this part is devoted to the various diseases of the pregnant state. These important subjects occupy nearly one-third of the whole treatise. The third part is confined to the consideration of Labor in general,—natural labour in particular, with the various presentations and positions. The fourth part treats of the various kinds of dystochial labours, and the several kinds of obstetrical operations; and the last part is devoted to the placenta, to hæmorrhage occurring before, during and after its extraction, to inversion of the uterus and rupture of it.

Having carefully examined the work, we cordially recommend it to the notice of students, and the members of the profession. The various points of practice are judiciously given, and may be

safely followed. The fact of its having been adopted by the Royal Council of Public Instruction in Paris indicates at once its value; and when we furthermore observe that the work is fully enriched by the labours of antecedent writers, it will be found to the enquiring student, and the medical practitioner, a collection of rich material.

We observe an omission on the part of the American translator. He might have enhanced the value of the work still further by remarks on the employment of anæsthetics; as this subject is not alluded to in the original, Dr. Thomas probably did not consider himself warranted in doing so. His own notes, which are not extensive, are in the main judicious.

PRACTICE OF MEDICINE & PATHOLOGY.

On the Communicability of Asiatic Cholera, by ALEX. H. STEVENS, M.D.

—Two theories, and two only have been conceived to account for the existence of the Asiatic cholera. It is the design of the following paper to examine each of these in detail, and to endeavour to decide to which of them truth belongs.

According to the first theory, the disease is caused by a peculiar state of the atmosphere extending over vast regions, imperceptible to the senses, and giving no evidence of its existence by statical, chemical or medical tests, or indeed in any other way than in the causation of the cholera. The starting point of the doctrine is therefore a double hypothesis. It assumes without proof: 1st, That this peculiar state of the atmosphere exists. 2d, That it is the cause of cholera. These propositions have no other support than that which they derive from each other. Cholera exists, therefore there is a peculiar state of the atmosphere. There is a peculiar state of the atmosphere, therefore cholera exists. This is palpably only reasoning in a circle.

It is contended that the hypothesis derives support from analogy, that influenza is owing to an unknown condition of the atmosphere, and that the

spread of these diseases is very similar one to another. What is the precise evidence that influenza is owing to an unknown or meteoric state of the atmosphere? There is no evidence of any peculiar condition of the atmosphere, except the existence of the disease of which it is supposed to be the cause, unless it be that it is not easy otherwise to account for it. But is it not presumptuous in the present state of our knowledge—sufficiently advanced only to make evident the extent of our ignorance—to consider as proved that we know all the modes in which these diseases may be caused, and knowing no other, therefore it can only be in the atmosphere? This cannot for a moment be believed. The generation of plants or animals without a germ can be supported by stronger arguments.

Every hypothesis should account satisfactorily for the phenomena which it professes to explain. The one under consideration fails of doing this. The key does not unlock the door; although, if it did, it would not follow that it belonged to it.

A vessel coming from Havre becomes the scene of cholera several weeks after her leaving that port, and on her approach to the banks of Newfoundland. Here she first encountered, say the advocates of this hypothesis, the meteoric condition of the atmosphere which is the cause of cholera. In her progress to New York new cases occur. She lands her passengers; new cases occur among them, and among those who have intercourse with them, and among them only.

Let us apply this hypothesis to the explanation of these facts. Was the atmosphere between Newfoundland and New York, and at New York, infected or not by the ship and her passengers; or independently of them? Other vessels were constantly navigating the same waters, and no cases of cholera occurred amongst them.

There is no evidence of any general or wide-spread infection of the atmosphere. But the vessel encountered a particular "streak" of infection off the banks of Newfoundland, kept in it during her approach and after her arrival at New York. Now the doctrine of meteoration has ever looked to widely-diffused influences, and regarded diseases prevalent in limited localities as

arising from local and not general epidemic causes. I will not further dwell upon this assumption, for it is too improbable to require a more extended notice.

The hypothesis of disease being caused by a meteoraceous state of the atmosphere does not at all advance our knowledge of the remote causes of disease. It is improperly called an explanation. It is only a confession of ignorance; and just as strong proof might be adduced that diseases were induced by witchcraft, or the influence of comets and fiery dragons in the heavens; of the latter, indeed, meteoration is but the expression; it should be discarded from science; it belongs to the dark ages.

But it may be argued that the ship became infected at Newfoundland, and brought the infection with her, and thus kindled up an infected atmosphere in New York. In what way? As one ill of the small-pox conveys the poison to another through the air infected by him. This involves personal communicability or contagion, as it is called, which the advocates of the hypothesis deny. Did she bring with her animalcules, or the seeds of fungous plants, which as in yeast propagate themselves? Of this there is no proof, and were there proof they would be only modes of contagion or personal communication. Enough, I trust, has been said to show that the hypothesis of meteoration is untenable.

There is another mode in which analogy might lead us to suppose the cholera is communicated, *i. e.*, from the persons, clothing, and habitations of the sick. The experience of a single week during the prevalence of cholera would, if collected, fill a volume with cases showing more or less conclusively the extension of cholera from the sick to the well. The facts are so numerous and so notorious that it is deemed unnecessary to cite any one in particular. The appeal is confidently made to all candid medical observers for the truth of the assertion, that the introduction into a healthy region of a person ill of cholera, is very generally followed by the occurrence of other cases among those who have had intercourse with him. But I go further, and maintain that the disease since its first origin in Asia has not originated *de novo*, but has been propagated successively from person to person.

The strongest proof that cholera may

originate *de novo* would be the discovery of the disease in regions that have had no communication with those wherein cholera has existed. No such proof can be adduced, but over the whole of the wide-spread regions occupied by the Pacific and great Southern oceans, greater in extent than all the continents, studded over with islands more or less occupied by inhabitants, the cholera has never been found except where it has been brought in ships.

It has never occurred in ships except among those from infected ports, or having on board passengers or goods from infected places. It first came to this continent in 1832 in infected ships. It came again in the same way in 1849. It was carried up the Mississippi and its tributaries in steam vessels, in the same way it was carried up the great Northern lakes of America. It has never taken a contrary course, or originated on board steam vessels or ships from mere filth or crowding together of human beings, where such vessels have not come from infected places. It has ever followed the course of commerce and of human intercourse, and it has never, so far as I have been able to ascertain, occurred in insulated or even in isolated localities, where it might not have been conveyed by infected persons or their clothing. The proof of such conveyance, it must be admitted, cannot always be obtained, but this is equally true of small-pox, measles, hooping-cough, scarlet fever, &c; diseases which are admitted to be propagated by contagion, or as I would rather express it, by personal communication, either directly or thro' the medium of infected clothing.

The doctrine of the communication of cholera from person to person is not like the former, a mere hypothesis, but is, on the contrary, an inference from facts. If we suppose that there is no power of personal communicability, the chance, or the probability that the first case of cholera would occur among the hundred or more who were brought within the influence of the sick who arrived here, rather than among the 400,000 inhabitants of New York, who had no such communication, is precisely in the proportion of these numbers to each other, and when we endeavour to calculate the probabilities or rather the improbabilities of the second, third, and fourth case occurring among the same 100, it is

difficult to express it in figures. It amounts to millions of millions. But it is objected to the contagious nature of the cholera: 1st. That communicable diseases are capable of attacking the system only once, whereas one attack of the cholera affords no exemption against a second. To this may be answered, that exemption from a second attack is not without exception the characteristic of any contagious disease; small-pox, measles, hooping-cough, and scarlet fever, do occasionally occur in the same individual a second time.

With other contagious diseases, such as puerperal fever, erysipelas, and perhaps typhus fever, a first attack affords no immunity against a second. But no contagious disease is like to any other in its character. Some may originate *de novo*, others do not; some may be conveyed by inoculation, others cannot be so transmitted. Analogy is in favor of difference and varieties, and were it otherwise it is a weak argument, as against inferences from facts. The only proper use of analogical reasoning, is to make it the basis of conjecture where facts are wanting to establish principles.

It is objected against the communicability of cholera from one person to another, that amongst hundreds who are brought within the sphere of contagion, if contagion really existed in the person of the sick, only one may contract the disease: this argument has been put forth triumphantly, as decisive against personal communicability.

This same argument would prove that the cause of the disease did not exist in the air. It would apply even with additional force. If the cause is meteoric, then among 500,000 persons in the city and suburbs of New York, a proportion vastly less is attacked while all are alike exposed. But here analogy is brought in to support the argument: Diseases communicable from person to person are in the majority of cases communicated. This is true, but only under favoring circumstances. Cholera requires favoring circumstances peculiar to it only, and does not lose its quality of contagiousness, because it is not imparted except the recipient be in a proper state to receive the infection. So does typhus fever, and in a greater or less degree all contagious diseases. Nature knows no Procrustean bed to which all diseases

must alike conform in their modes of transmission. True philosophy observes and records the laws of nature, but does not prescribe them.

It has been further urged against the contagious nature of the cholera, that intercourse with the sick, as in hospitals for example, has not appeared to increase the dangers of infection. On this point I apprehend that in a dense population where the disease is extensively prevalent, the poison is applied to all and not more truly to those in the vicinity of the sick than others. In walking a crowded street we may unconsciously come in contact or proximity with persons suffering from cholera, themselves perhaps unconscious of being under its influence. Moreover, the general immunity of those about the sick is not without many striking exceptions. In the Greenwich hospital during the epidemic in 1832, I am informed by Dr. Lee, fourteen nurses out of sixteen died of cholera.

It must be admitted that cases of cholera occur in which it is difficult and even impossible to detect the mode in which the contagion has been conveyed: but it must be borne in mind that it may be retained in clothing, and that it adheres tenaciously to dwellings for a great length of time; that it is conveyed by persons not affected themselves with the disease, and it seems highly probable that the premonitory diarrhœa is capable of imparting the disease. It is very generally believed that a peculiar condition of the atmosphere precedes cholera, in some instances causing influenza, and that this peculiar state of the atmosphere exists even in localities where no cases of cholera exist, giving rise to diarrhœa from slight causes, in such as under ordinary circumstances would be attended with no such consequences.

Its relation to the first point, viz.: the antecedence of influenza, it is by no means uniform or even general; not enough so, considering the frequent occurrence of epidemic influenza, to render it probable that there is any connexion between the two diseases, or that they arise from any modification of one and the same cause.

It should moreover be borne in mind, that the number of those who suffer from cholera in its premonitory stages only, but which yet constitute cases of

the disease, is vastly greater than those in which the malady runs its full course, and herein lies the true peculiarity of cholera—a characteristic which belongs to no other communicable disease. Other diseases go through all their stages; this only can be arrested. It is thus the most curable of all diseases.

In regard to the existence of diarrhœa, or a tendency to it, in almost all persons in localities where cholera prevails, it is admitted. For in such localities all are more or less under the influence of the poison. But that such a condition obtains in localities remote from those where cholera exists may well be questioned. During the present epidemic, and also in that of 1832, I saw many cases in various parts of the country remote from those where cholera prevailed, in which articles of food which in the city of New York were almost sure to induce cholera, were habitually taken by all classes with entire impunity. If there were any exceptions to this practice, they were amongst persons who lived in fear of the disease, who took medicines as preventive, and altered their habitual diet. In view of these circumstances, it does not appear that the meteoric hypothesis receives any support from the admitted tendency to diarrhœa in the localities where cholera prevails.

