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ART. XLIII.—REMARKS ON THE SICKNESS AND MORTALITY AMONG THE EMIGRANTS TO CANADA IN 1847;

WITH SUGGESTIONS FOR AN IMPROVED METHOD OF REGULATING FUTURE EMIGRATION,

In a Letter to Sir William Burnett, M.D., K.C.H., F.R.S., Director-General of the Medical Department of the Navy.

By T. STRATTON, M.D., Edinburgh; Licentiate Royal College Surgeons, Edinburgh; Hon. Member Highland Society of Canada; Member Toronto Medico-Chirurgical Society; Corresponding Member Literary and Historical Society of Quebec; Surgeon, Royal Navy, Particular Service.

The number of emigrants that left the British isles for Canada, in 1847, was three times greater than that in the season of 1846. The sickness and mortality among them, have been very great; and the distress and destitution thereby accruing to the surviving relatives, have been such as to claim from the humane all their sympathy, and from those in authority all their ability to prevent or to remedy such evils.

The following is a copy of a report by Mr. Buchanan, Chief Emigrant Agent at Quebec, of the number of emigrants that arrived at Quebec and Montreal during the season of 1847, up to the 10th of November, and compared with the total number that arrived in 1846; there is also stated the mortality in 1847:—

Embar- ked from	Steer- age.	In- fants	Cabin	1846. Total.	Steer- age.	In- fants	Cabin	1847. Total.
Scotland,	1494	31	120	1615	3462	174	116	3752
England,	8435	455	273	9163	29833	2305	190	32338
Ireland,	20169	673	207	21049	51129	2835	365	54329
Germany,	875	21		896	7458	226	13	7697
Total.	30973	1180	600	32753	91852	5540	684	98106
Deduct last year's emigrants.					30973	1180	600	32753
Additional number in 1847.					60909	4360	84	65353

Number that died on the passage,	5,293
Admitted into Grosse Isle Quarantine Hospital, of whom died,	3,452
Died in Quebec Marine and Emigrant Hospital, and in the city of Quebec, up to 9th October,	1,041
Died in Montreal Emigrant Hospital, and in the city of Montreal, up to 1st November,	3,579
Total deaths,	13,365

(Signed.)

A. C. Buchanan, Chief Agent.

Up to the 1st of November, and as far inland as Montreal, one emigrant in every seven had died; many of those who passed on from Montreal, sickened and died at one or other of the different places on the route—Prescott, Brockville, Kingston, Toronto, St.

Catherines, Brantford, New London, or Amherstburg; and during November and December, there have been many deaths in the different emigrant hospitals, so that it is understating the mortality to say, that of those who left Britain, one person in every five, was dead by the end of the year. The number that died on the passage is 5,293. I believe I am correct in stating, that only three or four ships carried surgeons, so that almost the whole of this large number, died in a situation where there was no medical aid. The proportion of passage deaths to passengers is about one in eighteen, which is in sad contrast to what it was a few years before, when it was one in two hundred, (as stated by Mr. Hawes, quoted in Dr. Combe's excellent letter on Emigration, in the *Times* of 17th September, 1847.)

In the Kingston (Canada) Emigrant Hospital, from the beginning of the season up to the 18th of October, there were 1959 admissions, and 707 deaths, the mortality being 35 per cent., and there remained 431 patients in hospital.

In the Toronto Emigrant Hospital, up to the 22nd of October, there were 3300 admissions, and 757 deaths, being about 22 per cent., and 739 patients remained.

SICKNESS.

In the ships where there was so much mortality, (in some vessels one-third, and in others, three-fifths of the passengers died,) there was, of course, among the other passengers a great amount of sickness, weakening them for one, two, or three months, and incapacitating them for labour on their arrival in America.

CAUSES OF THE SICKNESS AND MORTALITY.

The sickness and mortality were almost entirely from fever, (typhus fever, and that variety of it called ship-fever,) and dysentery, and in some of the ships sailing from ports in Ireland, or from Liverpool, with Irish emigrants, we may reasonably suppose that some of the passengers might embark infected with typhus, and this would, in a week or so, develop itself, and afterwards spread among the passengers. Dysentery arises sometimes from improper and imperfectly-cooked food, and, in certain circumstances, it, also, is occasionally

infectious, so that it would, perhaps, spread in the same way as the fever.

The spreading of these diseases would have been much less, if it had not been aided by want of medical advice—an over crowded state of the ship—an absence of due cleanliness—want of exercise on deck—and of proper cooking of the food.

But, on the other hand, in many of the ships, there is no reason to suppose that typhus, or its infection, or dysentery, was embarked, and the fever which appeared after leaving port, is sufficiently accounted for, by the over-crowding, and the deficient ventilation, aided by the predisposing cause of low diet. Typhus arising in this way, afterwards spreads by infection, and so the remaining passengers ran two chances of being taken ill—that is, from the original cause, and from infection.

The same remark may be made regarding the dysentery; it would, in the first instance, arise from the uncooked victuals, and improper diet, and would then both continue to be produced by the original cause, and, perhaps, also be communicated by infection.* The sickness from embarked typhus, or its infection, and from dysentery, might have been much checked, and the sickness from typhus, or dysentery, springing up on board, might have been prevented by proper regulations. In some ships, from obstacles thrown in their way with regard to cooking, and, in others, from laziness, carelessness, or whatever it may be called, the passengers often did not cook their provisions at all. In others, in obeying the calls of nature, they invariably did so into the hold, and sometimes would not even leave their sleeping-berths; sometimes they would not allow the captain or crew to come down among them, afraid of being forced to wash, and to go on deck; in others, again, they were smoked out, and so forced to go on deck; and however well-intended on the part of the master this may have been, it cannot be forgotten that some, and, perhaps, many, may have been too weak either to move, or, even to be moved. Considering all these things, instead of wondering that the mortality was so great, we may feel surprised that it was not greater.

THE PASSENGERS' ACT.

The Acts of the Imperial Parliament by which emigration to North America is regulated, are the *Passengers' Act*, which was passed on the 12th August 1842, and the *Amended Passengers' Act*, which was passed on the 22d July 1847. Of the former Act—

Section 2. Exempts passenger-ships to North America from having to carry a surgeon. It prohibits a ship

* Some physicians consider that dysentery is not infectious; others, that it is so, occasionally; and others, again, that it is so, only when complicated with infectious fever.

from carrying more than one person to every five register tons; and it enacts that, on the lower deck, each passenger is to have ten superficial feet of space “unoccupied by stores not being the personal luggage of passengers.”

Note.—Ships ought to be obliged to carry surgeons, in cases to be afterwards mentioned. The Act ought to specify so many cubic feet of space for each passenger, exclusive of the space occupied by his personal baggage, for most emigrants have large chests or boxes taking up the room allowed for their owners. These boxes are often nearly empty, or, at best, contain apparel of little value even to those to whom they belong. This defect in the Act is a most important one, and ought to be immediately rectified.

Section 4 and 5. Omit to regulate the height of the berths, and also the distance between any two rows of berths.

Note.—The height of the lower deck is said to be six feet, and the floor of the lower berth six inches above the deck, so that each berth ought to be, at least, two feet eight inches high. The space between any two rows of berths might be six or more feet.

Section 6. Provides that provisions be issued not less frequently than twice a week, and the following is the scale to be issued by the ship to those passengers who do not provide their own provisions: one pound a day of one of the following articles, namely, bread, biscuit, flour, oatmeal or rice, and half of the diet may be of potatoes, and five pounds of potatoes are to be considered as equivalent to a pound of one of the other articles.

Note.—Considering the improvidence of most of the emigrants, only one day's provisions ought to be issued at a time, as, when issued only twice a week, many of the passengers consume on that day the three or four days' provisions, and starve on the other days, and so injure themselves in three ways. Firstly, having nothing to eat on five days in the week; secondly, eating too much on the other two days; thirdly, when the intestinal canal is not distended by food to the usual extent, and on one day a quantity of it, and perhaps of a hard nature (as ship-biscuit), is eaten, painful distension of the canal, or griping, or inflammation, is apt to be induced. This irregularity in diet is also favourable to the production of diarrhœa and dysentery.

With regard to the *quality* of the diet:—Bread may be left out of the question, as, for any great number of persons on ship-board, there is no convenience for baking it. Oatmeal is much preferable to wheat flour, and care ought to be taken, and very often is not taken, that it be cooked properly, and not taken with cold water only, and also that it be eaten with salt. Taking the diet as above, a good arrangement of it might be, on three days a week, half diet of potatoes, and half diet of oatmeal; on two days, biscuit; on one day, flour; and on another day, rice; and any deviation from this, to be towards oatmeal.