Before the introduction of the cholera in a vessel from Havre in December, 1848, there was no unusual tendency to diarrhœa observed near New York, nor was there any prior to its introduction from Canada in 1832. An argument against the contagiousness of cholera has been drawn from the fact that it attacks, in far greater ratio than others, those who are filthy and who reside in filthy places. Yet it must be borne in mind that some of the most filthy occupations have seemed to afford an exemption from cholera. A distinction should be made between those whose occupations are among filthy matters and those who are filthy from the want of ablution. But admitting the statement to be partially true, it admits of another solution than that which argues that the local impurities aggravate the choleric character of the atmosphere. They who live in their own filth are more likely than others to commit errors in diet; are most apt to be intemperate in the use of ardent spirits, and above all, they sleep

in crowded rooms and are thereby debilitated and incur increased risk of receiving the contagion, for crowds of all kinds are admitted to favor the extension of cholera. Moreover, the habits of the class of persons under consideration, are for the most part in low and damp situations. It may be that the cholera poison gravitates to the lowest places, and it is altogether probable that, like other foreign matters in the air, it attaches itself to moisture, and these facts seem to furnish sufficient reasons why such persons and such places furnish so disproportionate a number of victims.

I am quite aware that on the whole the weight of medical authority is against the contagiousness of cholera. In such matters truth is arrived at by slow degrees. Small-pox prevailed for several centuries before its contagious character was admitted. Sydenham classed it with epidemics such as peripneumony and influenza, and until within a little more than one hundred years, it was not supposed to be communicable from person to person. Dr. Mead wrote a treatise in proof of its contagiousness. Some may contend that although cholera be communicable from person to person it is better for the community that the truth should not be admitted or proclaimed. But besides the general principle that scientific truth should never be concealed, if such concealment were even possible, it will be obvious to any one who considers the subject, that the question has other bearings of vast importance as regards the practice of quarantine in ports, prisons, and other public establishments where large masses of human beings are congregated together. Is there no advantage to be derived from a knowledge of the fact that isolation affords entire security? That the painful and often injurious restrictions in diet are, under such circumstances, entirely unnecessary? How much needless exposure, often from mere curiosity, may be avoided by excluding from the presence of the sick those who manifest a tendency to diarrhoea, who use ardent spirits to excess, who are debilitated in body and timid in mind and by husbanding the strength and supporting the energies of devoted friends at the bedside. But further, the progress of scientific investigation is by successive

accumulation—the discovery of one truth becomes the basis of another.

The contagious character of cholera once admitted, we are in a position to inquire how soon the disease acquires a contagious character; how long after death the bodies of those who may die of cholera may communicate the disease; how long the contagion may be retained in clothing, buildings, ships, &c.; the action of heat and cold on these agents, in neutralizing the poison: the period of incubation; the liability of the same person to a second attack; and the most effectual measures of personal and public Hygiene. It cannot be doubted that a more perfect knowledge of these subjects than we now possess will disarm the pestilence of many of its terrors. Notwithstanding the fatal character of cholera without treatment, it is in its early stage the most curable of all diseases. It is indeed among the few—the very few—diseases which, strictly speaking, are curable at all; other diseases are managed, this is arrested.—*Transactions of the Medical Society of the State of New York.*

SURGERY.

Self-inflicted Wound of the Throat, laying open the Œsophagus—Recovery. (Under the care of Mr. Adams.) Wounds of the throat in persons who attempt to commit suicide, may be of a trifling kind, or cause death instantaneously, either by hæmorrhage or suffocation. There are between these two extremes a great variety of lesions resulting from self-inflicted wounds of the throat, placing the patient in a more or less dangerous situation; among these, the complete division of the thyroid and cricoid cartilages, with a subsequent wound of the œsophagus, are looked upon as extremely hazardous, and the management of such cases requires great care and nicety. It is, however, satisfactory to notice, that an enlightened and close attention to the treatment may triumph over the numerous difficulties which lie in the way of recovery when the wound is of the above mentioned destructive description; and it is our pleasing duty to record a case, lately under the care of Mr. Adams, where favourable results were obtained.

From the notes of Mr. Ball, the house-surgeon, who very courteously afforded us frequent opportunities of seeing the patient, we are enabled to give the following details. On the 28th of February, 1850, a man, about twenty-five years of age, of thin, spare make, and a salesman by trade, was admitted into the hospital with an oblique incision in the anterior part of the throat, extending from above the thyroid cartilage to the fourth ring of the trachea. Both the thyroid and cricoid cartilages, and the three first rings of the trachea, were divided; the knife had passed between the sterno-hyoid and sterno-thyroid muscles, and had slightly lacerated them at their inner edges; the isthmus of the thyroid body was laid bare, but not divided. This desperate wound was inflicted by the patient's own hand while under considerable excitement, with a common table-knife, about an hour previous to admission. The hæmorrhage had been considerable, but had ceased when the patient entered the hospital; the lungs, however contained a large quantity of blood, which had passed into the trachea, and this fluid, excited by its presence in the lungs, constant cough, with expectoration of the blood through the wound in the throat.

This fact again proves how seldom the suicide succeeds in wounding the common carotid or jugular vein, the hæmorrhage mostly proceeding from some of the primary branches of the external carotid. Here it would appear, that the violence used was expended upon the division of the hard bodies above mentioned, viz., the thyroid and cricoid cartilages, the rings of the trachea, and, as will be seen below, part of the œsophagus, these organs being probably rendered prominent by the head having been thrown backwards. The cut was likewise an oblique one, and was therefore less likely to reach to a greater distance posteriorly.

The patient, under these circumstances, was immediately put to bed, his head and shoulders were raised by means of pillows; a silver tube was passed into the trachea to facilitate the ejection of the blood; and lint, wet with cold water, applied to the wound. Mr. Adams saw the patient a few hours after admission, when the breathing was much easier, a large quantity of blood having been expectorated through the

tube. Mr. Adams approved of what had been done, and ordered thirty drops of tincture of opium to be given the patient without a vehicle, so as not to tax the powers of deglutition; but he swallowed this small quantity of fluid with great difficulty, and the attempt excited a violent fit of coughing. The patient, made towards the evening, several unsuccessful attempts to swallow small quantities of milk, but the greater portion of it passed into the trachea and caused violent cough; the milk, at the same time, escaping by the wound in the windpipe.

These phenomena confirmed Mr. Adams in the previous suspicion of a wound of the œsophagus; the canula was therefore removed from the wound in the trachea, and an attempt made to pass a flexible tube into the stomach; this was, however found impracticable, for the tube invariably passed through the wound in the trachea, instead of gliding down from the pharynx into the œsophagus, and excited an alarming amount of irritation. No doubt now remained regarding the wound having reached the œsophagus; and as no tube could be passed into the stomach, Mr. Adams had recourse to enemata for nourishing the patient. A pint of beef-tea was therefore injected; the man was allowed to moisten his mouth with a wet rag, and as he breathed quite freely through the wound, it was not thought advisable to replace the canula into it.

This method of administering food by the rectum is invaluable in such cases, and the patient owes his life to this measure; it is a pity that it is not invariably adopted in analogous circumstances. The case of a child, for instance, was lately mentioned at the Surgical Society of Paris, who had died of inanition. The little patient had had tracheotomy performed upon him to ward off impending suffocation from croup; as the food subsequently passed through the opening in the trachea, the œsophageal tube was thought of, but could not be used, owing to the inflamed state of the larynx; the child died. It is not too much to suppose that the child might perhaps have been saved by nourishing enemata.

The difficulty of deglutition in Mr. Adams' patient went on increasing on the second day; even the swallowing of his saliva gave him great pain; he was therefore ordered half a pint of beef-tea

to be injected into the rectum three times daily. In the night the patient spoke once or twice in a whisper; but strict silence was enjoined, as the effort of speaking excited fits of coughing, which left him greatly exhausted. The bowels having been relieved on the next day after admission, Mr. Adams ordered thirty drops tincture of opium to be administered in a starch enema of one ounce, towards evening, to procure rest. The patient was likewise removed into a private room, as the cold air excited cough. This change to a higher temperature proved very beneficial; the irritation about the air passages diminished considerably; there was much less cough; and a very evident improvement was noticed in the patient's countenance. He, however, was much tormented with thirst, to satisfy which, Mr. Adams ordered an enema composed of a pint of cold milk, and directed a small piece of ice to be placed in the patient's mouth. The wound, in the meantime, went on very favourably, and was dressed solely with lint dipped in cold water.

On the fifth day the patient was able to speak in a whisper without pain or exciting cough, and there was great improvement; he was nourished entirely by beef-tea and milk enemata, with the administration of thirty drops of tincture of opium by the same means every night, the bowels being kept regular.— On the eleventh day after admission, he began to take a small quantity of bread and milk by the mouth, which he succeeded in swallowing without any difficulty. The wound had in the meantime rapidly filled up, and was now about one-fourth of its original size. Beef tea, milk, rice-pudding, and porter, were soon taken by the mouth, and the patient improved rapidly up to the twenty-third day after the rash act, when symptoms of constitutional disturbance appeared, and pain was complained of both in the head, neck, and shoulders. A purge of calomel and rhubarb, and a blister to the temples, did not succeed in removing these symptoms; the tongue became tremulous and the pulse weak; the patient was therefore prescribed bark with half a grain of hydrochlorate of morphia at night; and by the assistance of wine, porter, &c., he regained his strength; the wound healed completely, and the patient was discharged in a very satisfactory condition forty-one days after

admission. He was still holding his head rather erect, however, and his voice was somewhat indistinct; but it is to be supposed that with the eventual perfect consolidation of parts within the trachea, and subsequent absorption of exuberant fibrinous deposits, the voice will regain its former tone. It will be noticed that no vessel required tying, and that no secondary hæmorrhage took place; and as certain, not unimportant, branches of the external carotid *must* have been divided, the fact of the cessation of the bleeding will be an additional illustration of the retracting power of arteries, when completely divided. Nor should it be passed unnoticed how well was exemplified in the foregoing case the propriety of avoiding plaster and sutures, as is generally advised by systematic writers when treating of wounds of the thorax.—*Lancet*.

Treatment of Aneurism by Compression.—Remarks by the Dublin Medical Press on Dr. Bergin's case, published in a previous No. of the British American Journal.—In justice to Dr. Bellingham, and to his method of treating Aneurism by compression, we extract the following from the *Dublin Medical Press* of the 2d Oct. The inaccuracies in the method of treatment by compression, pursued by Dr. Bergin in his case, struck our mind forcibly; but we waived all observations of our own, in expectation of a reply to Dr. B.'s communication from two medical gentlemen who volunteered it—one of whom has since left the city. We entirely coincide in the justice of the following remarks; and would moreover observe, that even had Dr. Bergin treated his case with the strictest attention to the rules laid down by Dr. Bellingham and with no success, the result would not, of itself, have militated against the general utility of the practice, which has been so extensively confirmed.—[Ed. B. A. J.]

To any one unacquainted with the method of treating aneurism by compression, as employed in the Dublin Hospitals.

the perusal of the foregoing case would give a very unfavourable impression of the efficacy of pressure in the cure of the disease. "Having read (Dr. Bergin says) in your journal Dr. Bellingham's paper on 'Aneurism and their Cure by Compression,' I determined to try its effects in this case, and in the event of its failure to resort to the ligature." Then, "after bandaging the limb (he observes) from the toes upwards, I applied two tourniquets over the femoral artery—one immediately above the tumour, and the other a short distance above the first so as to alternate the pressure, and also to follow as closely as possible the method described by Dr. Bellingham."

We shall premise by observing, that the mode of employing compression adopted by Dr. Bergin is not that recommended in Dr. Bellingham's work, and that if such a mode as Dr. Bergin used had been attempted to be carried out in Dublin, it would necessarily have failed; and not only failed, but it would probably have proved even more fatal than the records of surgery prove the ligature of the femoral artery for popliteal aneurism to have been.

The aneurism, in the case given by Dr. Bergin, is described as being of a very large size: "it occupied the whole of the lower third and a greater portion of the middle third of the thigh;" its pulsation was very violent, "so as almost to throw the stethoscope off the tumour;" while pressure with the finger upon the artery above "merely moderated the circulation in the tumour, but was not sufficient to arrest it completely."

In such a state of the circulation, and with such a form of disease to deal with, Dr. Bergin, without using any preliminary measures, at once commenced "by bandaging the limb from the toes upwards;" the necessary effect of which would be to retard or impede the return of the blood by the superficial veins, according to the tightness with which it was applied. He then "applied *tourniquets*, so as to alternate the pressure." "On the application of the tourniquet, the circulation through the tumour immediately ceased." Thus the passage of the blood down the main artery of the limb was cut off, as well as the current through the collateral vessels, and the blood was entirely prevented from returning by the veins.—This could not of course be continued for any time without occasioning great suffering, which became so intense "as to oblige the patient, although a man of great courage and patience, to change the pressure from

one instrument to the other every eight or ten minutes."

As might have been anticipated from such a beginning, we have next a melancholy detail of sleepless nights and intense sufferings, which morphia failed to relieve; and when the patient could bear it no longer, the pressure was discontinued, "the tumour having increased in size," and "the leg and thigh having become cold and œdematous."

We have more than once taken occasion to protest against the misapplication of the term *compression*, when applied to proceedings in which all the rules which should guide us in the application of pressure are violated.—We do so again, because we believe the principles upon which this method is based are still imperfectly understood outside the city of Dublin; indeed Dr. Bergin's case is a strong example in point, and instead of being surprised at the failure of compression in his hands, we are only surprised that the patient had the resolution and fortitude to bear it as long as is stated. We even think it not unlikely that the doctor may have been deceived in this respect, and that the patient, in his absence, loosened the tourniquet, and thus escaped loss of limb, or of life, from rupture of the sac, or from gangrene of the extremity.

As the case given by Dr. Bergin is likely to be copied into other journals, we have thought it right, in quoting it here, to accompany it by these remarks; more particularly, because of the disingenuous way in which similar cases have been seized upon, and held up as beacons to warn surgeons against attempting the cure of aneurism by compression; which it is charitable to suppose, has sometimes been done through ignorance of the manner in which compression effects the cure of aneurism, and of the mode in which pressure ought to be applied in order to ensure this result. Besides, as Dr. Bergin promises, "in a future number" of the journal, "some remarks upon the relative value of compression and the ligature," our impressions, on the perusal of his case, may possibly prove of assistance to him.

ANATOMY.

A new variety of Vascular Anastomoses between the Vena Porta and Vena Cava Inferior.—M. Claude Bernard read a paper before the Academy of Sciences, upon a new variety of vascular anastomosis.

The author described a special mode of anastomotic communication existing

between the vena portæ and the inferior vena cava, immediately on the entrance of these two great vascular trunks into the liver.

In the liver of a horse, where M. Bernard had studied this disposition, the trunk of the vena portæ and that of the vena cava, just on their penetration of the liver, are separated only by a space of three or four centimetres. The hepatic substance which fills up this space, and which represents the lobus spigelii, is often pressed against and atrophied from the fact of the occasional enormous dilatation of the trunk of the inferior vena cava.

It is in this space of separation existing between the trunk of the vena cava and that of the vena portæ in which are found the anastomosing vessels, which M. Bernard proposes to describe, and which are for the purpose of causing a direct communication between the abdominal venous system of the vena portæ with the general venous system. These vessels proceed from the trunk of the vena portæ to pass close to the vena cava in forming an anatomical disposition entirely special. As soon as the trunk of the vena cava has penetrated through the liver, and often also a little before it, it gives off a certain number of branches, which, some being situated superficially, others deeply, subdivide on penetrating through the thickness of the substance of the liver and on carrying themselves to the right side of the vena cava inferior. These vascular branches furnish others which are lost in traversing the hepatic substance, but a large number pass directly through the external surface of the vena cava inferior, where they distribute themselves in a singular and unusual manner. In fact, these ramifications expand upon the external surface of the vena cava inferior, presenting in the first place the appearance of a magnificent network of *vasa vasorum*, but, on examining them more closely, we observe that a great many of these branches, in place of dividing themselves into capillaries, sink in abruptly to communicate with the cavity of the vena cava inferior. These vascular branches open themselves separately, where (and this disposition is very frequent) numerous branches reunite themselves previously, in a manner to form a pouch or common reservoir

which communicates directly with the vena cava inferior.

These anastomosing vessels do not possess any valves in any part of their course. Their walls were slightly resisting, and present the same structure as the other ramifications of the vena portæ, whilst the branches of the sub-hepatic veins, on the contrary, partake in a very evident manner of the muscular structure which characterises the hepatic portion of the vena cava inferior. This difference will prevent, in all cases, the confounding the two orders of vessels on their opening into the vena cava. Besides the mouths of the opening, of the branches of the vena portæ, are distinguished from those of the small sub-hepatic veins, by their great regularity and the longitudinal direction of their muscular fibres similar to the vena cava inferior.

This system of direct communication of the hepatic vena portæ with the vena cava inferior, which does not exist only at its entrance into the liver, but which may be equally seen in the depths of that organ and throughout the large trunks of the sub-hepatic veins, and especially in the vicinity of their insertion into the trunk of the vena cava inferior, establishes in a very extensive manner, a true collateral hepatic circulation.—*Gazette Medicale*.

Researches to prove the non-Vascularity of certain Animal Tissues. By JOSEPH TOYNBEE, F.R.S.—In the introduction to this paper the author first speaks of the process of nutrition in those animal tissues which are pervaded by the ramifications of blood vessels, pointing out the circumstance that even in them there is a considerable extent of tissue which is nourished without being in contact with vessels. The knowledge of this fact leads to the study of the mode of nutrition in those tissues which contain no blood-vessels; these are divided into the three following classes, viz. :—

The *first* comprehends articular cartilage of the different classes of fibro-cartilage.

The *second* comprises the cornea, the crystalline lens, and the vitreous humour.

The *third* class includes the epidermoid appendages, viz., the epithelium, the epidermis, nails and claws, hoofs,

hair and bristles, feathers, horn, and teeth.

The author then proceeds to show that the due action of the organs, into the composition of which these tissues enter, is incompatible with their vascularity. In proof of the non-existence of blood-vessels in these tissues, he states that he has demonstrated, by means of injections, that the arteries which previous anatomists had supposed to penetrate into their substance, either as serous vessels or as red blood-vessels too minute for injection, actually terminate in veins before reaching them; he also shows that around these non-vascular tissues there are numerous vascular convolutions, large dilatations, and intricate plexuses of blood-vessels, the object of which he believes to be to arrest the progress of the blood, and to allow a large quantity of it to circulate slowly around these tissues, so that its nutrient liquor may penetrate into and be diffused through them. The author states that all the non-vascular tissues have an analogous structure, and that they are composed of corpuscles, to which he is induced to ascribe the performance of the very important functions in the process of their nutrition, of circulating throughout, and perhaps of changing the nature of the nutrient fluid which is brought by blood-vessels to their circumference. The author then brings forward facts in proof of the active and vital properties of these corpuscles, and concludes his introduction by stating, that it appears to him that the only difference in the mode of nutrition of the tissues which contain blood-vessels and those which do not, is, that in the *former* the fluid which nourishes them is derived from the blood that circulates throughout the capillaries contained in their substance; whilst, in the *latter*, the nutrient fluid exudes into them; and that, in both classes, the particles of which the tissues are composed derive from this element, which nourish them.

The author then enters on an examination of the structure and mode of nutrition of the several tissues of each of these three classes.

Of the Joints.—In considering the first class, the development of articular cartilage is described at great length during its various stages and at the dif-

ferent periods of life. Numerous dissections of the ovum and fœtus are given in detail to illustrate the *first stage*, during which it is shown that no vessels enter into the substance of any of the textures composing a joint, but that the changes they undergo are effected by the nutrient fluid from the large blood-vessels by which each articulation is surrounded. In the *second stage* of the development of articular cartilage it is shown that the epiphysal cartilage is gradually hollowed into canals, within which blood-vessels are extended, which converge towards the attached surface of the articular cartilage: in this stage, vessels are also prolonged over a considerable portion of the free surface of the cartilage between it and the synovial membrane.

In the *third stage*, that which is exhibited in adult life, the epiphysal cartilage is converted into osseous cancelli. These contain large and very numerous blood-vessels, ramifying throughout the whole of their cavity, and are separated from the articular cartilage by a very fine but complete lamina of bone, the articular lamella, which is composed of corpuscles; and the author believes that the principal source of nutrition to the articular cartilage is the nutrient fluid eliminated by the large vessels of the cancelli, and which permeates the articular lamella. The free surface of adult articular cartilage is nourished by vessels which extend to a short distance over its margin, and between it and the synovial membrane.

It is quite certain that the vessels thus situated do not enter the substance of the articular cartilage, inasmuch as the arteries terminate in veins at the circumference of the latter. In this situation, the arteries become continuous with the veins in the following ways: firstly, by their all ending in a single vessel similar to the terminal sinus in the vascular area of the chick, from which the veins arise; secondly, the arteries terminate in dilated cavities, which give origin to veins: and lastly, the two sets of vessels are directly continuous by means of loops of various characters: the apparent object of all these modifications is to cause a considerable quantity of blood to circulate slowly in the vicinity of articular cartilage.

The author points out the presence of fine tubes which pervade the attached portion of articular cartilage: to these he ascribes the functions of transmitting through its substance the nutritive fluid derived from the vessels of the cancelli, and he also shows that articular cartilage becomes thinner as man advances in life, and that this change is effected by its gradual conversion into bone, a process which is always going on.