But with respect to the *quantity* of provisions, the

above scale may do on an emergency, or for about a week; for a fortnight, double the quantity might be issued, and for any longer period, about three times the allowance would not be too much for the purpose of landing the emigrants in the state of health and vigour necessary for their immediately engaging in laborious occupations. Tea and sugar ought to be issued daily, and beef or pork, if not daily, ought to be granted twice or thrice a week. A sufficiently full and varied diet will keep the emigrant in good health, and enable him to provide for himself and his family on his arrival; while an unvaried diet, insufficient in quantity, predisposes him to disease, or actually induces it; by a moderately liberal scale of victualling, the interests of both humanity and economy are at the same time served.

The scale in the Act was intended only for the emergency of the emigrant after his private stock of provisions might have been exhausted. In the past season, many emigrants embarked without any private stock at all. Either from their private store or from the ship, a suitable scale of diet might be, daily, a small quantity of potatoes or other vegetables; tea and sugar sufficient for a morning and an evening meal; a pound of bread, oatmeal, biscuit, or flour, and half a pound of beef or pork, the latter with pease-soup.

Section 10. Speaks of "the victualling of the crew and other persons (if any) on board."

Note.—The master, crew, cabin and steerage passengers, ought to be all numbered together; referring to "other persons," is giving an opportunity for the vessel to have more passengers than the Act is intended to allow.

Section 13. In prescribing the number of boats to be carried by ships of a certain size, it might be specified that the boats are to be able to carry about *so many* persons, as a ship may observe the *wording* of the Act, and still have boats unusually small, and insufficiently large for the object in view.

Section 18. Allows a ship that has cleared with an insufficient number of passengers, to embark others at other places, where there may be no custom-house officer, or emigration-agent, and consequently no check on the vessel's carrying more than the allowed number.

I heard of a ship that cleared with the full number of passengers, and then dropped a few miles down the river, and in the dusk, a number of carpenters came on board with wood, and in an hour or two, put up rows of berths in places where there was properly no room for them; then about 100, or more, emigrants came on board, and the ship sailed.

Section 51. States that "cabin-passengers" are not included among the "passengers."

Note. However the second section numbers the master and crew along with the passengers; they ought to be all numbered together, otherwise it leaves an opening for "evading the Act," as, if a ship has more than the allowed number of steerage-passengers, some of

them, during the time of inspection, may be passed off as cabin-passengers, and others, as belonging to the crew.

Having thus made a few remarks on what is contained in the Act, I now beg to offer some observations on what is omitted in it.

The Act ought to prohibit the washing of the lower deck oftener than once a week, and not even then, without previously obtaining permission from the surgeon; the deck to be washed *after* the passengers have breakfasted, and before noon, and with no more water than is absolutely necessary. Much disease is produced on board ship, by the too frequent washing of the lower deck; too much water also is generally used, and the consequence is, that a deck has hardly time to dry till it is washed again.

The bad results of this system are well known; catarrh, rheumatism, and other complaints are induced in the case of robust seamen, and still more readily in the instance of women and children, and this for two reasons, both on account of their weakness, and from their being more in the damp atmosphere. In some of the emigrant ships, the washing of the lower deck interfered with the cooking of breakfast, and when delayed till the afternoon, the deck is not dry by the usual time of retiring to rest.

The Act ought to prohibit any sailing ship that carries more than 40 or 50 steerage-passengers, from leaving Britain for British North America at a date in the season later than the 1st of August (perhaps the 1st or the 15th July would be a better date), as when vessels arrive in October or November, emigrants have no time before winter, to settle on land, or easily, to obtain employment. The ship *Lord Ashburton* with 470 passengers* from Liverpool, arrived at Quebec on the 1st of November, and the *Richard Watson*, with 170 passengers from Sligo, arrived at the same port on the 7th November, a date much too late. In the latter vessel, there were several deaths from cold, some of the children having no clothing whatever, and their relatives not being able to spare them any of their own.

THE AMENDED PASSENGERS' ACT.

This Act makes the *Passengers' Act* apply to vessels carrying more than one person to every 25 register-tons, the former Act referring to thirty tons.

OF THE EXPENSE OF THE EMIGRANT HOSPITALS IN CANADA IN 1847.