Fibro-cartilages constitute the second tissue of the first class: they are divided by the author into two classes; one comprising those which are not covered by a synovial membrane; the other includes those which have each surface lined by it. The structure of fibro-cartilage is carefully investigated, and in order to arrive at some definite conclusions on this subject, whereon anatomists of all ages have so much differed, he made numerous dissections of fibro-cartilages in the different classes of animals at various periods of their development, the results of which he details. He shows that this tissue is composed of cartilaginous corpuscles and of fibres; the latter preponderating in adult life, the former in infancy; and that during life the corpuscles are gradually converted into fibres. He enters at length into the question of the vascularity of these cartilages; and from a careful study of many injected specimens of man and animals at various periods of their development, the particular results of which he relates, he states that blood-vessels are contained only in their fibrous portion: these have the function of nourishing the part that is cartilaginous, which, being subject to compression and concussion, does not contain any.

The Eye.—The cornea, crystalline lens, and vitreous humour, each forming a part of the eyeball, are included in the second class of extra-vascular tissues.

1. The structure of the *cornea* is described as being very lax, and containing corpuscles only in a small quantity, mixed with bright fibres. The opinions in favour of its vascularity are combated, and it is shown that the blood vessels which converge towards its circumference are disposed in two different ways. Those which are the principal source of the fluid that nou-

ishes it, and which from their position may be styled the sclerotic-corneal arteries, are large and numerous; they are situated in the substance of the sclerotic, and they converge to the point where this latter structure joins the cornea, in which position, without much diminution in their size, they suddenly become contiguous with the veins that take a retrograde course.

A second set, the conjunctivo-corneal arteries, pass over a small extent of the surface of the cornea, where they form a narrow band: the arteries terminate by forming loops with the veins, and do not penetrate the substance of the cornea.

2. The *crystalline lens* is described as being composed of corpuscles, of which the radiating fibres are constituted. The *arteria centralis retinæ* is the source of nutrition to this organ; it ramifies over the posterior surface of the capsule in the form of large branches; these pass round the circumference, upon the periphery of which they become straight, and terminate by forming loops with the venous radicles.

3. The *vitreous humour* does not present any traces of vascularity, and although many anatomists have in general terms represented the *arteria centralis retinæ* as giving off in its course through the organ minute branches into its substance, still those who have paid especial attention to this subject have not been able to find such vessels. The author believes that the nutrition of this structure is accomplished by the vascular ciliary processes of the choroid, and that the fluid brought by the latter is diffused through its substance by means of the corpuscles of which its membrane is composed, assisted by the semi-fluid character of the humour.

Of the Skin, &c.—The third class of extra-vascular tissues comprehends the epidermoid appendages. The author describes them all as composed of corpuscles, which are round and soft where they are in contact with the vascular chorion, compressed and flattened where they are farther removed from it. He points out, in the substance of the hoof of the horse, the existence of fine canals, which he supposes to conduct fluid through its mass; and he states that the perspiratory ducts of the human subject possess a structure analogous to the

spiral vessels of plants. The author describes each of the tissues of this class, and shows that the various modifications presented by the vascular system with which each is in contact have the sole object of enabling a large quantity of blood to approach and circulate slowly around them. He also points out, in connexion with this subject, the remarkable vital properties which are possessed by these non-vascular tissues.

The conclusions to which the author of this paper arrives are the following:—

1. The articular cartilage of joints in a healthy state contains no blood-vessels and that it is nourished by the vessels which surround it; in certain diseases of the joints these vessels are prolonged into the substance of articular cartilage.

2. The fibro-cartilages of the joints and of the spine when healthy, contain blood-vessels only at their circumference; in disease they become vascular.

3. That the following structures of the eye—viz., the cornea, the crystalline lens, and the vitreous humour possess no blood-vessels in a healthy state; in some diseases of the eye the cornea becomes vascular.

4. The epidermis of the skin, teeth, nails, feathers, and the hoofs of animals have no blood-vessels. The hoof of the horse is pervaded by numerous fine canals which circulate a fluid throughout the whole of the substance, and give to it the elasticity so essential to the due performance of its functions.

The author states that his object has been to establish as a law in animal physiology, *that organs are capable of being nourished, and of increasing in size, without the presence of blood-vessels in their substance.*

The application of the above-named law to the study of *surgery*, in reference to the causes of the extension of vessels into the extra-vascular tissues of the eye and the joints, when in a diseased state, and to the measures to be adopted for the prevention and cure of those affections which are dependent thereon, and to *pathology* in the investigation of the nature of morbid structures, particularly of those classes which contain no blood-vessels, will, the author feels certain, be productive of scientific interest, and of practical advantage.—*Dublin Medical Press.*

MEDICAL JURISPRUDENCE.

On the Morbid Appearances in Arsenical Poisoning, &c. with Medico-Legal Observations, By T. G. GEOGHEGAN, M. D.—The increase of the crime of poisoning of late years has become not alone a matter of serious social import, but has tended to invest toxicological inquiries with an additional interest to the physician, both in his public and curative relations. Of the various substances resorted to for criminal purposes, the arsenical compounds rank undoubtedly foremost, both as to the greater frequency of their employment, and as relates to the delicacy, variety, and gravity of the questions to which they give rise in medico-legal practice.

The great importance of the study of arsenical poisoning clearly appears from statistical evidence collected in England and France.

Thus of 543 cases of poisoning which formed the subjects of coroners' inquiries in England and Wales during two years, 186 were of this nature.

Of 185 cases which occurred in France in fourteen years, 199 were arsenical.

Of 97 poisonings in Ireland which have been brought under my notice, and in which the special substance administered was determined, no less than 72 were arsenical, or three-quarters of the whole.

A case of this nature having been lately submitted to me, I propose, in the first instance, exhibiting the morbid parts to the society, (1) and afterwards to offer some general observations on the appearances which have presented themselves in other instances which I have investigated, together with some additional remarks on certain other points in the history of arsenical poisoning. The specimens laid upon the table is the stomach of a female past the middle age, who died from the effects of arsenic, under the usual symptoms of gastrointestinal irritation, after an illness of sixteen hours. The organ having been transmitted to me with a view to the detection of the poison, I observed the following appearances a week after death, at which period the body was exhumed, and found free from any trace of putrefaction.

The peritoneal coat presented a diffuse, a red, and towards the splenic end, a brownish tint. There was a marked

contraction of the muscular coat about three inches from the pylorus. An uniform reddish fluid (12 fluid ounces), of the consistence of thin gruel, and depositing brown flocculi, formed the contents, which were of an acid reaction, indicated freely the presence of arsenious acid in solution and included a considerable quantity of insoluble hæmatosine. The mucous membrane was found at the splenic end of a mottled reddish-brown colour, covering a stratum of coarse ramiform vascularity (in the submucous tissue,) soft, and presenting a few petechial ecchymoses, and one or two erosions (of the area of a fourpence,) with an undefined border, which exposed the unaltered submucous coat. The body of the organ (as far as the contraction) exhibited a remarkable arrangement of dark blackish purple streaks of extravasated blood, deposited in the substance of a softened mucous membrane, and capable of ready removal by the nail, which laid bare the sound submucous texture. These streaks (which affected for the most part the direction of the long axis) were of trivial thickness, scarcely elevated, flattened on the surface, and made up of a close aggregation of irregular blotches.—Amongst these lines there were interspersed a few of the lighter coloured *petechial* (fluid) ecchymoses, observed at the splenic end. The remainder of the mucous surface was of a brown red, which abruptly ceased at the contraction, between which and the pylorus, the membrane where untinged by bile was grey, and coated with viscid opaque mucus of the same colour. The mucous membrane generally was softened, not capable of being peeled off at the splenic end, but yielding on traction in the body and towards the pylorus, flaps of one quarter and half an inch respectively.—The submucous coat, except at the great tuberosity, seemed free from injection. There was no trace of true ulceration in any part of the organ. The mucous membrane of the *duodenum* was reddish and apparently a little thickened, and presented an oval ulcer of the size of sixpence, with a thick elevated edge, its surface exposing the submucous, and in the centre the muscular coat. As the patient had previously complained of pain in the region of the stomach, it is probable from this (and other considerations) that the above ulcer was the result of the antecedent disease.(2) The

softening of the mucous membrane in the present case seems referable to the prolonged action of the contents during a week's inhumation, and not to the influence of the poison, which, in my experience, has not been observed to produce that effect. The heart and lungs were reported to have been in a natural condition. The stomach at the end of four weeks was scarcely altered, as I shall further explain when alluding to the antiseptic influence of arsenic. I shall now proceed to the general consideration of the morbid condition which obtain in arsenical poisoning, confining myself on the present occasion to the stomach, both as being the organ which presents the most varied and striking appearances, and being also that which I have enjoyed the most extended opportunities of examining.(3)

The morbid alterations produced in the stomach by the action of arsenious acid, arising as they do either from its local influence as an irritant, or indirectly from its absorption, and being independent of any corrosive agency(4), cannot of course be considered distinctive. From this circumstance, however, they are well fitted to convey to the inexperienced examiner a correct idea of the appearances to be expected in irritant poisoning at large. To these common signs, there are occasionally superadded some of a peculiar nature, arising out of the physical properties of arsenic, to be afterwards described. The following results have been arrived at from the examination of sixteen fatal cases:—

1st. All (with one exception, in which maceration had altered the parts,) exhibited signs of irritation in the form either of—*a* vascular injection; *b*, ecchymosis; or *c*, coloration. The mucous membrane was engaged in fifteen; the submucous coats *also*, in five; the peritoneal in two; and the venous arrangement of the great extremity in one case.

The ramiform vascularity I have only found in the submucous coat, which seems also not subject to any of the other varieties of injection. The punctiform, or closely stellate, is by far the most common variety, occupying extensive tracts of mucous surface, and either uniformly distributed, or disposed in sinuous lines or scattered patches. The striated vascularity I have met with but in one instance.

2nd. Diffuse redness, although more

frequently present, according to my experience, than any other deviation from the natural state, I have not enumerated under the head of vascular injection since, without denying its occasional morbid character. I feel disposed to view it as a pseudo-morbid change resulting from the influence of transudation and imbibition on the punctuated vascularity. Accordingly, I have observed the latter to degenerate into diffuse redness by the influence of time and exposure to the action of stomachic contents. The diffuse redness may exist alone or in combination with other results of irritation.

3rd Ecchymosis as a consequence of arsenical poisoning has presented itself to my observation under the form of—*a*, well-defined blotches, oval, angular, or circular, and generally small; or *b*, of lengthy streaks, parallel or areolated. Both are formed of a thin stratum of altered, nearly black, and apparently coagulated blood, deposited in the tissue of the mucous membrane. They are scarcely elevated, and the (mucous membrane at the point occupied being much softened) are readily removed by gentle scraping, leaving behind an *erosion* of corresponding figure. A variety of ecchymoses, which I venture to designate the *pelethial* (seen in five cases,) is essentially different from the foregoing. It consists of invariably small and rather florid blotches of fluid blood, thinly scattered for the most part on the summits of the rugæ, and unaccompanied by softening of the membrane. This condition might be confounded by the inexperienced observer with the punctuated injection, from which, however, it is readily distinguished by the lens, which reveals the vessels of the latter.

The ecchymoses just described do not appear to me to result, as might be supposed, from the lodgment of small, masses, or particles of the poison on the mucous surface, which I have not observed in any instance. On the contrary, I have seen them produced by fluid poisons, as ardent spirits, &c., which can only act by creating a violent determination of blood to the entire surface and consequent rupture of the weaker vessels. One at least of these conditions may moreover exist, under circumstances in which the poison could have only reached the affected part by absorption, as in the external application of arsenic, or

where the spots involve the endocardial membrane.—The only effect which I have observed as strictly traceable to the local action of arsenic on the mucous coat is a fungous thickening (forming an elevated ridge or circular raised patch,) with or without the effusion of lymph, and surmounted by adherent arsenic. (5)

It is possible that the non-occurrence of sloughing of the mucous membrane, from the local contact of arsenic, is due either to its high vitality, or to a partial protection of its surface by these mucous or fibrinous effusions.

4th. Erosion of the lining membrane I have met with in one-fourth of the cases examined, and under two forms.

1. The circular. 2. Long narrow sinusous streaks. Both expose the submucous coat. The former, which generally occupies the splenic end, presents a soft undefined non-elevated margin free from red coloration. The margins of the eroded streaks, on the contrary, sharp. A careful examination of these erosions has impressed me with the belief, that they are produced by the removal of the mucous membrane where occupied by the black extravasation. Accordingly, they can be produced by gently scraping the latter; and in one instance (fatal in thirty-six hours) in which I found extensive linear erosion, a portion of the eroded surface was found still coated with the black matter.

I have never encountered true ulceration of the stomach in arsenical poisoning, although I have seen it extremely well defined on the posterior part of the buccal mucous membrane (in a case fatal in four days and a half.)

I have not been able to trace *softening* of the mucous tunic to the action of arsenic, not having seen it in cases examined sufficiently early to preclude the possibility of its pseudo morbid origin. From the great tenuity of the membrane at the splenic end, a very short contact with the contents will suffice to produce considerable softening, particularly, when the latter (as often occurs) have a decidedly acid reaction. In such I have witnessed from the latter cause, arsenical poisoning, another pseudo-morbid change; namely, extensive brownish black staining of the mucous surface of the splenic end, similar to what is occasionally seen from the action of oxalic acid. This arises from the influence of gastric acid (lactic?) on

the blood contained in the highly inflamed mucous surface, and a like color is imparted to the contents when bloody. Although softening of the mucous membrane appears not an equivocal result of the influence of the arsenic, to the latter may be referred :

5th. *Diminished adhesion* of the mucous to the submucous coat. This is best observed at the pyloric third, where traction will often furnish a flake an inch and a half to two inches in length, being probably three or four times the natural amount.

Having spoken of the mucous and submucous membranes, I have only to state, that in two instances I have observed diffuse red coloration, and in two capilliform injection of the peritoneal coat, without effusion of fibrine or serum.

The examination of the physical characters of the stomachic contents is a matter of much importance in medico-legal inquiries, and will be often found to elucidate, in a most unexpected manner questions, which may involve the life of an accused party. Thus, in one instance that fell under my notice, the determination of the nature of a solitary seed found on the mucous surface became of serious moment. In another the discovery of grains of shot in the colon, furnished me the means of affording sufficient legal evidence for the identification of a body buried several weeks, in which there had been no label affixed to the coffin, and where the countenance was too much altered to be recognized, except where the contents deposit grains of arsenic (which I have met in two cases), they do not for the most part present anything to distinguish them from those observed in other forms of non-corrosive irritant poisoning. For the more accurate information, however, of the more inexperienced inquirer, I subjoin (6) the numerical results of the conditions observed, promising that the most usual combinations of them are, probably—1. The thick, and turbid, and bloody, (insoluble hæmatisine,) and 2. The copious, viscid, and bilious, (brown or green). In alluding to the pseudo-morbid changes produced in the stomach at ulterior periods, the modifying influence of putrefactive gases on deposited arsenic, and the consequent formation of sulphuret arsenic, need scarcely be alluded to, being now

well known to medical jurists. A condition, however, of the mucous membrane has presented itself to my notice, which is capable of leading to mistake—namely, a copious deposit of adherent yellowish white crystals of *phosphate of magnesia and ammonia* on its surface. This occurred in a case of arsenical poisoning exhumed after forty-seven days, and was evidently a post-mortem change, as it was present also in the lining membranes of the heart (7)

The peritoneal surface, also of the liver in contact with the stomach, in some instances, presents a deposit of white spanular matter, (which in a case of arsenical poisoning, I have known mistaken for arsenic supposed to have transuded.) This I have found to consist of *sulphate of lime*. Its mode of production is not very apparent.

Although it is no part of my present purpose to enter into the subject of the detection of the poison, I shall conclude the notice of the stomachic contents by observing generally, that the mode of combination of the poison (when discovered) is also liable to alteration through the influence of circumstances which have come into operation antecedent to death. Thus I have seen in one instance, in which arsenious acid, taken by a suicide, become converted into arsenic of copper by the antidotal employment of sulphate of copper followed by albumen. Arsenious acid is, however, exempt from those alterations resulting from the action of animal fluids and tissues, which sometimes create difficulty in the case of other mineral poisons.

In the judicial examination of cases of arsenical poisoning, much attention has been excited of late years by the singular condition of preservation in which the digestive tube and (in some cases) the entire body has been discovered at comparatively remote periods after death. As such inquiries are of some importance to the practitioner in the exercise of his medico-legal functions, I shall proceed to relate the observations which I have been enabled to make.

A. In the cases in which the *whole body* has been the subject of inspection, the following conditions have been noted:—

1st. Complete preservation of the body and viscera (during periods of ob

servation of from sixty-three to seventy-two hours) under circumstances *highly favourable* to putrefaction.

2nd. Rapid putrescence of body and visera (under conditions extremely adverse to decomposition). (8)

3rd. Good preservation of the stomach and intestines; the body decaying as usual (at periods of forty-seven and seventy-five days after death, the illness having been of eleven days duration).

4th. Rapid decomposition of the alimentary canal; the body remaining unaffected. (Examination thirty-four hours after death; illness of fourteen days).

B. *The digestive tube*, or parts of it (removed from the body), has exhibited the undermentioned phenomena.

1st. Almost complete preservation of stomach (emptied of its contents) during four weeks, followed by modified decay during eight weeks, with neutral state of tissue, and terminating in ammoniacal decomposition. (9)

2nd. *Rancid putrefaction*.—I venture to apply this designation to a singular condition which I believe to have been not hitherto described, and which I have witnessed in three cases. It is characterized by a *peculiar odour* (somewhat like that of fatty matter when undergoing slow decomposition), and by a *persistent and strong acid reaction*, which, in a stomach still under observation, has been retained undiminished during more than three years and a half. I have found in these cases that the tissues retain their physical characters and morbid appearances unimpaired for some weeks, but finally become softened and discolored. (10)

In arsenical poisoning, as sometimes happens in other forms of death, the decay of the alimentary canal is not equal throughout; thus, in a case (fatal in less than a day) the intestines commenced to putrefy 24 hours after death (in cold weather), and on the third day the cæcum was advanced in putrefaction, the stomach remained unchanged—a circumstance perhaps due in that case to the presence of free arsenic on parts of its surface; yet the uterus and a portion of muscle which could have only contained the small quantity of the poison that reached them through the blood, were quite fresh on the fifth day. In comparing, however, the preservation of the different organs, due allowance should be made for diversity of tissue.

A careful examination of the cases which have occurred in my experience has led me to the belief that, with the exception possibly of those instances in which the poison in quantity is in direct contact with an organ (*e. g.*, the stomach) the preservation in structures, on the contrary, is not influenced by its presence or absence in their tissue. Thus I have found arsenic absent in the membranes of a stomach, which, after an inhumation of forty-seven days, was in a state of considerable preservation, and the great intestine, which afforded not more than one twentieth of a grain of arsenic, was in an equal state of integrity after seventy-five days. Arsenic was discovered freely in the liver, which was less preserved. (11) On the other hand, in recorded cases, in which the whole body has putrified rapidly, the presence of poison has been indicated in the fluids and tissues either by chemical examination, or (as in a case which I have witnessed) by the short duration of the illness having been incompatible with the elimination of the portion absorbed. The quantity of the latter, moreover, even in those organs which appropriate the greatest amount (*e. g.*, the liver), is absolutely small; not, perhaps, exceeding, on an average, from one and a half to two grains; and hence incapable of effecting their preservation by direct chemical union. I have been hence led to infer that arsenic, in most cases, produces its antiseptic effects, local or general, by means of a *catalytic* or disposing influence, in virtue of which such changes are produced, either in the molecular condition of the tissues, or in the atomic groupings of their ultimate elements, as confers on them a character of unusual stability. In concluding this notice of the post-mortem changes in arsenical deaths, I wish to allude to the alleged evolution of an alliaceous odour during the decay of the body. Although I have not met this condition in the body at large, I have perceived it most distinctly during the slow decay of organs which have received the poison by absorption—as the liver. I have no doubt that it is due to the evolution of arseniuretted hydrogen. (12) Some of the facts already cited, in association of a variety of others, are I conceive, incompatible with the hypothesis offered by Liebig as explanatory of the *modus operandi* of va-

rious mineral poisons (arsenic included), which assumes their deadly action to be due to a chemical union with the tissue of the different organs, and consequent arrest of those vital transformations within them, which are essential to the performance of their functions. That chemical combination of the poison with the tissues takes place I have satisfied myself with respect to the liver. (13) We are not, however, from hence legitimately entitled to infer, that such union is the cause of the usual symptomatic manifestations, and for the following reasons:

1st. The quantity of the organic tissue involved in such combination (compared with the mass of the organ) is excessively small, as already shown. (14)

2nd. The lesion of function is often inversely as the amount of poison contained in the tissue (as in the liver, muscular system, &c., compared with the brain and heart)

3rd. Life is often compromised in cases where the entire of the compound, which may have been formed by the union of the poison with the tissues, has been eliminated by the excretory organs.

The foregoing considerations, together with rapid disappearance of poisons from the blood, (15) lead to the inference that the depositions of the latter in the tissue of the secretory organs and in the muscular and osseous systems, so far from being the cause of the formidable manifestation observed, is, on the contrary, a beautiful provision for the allocation of those substances in parts in which their presence is productive of the least disturbance. Even in the now advanced state of physiological knowledge, it must be confessed that however definite our conceptions may be of the local action, absorption, circulation, distribution, and final elimination of poisons, the intimate nature of their influence on remote organs has yet to be determined. Thus, notwithstanding the ingenuity of modern theorists, we are still ignorant of the precise *modus operandi* of strychnia on the spinal cord, of tobacco or arsenic on the heart, or of opium on the brain.

There seems, meanwhile to be little reason to doubt that arsenious acid produces a profound disturbance in the molecular constitution of the blood—a disturbance which perhaps (through the agency of operations to be hereafter dis-

covered) influences certain classes of vessels, while others remain exempt. It may be also readily conceived that such disturbance may be perpetuated after the withdrawal of the exciting cause, and that hence an explanation may be afforded of the occasional fatal effects of poisons at periods posterior to their separation from the blood, or their final elimination from the system.