I am informed, that up to the end of December, the expense of the Grosse Isle Quarantine establishment, and of the Emigrant hospitals in various parts of the province,

* Of whom 64 died on the passage; by the time they reached Montreal there were 120 deaths among them; in this ship the custom was for the passengers to eat their provisions uncooked.

has amounted to about £100,000 sterling, which is more than one pound sterling for each emigrant that left Britain for Canada; besides the above outlay by Government, there are the expenses of private subscriptions for maintaining widows and orphans. I am inclined to think, that by an improved scale of diet, and by every ship carrying a government-surgeon, nearly all of the above sickness, mortality, and expense might be avoided, and this at a cost which would be, perhaps, a tenth, or at most a fifth of the expenditure caused by the emigrant sickness in 1847.

OF APPOINTING SURGEONS TO EMIGRANT SHIPS TO NORTH AMERICA.

There are, at present, two things wanted in emigrant ships to N. America, one is, to have a government-agent on board to prevent too many persons being embarked, and to see that the passengers have justice done them, with respect to their provisions, water, accommodations, convenience for cooking, ventilation &c; the other desideratum is, to have a surgeon, and some consider that it would be difficult, or impossible to procure as many medical men as would be required for the purpose, and there certainly will, and ought to be great difficulty in doing so, if the remunerating of them be left in the hands of the ship-owners, who have not the inclination to pay them according to the value of the services rendered.

The advantage of having a government-agent, and also a surgeon, may be conveniently combined, by the Act requiring that every sailing-vessel to N. America, which carries more than 60 persons (master, crew, cabin and steerage-passengers included) shall have on board a naval medical officer, who shall be in the same position, and have the same charge and responsibility as the surgeon-superintendent of a convict-ship. A sum equal to his pay and expenses, might be charged by Government to the ship, and he, appointed and paid by the Admiralty, would be independent of the owners, and would see that the passengers were fairly treated in all respects, and that no more than the allowed number was embarked.

To ships carrying under 150 passengers (crew, cabin and steerage-passengers included), there might be appointed an Assistant-Surgeon of the Royal Navy of at least four years' standing; he, to have full-pay from the date of appointment, and for five weeks after the ship's arrival in the destined American port: to have travelling expenses from London, or elsewhere, to the British or Irish port of departure; to mess in the cabin with the master, and at the ship's expense; his connexion with the ship to cease on the emigrants leaving it; to have certain travelling expenses from Quebec, &c., to New York, Boston or Halifax, for the purpose of proceeding

home by the first Halifax Mail Steamer, and in which his passage would be paid; also, that his remuneration might bear some proportion to his trouble, he might have allowed him some sum, say five shillings for each passenger landed in America.

To ships carrying more than 150 persons, a Surgeon of the Royal Navy to be appointed as above.

It has been said, that it would be impossible to obtain a sufficient number of surgeons for emigrant-ships, and certainly, even if sufficiently well paid, it would not be an easy matter to procure, from among civil surgeons, a sufficient number, as it would never answer for a private practitioner to leave his practice for a few months, to embark on this service. But by having recourse to the navy medical department, there would be no difficulty; as on their return to Britain, if these medical officers did not make a second American voyage that season, some naval appointment would perhaps be falling vacant, or, in any case, they might, in the usual way, go on half-pay, for a short season. The period of service in emigrant-ships ought, of course, to count the same as service in one of Her Majesty's ships.

SUGGESTIONS FOR AN IMPROVED EMIGRATION SYSTEM.

I may now recapitulate some of the amendments I beg to propose on the present mode of conducting emigration to North America:—

1st. Every sailing vessel carrying more than sixty persons, to have on board a naval medical officer.

2nd. No sailing vessel having more than 40 or 50 steerage passengers, to be allowed to leave the British Isles for British North America at a date in the season later than the 1st of August, (perhaps the 1st or 15th of July would be a better date.)

3rd. The present scale of provisions to be re-considered, and the question entertained, whether it might not be made greater in quantity, and more varied in kind, with advantage, not only to the emigrants, but also to Government.

4th. Each passenger to have so many cubic feet of space, exclusive of the room occupied by his personal baggage.

5th. Several other corrections of, and additions to, the *Passengers' Act*, are given above, and I may now conclude these brief remarks with observing that although this letter be addressed to Sir William Burnett, M.D., I have introduced some medical details and explanations, from considering that it may come under the notice of non-professional readers.