The late experimental investigations of Dr. Blake, and of Frierichs and Wohler, as to the absolute or comparative innocuity of *arsenic acid* (which is isomorphous with, and hence capable of replacing the *phosphoric acid* of the blood, without subversion of the molecular construction of that fluid), and the harmless nature of that singular organic compound of arsenic, cacodylic acid, afford some countenance to the views above stated, which I desire to be considered in the light of suggestions only.

(1) Read before the Surgical Society of Ireland Jan. 26, 1850.

(2) I examined not long since the duodenum of a gentleman between twenty and thirty years of age, who died of perforating ulcer of that part under circumstances incompatible with the supposition of poisoning.

(3) It is much to be regretted that the post-mortem inspection of the abdominal cavity, and in some cases to the *stomach alone*, and thus that much matter of great interest and importance in medico-legal history is lost. The appearances which I have had occasion to observe in the heart, lungs, and blood, have been in some cases remarkable.—In the first, endocardial (petechial) ecchymoses in both ventricles; in the lungs, intense congestion, approaching in appearance to pulmonary apoplexy and general bronchitis, which latter I have more than once found indicated by physical signs during life. The condition of the blood I have found variable, sometimes coagulated in the heart, and fluid in the great veins (as happens in various other forms of death,) and occasionally viscid in the pulmonary vessels. In one instance, examined ten hours after death, the fluid blood removed from the venous system coagulated in the receiving vessels, affording a milky serum.

(4) In the common acceptance of the term "corrosion," which is understood

to imply such chemical action as issues in alteration of the colour or consistence of the part, it is not, however, to be inferred from the absence of the latter results, that no chemical influences are mutually exercised by the poison and the mucous membrane; such, in the case of arsenious acid, are most probably in operation, and for aught that can be affirmed to the contrary, may be the cause of its irritant action on mucous, and its sphacelating effect on ulcerated surfaces.

(5) In one case (fatal in twelve hours) numerous patches of tough, coriaceous fibrine, some of them large size, were discovered strongly adherent to the mucous surface, which, to a corresponding extent, was intensely vascular and greatly thickened. In another there were two ridges much elevated (formed solely by the lining membrane) and crested with a mixed coating of arsenious acid and mucus.

(6) In sixteen cases the contents were—In 11 bloody; 9 turbid; 6 viscid; 5 bilious; 6 thick; 4 flocculent; 3 acid; 2 rancid; 2 fetid; 1 intensely so, without putrefaction, and apparently from stercoraceous regurgitation; 1 coffee-coloured.

(7) Professor Apjohn has examined a similar condition of the peritoneum.

(8) This occurred in the case of an individual who fell a victim to the accidental administration of arsenic after an illness of thirty-six hours. The weather at the time was decidedly cool; the subcutaneous cellular membrane notwithstanding was emphysematous (from putrefaction) twenty-two hours after death, and the intestinal canal in eight hours more, was much advanced in decomposition, of a dark green colour, and rapidly evolving gases of extreme fœtor.

(9) The case to which this observation refers is that recorded at the commencement of this paper. The poison appeared to be altogether in solution, and when modified decay commenced, the surface of the organ became coated with a pulpy matter. The morbid appearances, however, remained little altered. At this date (thirteen weeks after death,) the black extravasation is quite distinct, the walls of the organ firm on traction, and the peritoneal surface retentive of its lustre. The odour is different from that of common putrefaction.

(10) The absence of ordinary ammon-

iacal putrefaction is not confined to cases in which death has been produced by arsenical poison. I have found a stomach, which contained a quantity of vegetable matter (apparently apples,) undergo the acetous fermentation in its tissue, and retain it (although frequently washed) for several months. It is still singular that a fluid so prone to decomposition as urine, is occasionally imputrescible. Thus I have had a specimen (containing abundance of urea) which remained perfectly fresh for years, although kept in a vessel by no means air-tight. It perhaps included more saline matter than usual. I have observed much retarded putrescence in some other specimens.

(11) In this case, although the patient survived eleven days, the poison seemed present in as great quantity in the liver as I have found it in others which were fatal in a few hours. In an other instance, I detected the poison in the same quarter after an illness of fourteen days. It was, however, in much less quantity than usual.

(12) It was curious to observe that numerous minute insects that had attacked fragments of these organs (contained in a closed vessel), seemed in no wise incommoded by the atmosphere in which they were placed.

(13) The liver of the patient poisoned by arsenic (the organ having been divided into small fragments) was macerated in successive portions of distilled water, till all the blood and soluble matters were extracted; almost the entire of the poison was found in the insoluble residuary tissue.

(14) Were the quantity of absorbed poison sufficient to chemically saturate the proximate principles of our organs, the latter should in all fatal cases be imputrescible, which is contrary to experience. It is remarkable that, in poisoning by corrosive sublimate, which has such a powerful affinity for animal matters, the preservation even of the digestive organs is not effected by it, except at those points of the mucous membrane corroded by its direct contact; such, at least, is the result of my experience.

(15) In a case of poisoning by acetate of lead, in which two drachms were administered twelve hours before death, I was unable to detect a trace of the poison in the blood collected from the heart, although the heart itself

gave indications of its presence; while in the liver, kidneys, lung, and tissue of the intestine, it was readily discovered. The deposit of poison in the osseous system has been interestingly shown in some recent cases of animal poisoning. From this system, however, it is ultimately eliminated; thus I could not discover any trace in a portion of the femur of a girl who died on the fourteenth day, although I found it in the liver. The recent researches of Mr Millon (*Annales des Chimie*) on antimony, demonstrate that the latter substance remains (in some cases of tartar emetic poisoning) in the structure of the bones for several weeks, and also occasionally in the subcutaneous for I have searched for *arsenic* in the latter quarter, in the above case, without success.

British American Journal.

MONTREAL, NOVEMBER 1, 1850.

The Distinction between Right and Wrong, a Test of Insanity.—"Under the law of England, the substantial question in all cases, whatever the kind of insanity set up, as laid down by the most celebrated judges, was this,—Whether at the time the act was committed, the prisoner was capable of judging between right and wrong—whether he did or did not know that he committed a crime against the laws of God and nature, or to which punishment was annexed."—Mr. Justice Aylwin's charge on the trial of William Shutts for murder, as reported by the *Herald*.

There is scarcely a subject more eminently worthy the attention of the Legislator than that of Insanity, involving as it frequently does, questions of the gravest responsibility. In cases of murder, this plea is very frequently raised to shield the murderer from the consequences of his act. Indeed it has been so very frequently invoked in extenuation of punishment, as to have awakened the keenest suspicions of its reality in particular cases; and whenever urged, should with the greatest propriety be received with caution, and its grounds most nar-

rowly scrutinized. It is our firm impression that not every case of murder, in which the plea of insanity has been successfully urged in extenuation, has been one of impulsive homicide: equally so is it our belief, that the plea has not been advanced, or if so, not successfully maintained, in cases in which aberration of mind unquestionably existed. As an example of the latter, we may urge the case of Jones, a private of the 19th Reg. convicted of the murder of Corporal Fitzgerald, whose insanity, active at the time of the commission of the murder, terminated in utter dementia. This case, of late occurrence in this city, excited at the time very general interest, and was followed by the appointment of a *commissio de lunatico* which saved him from the scaffold. Under any circumstances, the greatest caution should be exercised in the acceptance or rejection of the plea, and in all cases, science as it is, not as it was some centuries ago, should be made to yield its tribute of information.

Of all the questions which can be submitted to the consideration of a medical jurist, there are none more perplexing than those involved in the existence or non-existence of insanity. It is a disease which, in its protean forms, defies the applicability of any single test; and although in early days of medical science, crude notions may have originated, and induced, the adoption of the test of insanity which heads this article, modern researches have completely exploded it. Of what use is the progressive march of science, unless it can be rendered available for beneficial ends—and it does seem to be a singular anomaly, that two such remnants of barbarism should still disgrace the statutes of English criminal law, as the definition and test of insanity just alluded to, and the empanelling of the jury of matrons to determine a question of pregnancy, which was actually put in practice in Aug. 1847, by Mr. Baron Platt, in London, in the case of Mary Ann Hunt. This highly respectable jury having duly investigated, reported—"the prisoner is not quick with

child," whereas her pregnancy was subsequently certified to by competent medical authority, whose opinion stayed her execution, an opinion which was in due time fully verified.

The subject of insanity has been so fully studied in France, America, and England, during the present century, as to leave but few questions connected with it unsolved, so far at least as they permit of solution. As a result of this close investigation, there is not one circumstance more fully established, than, that an inability to discriminate between right and wrong, is not only not a universal characteristic of the disease, but that the contrary is almost always present in cases of the description, termed by modern authors, moral insanity, in which the reasoning powers may be scarcely impaired, while the natural feelings, affections, or desires are so perverted as impulsively to lead to breaches of the moral law. This is a fact, as firmly and fully established by observations as a fact can well be; and yet in opposition to universal medical testimony concurrent on this point, because the law of England maintains the contrary, such testimony must be set aside, and these laborious investigations rendered of no avail. It is full time that this condition of matters should be altered, and that the jurisprudence of insanity should not be fettered as it is. We have no wish to quarrel with the Honorable Judge who defined what the law was on the subject. He was the expounder of the law, as it is, not its maker; but emphatically some wider, more generous views should be entertained in regard to this matter, founded on the generally recognised principles of science. Medical science, may, under certain circumstances, be truly said to be the handmaid of justice, and the latter cannot with propriety, accept some of the advances or improvement, which the former has made, and reject blindly others.

One of the most singular incongruities in reference to this subject, consists in the fact, that the law will readily recognise and admit evidence of insanity in

civil cases, which it stoutly rejects in criminal—that it has a willing and keen eye for it in cases of the former description, while it almost disdains a search for it in those of the latter. To a certain extent this is right; but it must not be forgotten that the practice may be carried too far, and that a too jealous administration of the law, which has thrown its *Ægis* around society to restrain the criminal, or punish him for his crime, may at the same time inflict a deeper—far more rankling—wound, by a bigoted sacrifice to form and precedent, of one victim of perverted reason. Let us not be misunderstood upon this subject. We do not belong to that sect of philanthropists who advocate the abolition of the death penalty for murder; but we do think that that movement owes its origin mainly to the ill-judged administration of retributive justice. Men's minds naturally revolt at the stern execution of a criminal, placed in that position by an act, for which, by a mysterious dispensation of Providence, he is not responsible; and in all cases, especially when the previous existence of insanity has been proved, and knowing well the strong tendency to relapse—if a doubt can be entertained, the prisoner should have the benefit of it.

Demonstrative Midwifery. — During the last session of the University of Buffalo, Dr. White the Professor of Obstetrics, adopted the system of Demonstrative Midwifery, practised in some of the European schools. The *graduating* class was alone present, and everything appears to have been conducted with the greatest decorum. Seventeen medical gentlemen of Buffalo, however, with greater zeal than discretion, openly stigmatized the proceeding as "wholly unnecessary, and grossly offensive alike to morality and common decency"; that it should not be "practised in any civilized community"; and wound up by administering what they were pleased to term "a severe rebuke" to Dr. White. Anonymous letters upon the subject, appeared also in some of the Buffalo daily

papers, animadverting in no measured terms upon the practice adopted at the University, and upon Dr. White as its author; until, finally, matters reached such a height, that an action for libel was instituted "by the people against Dr. Horatio N. Loomis, which was tried at the Erie County Oyer and Terminer, June 24, 1850. The report of the trial is exceedingly interesting, and embraces the testimony of a number of the leading Physicians of the United States, specially subpoenaed, almost every one of whom fully sustained Dr. White. The testimony was exceedingly strong against the Defendant, and although the District Attorney in his opening address condemned the course of the Defendant in severe yet appropriate terms—and although the charge of Mr. Justice Mallet, characterized as it was by legal learning and scientific research—was also against the defendant, yet the Jury brought in a verdict of "not guilty."

While we are unwilling to admit the slightest superiority in the mode of teaching Midwifery adopted by Dr. White, over that commonly practised, viz: personal bed-side attendance, as obtains most usually in all our Lying-in Hospitals, we do not intend to find fault with him in his adoption of the former method. The practice does, however, in our opinion, carry with it a violation of one of the fundamental rules of the lying-in chamber: that all *unnecessary exposure of the patient should be avoided*. The accoucheur's eyes should, in all cases of a *natural description of labor*, be at *his fingers' ends*; and the student's education in Midwifery should be perfected at his digital extremities. Entertaining these views, we do not approve of the *demonstrative mode* of teaching Midwifery; but we nevertheless cannot but most heartily condemn the conduct of the "seventeen" as one of the grossst breaches of professional decorum and courtesy, with which we have ever met, and displaying a degree of ignorance and presumption as to the practice of "civilized communities" for which we were wholly unprepared.

COLLEGE OF PHYSICIANS
AND SURGEONS.

QUEBEC, Oct. 8, 1850.

At the semi-annual meeting of the Board of Governors, of the College of Physicians and Surgeons of Lower Canada, held this day, at the School of Medicine, Quebec, there were present,

Dr. Blanchet, V.P.	Dr. Tetu,
" Von Iffland,	" Marmette,
" Hall,	" Brigham,
" Badeau,	" Peltier,
" Marquis,	" Jackson,
" Kimber,	" Russell,
" Sewell,	" Marsden,
" David,	" Morrin,
" Weillbrenner,	" Bardy,
" Nault.	

Dr. Blanchet, Vice-President, having taken the chair, the minutes of the meeting of the 10th July last, at Three Rivers, were read—as was also a letter from Dr. Francis Fortier, of St. Michel, District of Quebec, declining to accept of his nomination as one of the Governors, and tendering his resignation—which, on motion, was accepted.

Excuses for non-attendance at this meeting were offered by Drs. Johnston, Sutherland, Chamberlin, Fowler, and Arnoldi; which were accepted as satisfactory. The report from the committee named at the triennial meeting to examine the Treasurer's books, accounts, &c., reported that they had duly examined all, and found everything correct, and a sum of £133 10s. in the City and District Savings' Bank, at the credit of the College.

The committee to which was referred the matter of obtaining a testimonial of the late Dr. Arnoldi, reported at length recommending that a Likeness painted in oil, should be obtained, which report was received and adopted, and the committee empowered to obtain one.

Moise Sabourin, M. D., McGill College, having been duly sworn, was granted his License.

Richard P. Coffy, L. R. C. S. L., T. Boudreau, John Doherty, University of New York, J. Giasson, P. Desjardin, G. St. Armand, S. Payne, A. Beaupré, having been examined and found qualified were granted their Licenses; and ten gentlemen were remanded to their studies.

The following gentlemen were admitted to enter upon the study of medicine, viz:—Messrs. J. Franchere, P. St. Jean, Charles Chamberland, S. Goyette, Charles Buckley, O. Lancot, P. Pepin.

There being no further business, the Board adjourned.

P. M. BARDY,
Sec. Coll. Phys. & Surg. Dis. Quebec.

Toronto University.—We observe that this University has effected an important alteration in the Curriculum for its Medical Degree:—Students are not now obliged to pass through Arts before they can obtain honors in Medicine. In this respect, they now follow the Scottish system, which is the same that has been always adopted at McGill College. We regret, however, that in altering their Curriculum, they have not deemed it expedient to assimilate their system of instruction to that previously adopted in this section of the Province:

The Senate of the Toronto University have made some important alterations in the regulations relative to the course for obtaining Degrees in Medicine. We have been requested to publish them:

The only degree in Medicine to be here after conferred, shall be that of M. D., for which the requisites shall be—

1. Having taken a degree in Arts in this University, or in a University or College, the degrees of which are recognized by this University, or having passed the matriculation examination in Greek, Latin and Mathematics, and from and after the beginning of the year 1851—52, the Element of Natural Philosophy, before the Faculty of Medicine.
2. Having attained the age of 21 years.
3. Having been engaged in Medical Studies not less than four years; having

attended not less than two courses of Lectures, each of six months duration, on—1. Practical Anatomy, with dissections—Principles and Practice of Medicine. 4. Principles and Practice of Surgery. 5. Principles and Practice of Physiology. 6. Principles and Practice of Medicine. One six months' course on—5. Materia Medica and Pharmacy. 6. Chemistry.—7. Midwifery and diseases of Women and Children. 8. Medical Jurisprudence—and one three months' course on—9. Practical Chemistry—in this University, or in a University or College or School of Medicine recognized by this University.

One year of the four to be spent in attending Lectures in this University; and certificates for attendance upon *more than four or less than two* of the above subjects in one year will not be received.

4. Having attended the Medical and Surgical practice of a recognized Hospital for eighteen months, and Medical and Surgical Clinical Lectures during six months of the above time.

5. Having passed Examinations in all of the above subjects. The Examinations to be conducted by printed questions and *viva voce* examinations on the written answers, at the discretion of the Examiners

6. Having performed the appointed exercises, which shall consist of a thesis on some Medical subject, chosen by the Candidate and approved by the Dean of the Faculty, and the performance upon the Dead subject of such Capital operations as may be required by the Examiners.—*Patriot.*

Upper Canada School of Medicine.—We observe that a new school of medicine has been started in Toronto, making the third in that city. The lectures will be delivered as follows:—Midwifery, by Dr. Hodder; Anatomy, by Dr. Bethune; Medicine, by Dr. Bovell; Surgery, by Dr. Melville; Medical Jurisprudence, by Dr. Badgley; and Practical Anatomy, by Dr. Bethune. Clinical lectures will be delivered at the Toronto Dispensary; and Obstetrical cases provided at the Lying-in Hospital. The lecturers will illustrate their subjects by suitable preparations, diagrams and plates; and a choice and extensive Library will be at the disposal of the Students, under pro-

per regulations. From what we know of the character and abilities of the lecturers, we have no doubt that students will derive advantage from following these courses, We observe, however, that there is no lecturer on Chemistry.

McGill College.—By the removal of Doctors Badgley and Macdonnell from this city, and the consequent resignation of the Chairs which they respectively held in the University, appointments have necessarily followed. The chair of Medical Jurisprudence, held by Doctor Badgley, has been filled by the appointment of Dr. Arnoldi; and that of Clinical Medicine, held by Dr. Macdonnell, by the appointment of Dr. Sewell. The annual winter session in the Faculty of Medicine, commences on Monday, the 4th instant.

At the Annual Meeting of the Medico-Chirurgical Society, on the 5th October, the following gentlemen were elected officers for the ensuing year:—

President, F. C. T. Arnoldi, M. D.; First Vice-President, A. H. David, M. D.; Second Vice-President, Wm. Wright, M. D.; Secretary, George D. Gibb, M. D.; Treasurer, Wm. Sutherland, M. D.

Committee of Arrangement—W. E. Scott, M. D.; G. D. Gibb, M. D.; and R. P. Howard, M. D.

At the Annual Meeting of the Pathological Society, held on the 14th of September, the following gentlemen were elected officers for the ensuing year:—

President, - - H. Peltier, M. D.
Vice-President, G. E. Fenwick, M. D.
Secretary, - - G. D. Gibb, M. D.

METEOROLOGICAL REGISTER at MONTREAL, for the Month of SEPT, 1850.

DATE.	THERMOMETER.				BAROMETER.				WIND.			WEATHER.		
	7 A.M.	3 P.M.	10 P.M.	Mean	7 A.M.	3 P.M.	10 P.M.	Mean	7 A.M.	3 P.M.	10 P.M.	7 A.M.	3 P.M.	10 P.M.
1	+70	+88	+76	+79.	29.69	29.70	29.77	29.72	S	S	S	Clo'dy	Fair	Shw's
2	" 68	" 80	" 70	" 74.	29.81	29.76	29.73	29.77	S S E	S E	S E	Fair	Rain	Rain
3	" 61	" 74	" 66	" 69.	29.76	29.73	29.72	29.74	S S W	S S W	S S W	Fair	Fair	Fair
4	" 65	" 79	" 67	" 72.	29.71	29.65	29.69	29.66	S S W	S E by S	S E b S	Fair	Fair	Clo'dy
5	" 63	" 78	" 65	" 73.	29.60	29.49	29.62	29.54	S E b S	S W	S W	Shw's	Rain	Rain
6	" 64	" 77	" 67	" 70.5	29.67	29.65	29.52	29.69	W b N	W by N	W by N	Fair	Fair	Fair
7	" 63	" 70	" 65	" 71.	29.81	29.77	29.76	29.77	S b W	S W	S W	Fair	Fair	Fair
8	" 60	" 75	" 58	" 67.5	29.64	29.58	29.73	29.63	N W b N	N W b N	N W b N	Clo'dy	Fair	Fair
9	" 56	" 73	" 61	" 64.5	29.70	29.72	29.66	29.71	N W b N	W	W	Fair	Fair	Fair
10	" 58	" 78	" 63	" 68.	29.67	29.59	29.71	29.63	S W	SW by S	SW by S	Fair	Clo'dy	Rain
11	" 57	" 68	" 53	" 62.5	29.61	29.56	29.64	29.59	W	W	W	Rain	Fair	Fair
12	" 50	" 57	" 50	" 53.5	29.64	29.62	29.60	29.63	W	W N W	W N W	Shw's	Shw's	O're'st
13	" 49	" 61	" 51	" 55.	29.63	29.64	29.64	29.65	W	W	W	Clo'dy	Fair	Fair
14	" 50	" 65	" 52	" 57.5	29.66	29.68	29.68	29.68	W W W	W N W	W N W	Fair	Fair	Fair
15	" 52	" 66	" 51	" 59.	29.75	29.72	29.70	29.74	W	W	W	Fair	Fair	Fair
16	" 47	" 68	" 54	" 67.5	29.85	29.86	29.75	29.87	W	W	W	Misty	Fair	Fair
17	" 50	" 75	" 57	" 62.5	29.88	29.79	29.89	29.79	W	W	W	Misty	Fair	Fair
18	" 57	" 59	" 58	" 58.	29.59	29.53	29.71	29.55	S	S	W	Clo'dy	Rain	Clo'dy
19	" 56	" 69	" 56	" 62.5	29.48	29.41	29.54	29.44	S W	S W	S W	Clo'dy	Clo'dy	Rain
20	" 53	" 67	" 55	" 60.	29.49	29.58	29.43	29.60	S W	W	W	Clo'dy	Fair	Fair
21	" 52	" 68	" 57	" 60.	29.85	29.82	29.74	29.83	W by N	S W	S	Fair	Fair	Clo'dy
22	" 60	" 76	" 64	" 68.	29.79	29.73	29.82	29.75	S	S	S	Fair	Fair	O're'st
23	" 63	" 71	" 60	" 67.	29.72	29.74	30.73	29.72	S	S	S	Clo'dy	O're'st	O're'st
24	" 62	" 72	" 63	" 67.	29.57	29.44	29.70	29.51	N	N	N	Fair	Rain	Th'dr
25	" 47	" 58	" 42	" 52.5	29.82	29.81	29.53	29.81	N	N	N	Fair	Fair	Fair
26	" 38	" 55	" 48	" 46.5	29.88	29.77	29.81	29.81	E	E N E	N E	Fair	O're'st	Clo'dy
27	" 44	" 54	" 52	" 49.	29.72	29.55	29.78	29.49	N E by E	N E	N E	Clo'dy	Rain	Rain
28	" 48	" 59	" 47	" 53.5	29.27	29.29	29.20	29.35	W	W	W	O're'st	Rain	Clo'dy
29	" 39	" 48	" 43	" 43.5	29.64	29.72	29.49	29.73	W	W	W	Fair	Fair	Fair
30	" 40	" 50	" 47	" 48.	30.00	29.96	29.82	29.95	W	W	S W	Fair	Fair	Clo'dy
31	"	"	"	"	"	"	"	"	"	"	"	"	"	"