For the last four months, since August 1847, I have been constantly engaged, professionally, in the emigrant hospitals of Grosse Isle, Quebec, or Montreal, and have

had ample and varied opportunities of witnessing the condition of the emigrants, both healthy and sick.

I have been occupied in making observations on the disinfecting fluids of Sir William Burnett, M.D., and of Mr. Ledoyen, the former of which is composed of the chloride of zinc, and the latter of the nitrate of lead; and after a sufficiently long observation of the effects of both, I give a decided preference to the fluid of Sir William Burnett.

The solution of the chloride of zinc possesses several great recommendations, and these are not counter-balanced in the least by any inconvenient results. It is much superior to the solution of the nitrate of lead, both, positively, and also on account of Mr. Ledoyen's fluid, like the other preparations of lead, being liable to produce one or other of their long-known bad effects, such as colic, palsy, apoplexy, wasting of the body, permanent decrepitude, and particularly in typhus, a depressing effect which is the exact opposite of the one that is required in that disease. The proprietors of the Ledoyen fluid used it in considerable quantity in three cases of typhus; cloths wet with it, were applied to nearly the whole surface of the body. These three cases were, I believe, the only instances in Canada where the fluid was much applied to individual patients ill of typhus, and all of them ended fatally.

Laying aside, for a moment, considerations of humanity, it is, indeed, singularly absurd and ridiculous that the proprietors of Mr. Ledoyen's fluid should have recommended it as a certain cure for typhus, when it so happens, that on account of its sedative and depressing effects, it is positively injurious, and apt to be fatal.

On the lower decks of emigrant-ships, ventilation ought to be as much attended to, as the weather will permit, and it will be highly conducive to comfort and health to use Sir William Burnett's Fluid daily. The proportion of one ounce of the strong fluid to every ten persons, is sufficient in ordinary cases; where there is much dysentery, twice or thrice this quantity may be used.

During the past season, in Canada, a great many medical men, clergymen, magistrates, and others, have died of emigrant-fever; and, emigrants going out as servants to places in the country, have, soon after, taken fever, and died; and the disease has extended itself fatally to several others in the house.

I have written these brief remarks in the midst of more pressing engagements, and have not done the subject the justice which its importance merits; but I hope I have said enough to show that there are two ways of managing British Emigration to North America. One is that of imperfect regulations, imperfectly

carried out, the consequences of which are, great sickness and mortality among the emigrants, both on the passage, and after their arrival; distress and destitution among the surviving widows and orphans; the loss of many valuable lives in Canada from the spread of emigrant-fever throughout the Province; expense to private individuals in providing for widows and orphans, and the outlay, by Government, of about £100,000 sterling, in supporting emigrant hospitals. And, on the other hand, I have endeavoured to show that, by amending the *Passengers' Act*, as is herein proposed, all the above evils may be entirely, or almost entirely prevented; added to which, the expense of the plan would probably be about one-tenth, or one-fifth of the sum that the emigrant sickness of 1847 has cost, and a successful attention would thereby be given to the interests, both of humanity and of economy.

T. STRATTON, M. D., R. N.

Montreal, 1st January, 1848.

P. S.—Since the above was written, it was officially announced on the 2nd of March, in the Legislative Assembly, that for the relief of emigrants this season, there had been already expended the sum of £148,000 currency, and about £12,000 more remained to be paid. Besides this total of £160,000 currency, or £131,000 sterling, the expense of the emigrant hospitals for ten weeks more, up to the middle of May, properly belongs to the season of 1847.

T. S.

Montreal, 4th March, 1848.

ART. XLIV.—ON THE USE OF DIGITALIS IN THE CACHEXIA, OR WASTING DISORDERS OF CHILDREN.

By WILLIAM WINDER, M. D.,

Member of the Medical Society of Guy's Hospital, and the Eclectic Society of London; and of the Statistical and Polytechnic Societies of Paris.

“Class III. Cachexia. Order 1. *Atrophia* (68), *Marcor et asthenia, sine pyrexia hectica.*

2. *Atrophia (famelicorum) a nutrimento deficiente.*
3. *Atrophia (cacochymica) a nutrimento corrupto.*
4. *Atrophia (debilium) a nutritionis functione depravata, progressu nullo vel evacuatione nimia, vel cacochymia.—Cullen. Nosolog. p. 127.”*

It may be fairly assumed that the state of the constitution of children, which is termed that of lymphatic susceptibility, is more particularly apparent during the period of infancy, because at this time the lymphatic part of the frame is especially called into action.

It is in this kind of constitution that those glands, which are situated on the mesentery, and indeed the whole lacteal, as a portion of the lymphatic system, come to be affected,

The disordered action which is going on here, prevents the due transmission of chyle; there is a resulting want of a due supply of blood; the bony formation does not proceed with freedom; there is in consequence a tendency to rachitis; emaciation occurs; the abdomen is hard and swollen; the child is peevish and fretful, because the nervous development partakes of the irregularity in the blood-vessels, as well as distention and uneasiness about the stomach and bowels from the immediate consequences of interrupted function.

Thus we see how lymphatic debility, in the infantile constitution, becomes both cause and effect of disease of the stomach; and the wasting of flesh and strength, under these circumstances, is sufficiently explained, if it is remembered, that the lymphatic system comprehends the lacteals, or those vessels which convey nutriment to the blood, together with their glandular appurtenances.

It is, however, during an intermediate state of disease, that medical interference is often of such decided service in removing the series of disordered movements, and rescuing the infant from the brink of destructive disease.

Children are often seen in this state, in whom the amount of disorder is sufficiently obvious, and the remedial indications equally so, but about which we are puzzled when called upon to give the *name* of the disease.

The Greek physicians called it "Cachexia," signifying a "bad habit;" and Cullen has a class, in his Nosology, so named, which he defines as, "Totius vel magnæ partis corporis habitus depravatus; sine pyrexia primaria, vel neurasi." It is, in fact, a condition of general disorder, the morbid excitement of which has been set up from an original derangement of the assimilating organs, and which will, sooner or later, settle into an organic malady, if the proper mode of treatment is delayed.

In such cases our remedial measures must commence by a reformation of the diet. A modern author has observed, that the adaptation of the general principles of dietetics, to the treatment of different diseased conditions of the human system, must be regarded as no secondary duty of the medical man, and no inconsiderable and unimportant means of restoring health, and preserving life. The avoidance of a dietary that is unduly stimulating on the one hand, or defectively nutritious on the other; the maintenance of strength, the restoration of waste, the provision for the growth, with the least expense to the organs of assimilation, the least risk of irritation to the excitable mucous tissue, are points to be arrived at by dietetic management, and to secure which must be a sanatory gain of no secondary importance.

If, then, we are consulted on the health of a child in the cachectic state before described, and find that it is dyspeptic, and wasting away from the mother's inability to supply a good breast of milk, the substitute of a healthy nurse must be provided, or even breast feeding be given up altogether, and the infant sustained by farinaceous food, little disposed to ferment. In the general way, milk with grit gruel, rusks, biscuit, or barley powder, and arrowroot, are the best materials with which to form the food for the first six or seven months. Milk should, however, constitute the main part of the aliment, and where this alone seems difficult of digestion, it should be mixed with barley water in equal proportions. Supposing, then, the errors in diet to have been corrected, what are the other remedies of which the preventive and restorative process should be composed?

In my pathological views of the disease in question, I assume *torpor*, in conjunction with irritation; that is, while there is a general sluggishness over the whole body, there is a degree of activity in the blood-vessels which requires to be checked.

This is a medical theory which may, or may not be correct, but upon which I have long used a remedy, that has shown unequivocal efficacy in accomplishing the purpose for which I have employed it. The remedy to which I allude is digitalis, and its beneficial influence in cases of emaciation in children, conjoined with irritation of the circulation, I am disposed to attribute to the principle, that while the lymphatic organization requires excitation, the arterial impulse demands restraint. We must stimulate the one, and depress the other. Whatever may be the mode of explaining the action of digitalis in the cases supposed, I am certain of the fact, that under its use, the quick, inflammatory, irritable pulse, assumes gradually a slow, equable character, the lymphatic torpor is overcome, the swelled abdomen subsides, and the child, from having been drowsy and feeble, becomes lively, and, comparatively, strong.

The following are the formulæ in which I have ordinarily prescribed digitalis for the state of disease, or constitutional disturbance before-mentioned:—

1. ℞ Potassæ nitratis ʒj. Vini. antimon. ʒj.; Tinct. digitalis gutt. xvj.; Syrup. simp.; Aquæ puræ aa ʒj.; Misce. ʒj. ter quotidie.
2. ℞ Potassæ nitratis ʒj.; Tinct. scillæ ʒj.; Tinct. digitalis gutt. xvj.; Syrup. simp.; Aquæ puræ aa ʒj.; Misce., Dosis ʒj. ter quotidie.