Therm { Maximum +88° on the 1st, at 3 P. M. | Barom. { Maximum, 30.00 in, on the 30th, at 7 A. M.
 { Minimum, +38° " 26th, at 7 A. M. | { Minimum, 29.20 " " 27th, at 3 P. M.
 Mean of the Month, +61.7 | Mean of the Month, 29.68 inches.

MONTHLY METEOROLOGICAL REGISTER, AT H. M. MAGNETICAL OBSERVATORY, TORONTO, O. W.—SEPTEMBER 1850.
 Latitude 43° 39' 4" N. Longitude 79° 21' 6" W. Elevation above Lake Ontario, 108 feet.—(For the British American Medical and Physical Journal).

Day	Barometer at Temp. of 32°			Temperature of the Air.			Tension of Vapour.			Humidity of the Air.			Wind.			Inch. of Rain.	Weather.	
	6 A.M.	2 P.M.	10 P.M.	6 A.M.	2 P.M.	10 P.M.	6 A.M.	2 P.M.	10 P.M.	6 A.M.	2 P.M.	10 P.M.	6 A.M.	2 P.M.	10 P.M.			
1	29.735	29.715	29.733	53.2	68.4	65.6	53.9	3.51	4.45	3.92	88	67	78	78	S	S	4.30	Densely overcast; heavy rain
2	29.749	29.691	29.661	49.6	73.2	56.4	62.6	3.30	3.57	3.92	66	66	83	83	S E	S E	—	Generally overcast; light rain
3	29.759	29.516	29.448	64.3	70.5	64.3	65.5	3.99	4.59	4.10	91	72	87	87	S	S	—	Mostly clear; sheet light; aurora
4	29.298	29.351	29.439	69.2	66.8	56.2	60.1	5.20	4.85	3.74	62	62	81	81	S W	S W	—	Clouds; thunder and lightning
5	29.614	29.601	29.712	61.0	67.0	62.7	58.5	3.44	3.91	4.02	93	60	90	90	S	S	.015	Generally cloudy; shower
6	29.730	29.639	29.689	53.6	70.8	66.6	59.5	3.74	4.65	4.27	93	77	85	81	S S W	S S W	—	Light clouds; dispersed clear
7	29.752	29.674	29.639	49.0	70.2	62.2	65.5	3.61	4.76	3.99	92	66	91	81	W N	W N	—	Generally clouded; Aur streams
8	29.620	29.630	29.630	61.0	68.0	62.8	57.3	3.51	4.41	4.41	92	90	88	88	W N	W N	.050	Mostly clear; a few passing clouds
9	29.642	29.635	29.747	48.6	64.7	62.4	54.6	3.11	3.62	3.62	92	90	92	92	W N	W N	—	Generally clouded; slight rain
10	29.642	29.635	29.747	48.6	64.7	62.4	54.6	3.11	3.62	3.62	92	90	92	92	W N	W N	—	Generally clouded; showers
11	29.642	29.635	29.747	48.6	64.7	62.4	54.6	3.11	3.62	3.62	92	90	92	92	W N	W N	—	Generally clear; few passing clouds
12	29.642	29.635	29.747	48.6	64.7	62.4	54.6	3.11	3.62	3.62	92	90	92	92	W N	W N	—	Generally clear; do do do
13	29.788	29.639	29.665	49.0	60.0	47.6	51.2	2.21	3.68	3.58	97	64	66	66	N W	N W	—	Am High passing clouds; clear
14	29.707	29.619	29.654	42.8	59.6	46.0	62.0	2.43	3.20	3.20	90	74	81	81	N W	N W	—	Am High passing clouds; clear
15	29.714	29.772	29.789	51.8	61.0	62.7	56.1	3.69	3.67	3.69	95	70	91	91	N by E	N by E	—	Am High passing clouds; clear
16	29.801	29.682	29.577	47.4	66.8	69.8	60.5	3.15	4.73	4.52	97	82	94	83	N by E	N by E	.070	Overcast; a beautiful day
17	29.421	29.307	29.418	46.6	72.8	61.0	60.2	4.91	3.91	3.91	91	75	87	87	N by W	N by W	—	Overcast; high clouds; light rain
18	29.421	29.307	29.418	46.6	72.8	61.0	60.2	4.91	3.91	3.91	91	75	87	87	N by W	N by W	—	Rain from 4 to 7 a.m.; clear at 7
19	29.489	29.373	29.413	48.3	68.8	65.0	63.5	3.00	3.82	3.82	83	78	91	80	N W	N W	—	Rain at 8 a.m.; day cloudy; V.C. clear
20	29.567	29.653	29.721	45.4	61.5	61.5	64.1	2.89	3.23	3.23	93	63	85	80	S W	S W	—	Am High passing clouds; clear
21	29.765	29.718	29.710	41.8	61.0	61.0	60.2	2.85	3.07	3.07	97	73	90	85	N E	N E	—	Am High passing clouds; clear
22	29.631	29.562	29.611	62.8	72.3	66.8	67.5	2.92	3.96	3.96	91	77	86	86	E by S	E by S	.050	Thunder storm from 6 a.m. and 10 p.m.
23	29.433	29.456	29.619	61.4	76.0	56.0	62.7	3.51	4.12	4.12	83	77	86	89	N W	N W	—	Thunder storm from 6 p.m. to 8 p.m.
24	29.766	29.721	29.619	49.8	56.7	51.2	61.6	3.14	3.83	3.83	91	81	84	84	E	E	1.00	Rain from 6 to 10 a.m.; day cloudy
25	29.616	29.607	29.613	46.4	67.4	49.2	61.4	2.91	3.14	3.14	74	73	91	83	N E	N E	—	Rain from 6 to 10 a.m.; day cloudy
26	29.420	29.483	29.287	48.4	55.4	52.4	52.7	3.14	3.09	3.09	91	95	95	93	E by N	E by N	.330	Densely overcast; rain till 6 p.m.
27	29.320	29.434	29.601	48.2	58.2	44.8	48.2	2.97	2.73	2.73	97	50	93	77	W N	W N	—	Generally clear; a few light clouds
28	29.934	29.701	29.891	31.0	63.4	44.6	46.2	1.74	2.23	2.23	90	56	80	80	N W	N W	—	A few clouds a.m.; clear p.m.
29	29.934	29.701	29.891	31.0	63.4	44.6	46.2	1.74	2.23	2.23	90	56	80	80	N W	N W	—	A few clouds a.m.; clear p.m.
30	29.934	29.701	29.891	31.0	63.4	44.6	46.2	1.74	2.23	2.23	90	56	80	80	N W	N W	—	Am High passing clouds; clear
31	29.934	29.701	29.891	31.0	63.4	44.6	46.2	1.74	2.23	2.23	90	56	80	80	N W	N W	—	Am High passing clouds; clear

Highest Barometer, 30.018 at 9 a.m. on 30th } Monthly
 Lowest do, 29.214 at 8 p.m. on 27th } Range, 0.774.
 Highest of the Temperature, 76.0 at 2 p.m. on 24th } Monthly
 Lowest do, 39.5 at 6 a.m. on 30th } Range, 46.5.
 Mean Air, Thermometer, 55.09 } Mean Daily range, 20.10
 Mean Air, do, 41.99 }
 Greatest Daily range, 42.1 from p.m. on 18th to a.m. on 19th.
 Warmest Day, 24th—Mean temperature, 67.43 } Difference, 18.74.
 Coldest Day, 30th—do, 46.20 }
 Warmest hour, 2 p.m.—do, do, 74.8 }
 Coldest hour, 4 p.m.—do, do, 49.20 } Mean Diurnal variation, 6.43 miles per hour.
 Mean diurnal variation, 6.43 miles per hour.

Sum of the Atmospheric Currents in miles resolved into the four Cardinal directions.
 North 1085.0
 West 1217.3
 East 621.4
 South 1336.1

Mean velocity of the Wind, 4.73 miles per hour.
 Greatest velocity, 21.2 miles from 11 to noon, on the 29th.
 Mean Windy day, 28th: mean velocity per hour, 9.57 miles.
 Least do, 2nd.
 Most Windy hour, 2 p.m.—mean velocity, 9.00 miles per hour.
 Least do, midnight.
 Most do, 2.06 do.

Year	Mean	Max.	Min.	Range.	No. of days	Inches	Snow—Inches
1840—	61.01	80.6	30.2	43.4	4	1.350	0
1841—	61.05	82.6	37.7	42.5	0	3.310	0
1842—	61.05	82.6	37.7	42.5	13	6.100	0
1843—	61.05	82.6	37.7	42.5	10	6.100	0
1844—	61.05	82.6	37.7	42.5	12	6.100	0
1845—	61.05	82.6	37.7	42.5	13	6.100	0
1846—	61.05	82.6	37.7	42.5	12	6.100	0
1847—	61.05	82.6	37.7	42.5	12	6.100	0
1848—	61.05	82.6	37.7	42.5	12	6.100	0
1849—	61.05	82.6	37.7	42.5	12	6.100	0
1850—	61.05	82.6	37.7	42.5	12	6.100	0