In thus recommending digitalis for wasting disorder in children, I must not be understood as either limiting my practice to its administration, or as holding it up as a panacea, or applicable to all cases.

The liver in these disorders is almost constantly affected, and doses of mercurials are frequently called

for. Of these there is none more sure and efficacious, than the *hydrarg. cum creta*. Two grains of this every night, or every second night, for a child of two years old, and a drop, or two drops, of the tincture of digitalis, three times a day, gradually increased to three or four, will, in general, be found sufficient to produce a marked good effect in the condition of the patient. When an aperient is required, the following will be found of service:—

℞ Tinct. rhei. gutt. xx., Potassæ tartratis ʒss, Aquæ anethi ʒss, Misce. Fat haustus, mane sumendus; or the powder called by the late Sir William Fordyce, his “*Pulvis Antihecticus et Antirachiticus Infantum*,” famed, as he says, “for curing, as if by miracle, the hectic fever and swelled bellies of children.” ℞ Sal. polycrest gr. x. Pulv. rad. rhubarb. gran. iij., iv., v., vj., vel. vij.; Misce pro una dosi, omni mane sumend per 14 dies, vel donec cesserit Febris Hectica, aut tumor abdominis.

If it were necessary to record cases, I might fill pages with their recital, but I shall be satisfied if the general fact is received of the efficacy of digitalis in lymphatic disease, with, or without, the other articles mentioned, as there may be evidence of liver complaint, as well as affection of some other portions of the secretory organs.

But it is a gradual steady influence which I desire to establish in the cases for which I prescribe it, and in these gradually increased doses, it would seem to produce the desired effects on the lymphatic and arterial systems—to depress the one and excite the other.

It may be occasionally combined with opium, as in this formula:

℞ Digitalis pulv. gr. ij., Calomel, Opii. pulv. aa. gr. j., Misce. et divide in chart. viij. quarum j. nocte manequè dand.; or the medicine may be given without the calomel, occasional doses of the *hydrarg. cum creta* being substituted for it, and an aperient exhibited according to circumstances.

I am well aware that the administration of opium to children requires much caution and prudence, but am equally certain that these being employed, it will often, by arresting irritation, prove essentially serviceable. In proof of this I take leave to quote the opinion of my late esteemed friend Dr. John Armstrong, as given in his admirable lectures, page 374.

“Sometimes,” he says, “in children there is a state of extreme general irritation. The arms are tossed about, the breathing is rapid, the pulse small, weak and thready, and the countenance anxious. In this state I have found great benefit from a twelfth part of a grain of opium, or one grain of compound powder of Ipecacuanha, or two drops (and in very young children, one drop) of tincture of opium, or two, three, or four drops of tincture of henbane. It is astonishing how these anodynes relieve irritation. Many children would die but for the exhibition of opium, the effect of which is, that the child falls into

a tranquil sleep, from which it awakens with a pulse reduced in frequency, and sometimes with a desire of food.”

Thus far the gifted Armstrong, than whom a more judicious and accurate observer never entered a sick room, and I am sure, that many of my senior brethren will bear testimony to the correctness of his judgment from cases in their own practice.

Against recording such, I have already stated my objection, but there is a very marked one which flashes at the moment on my memory, and of which I am tempted to give a brief sketch.

I was called, many years since, in consultation to an infant supposed to be dying. On arriving at the house of my patient, the place was, as usual in such circumstances, filled with people, and grief and consternation were depicted on every countenance. I cleared the room, *instantly*, of the weepers and wailers, wringers of hands and eager expectants of a death scene, and then proceeded calmly to inquire of the attendant practitioner, a very young man, the particulars of the case. The child was screaming itself into convulsions with agony, and with its knees drawn up to the abdomen, its thumbs clenched in the palms of the hands—was evidently suffering from severe tormina, and intestinal irritation. I soon learned from my colleague, that the little sufferer had been subjected for some days to a routine, *secundem artem*, course of drastics for worms, with which it was supposed to be infested. Hinting at the necessity of endeavouring to sooth the existing irritation and pain, I quietly suggested the exhibition of one grain doses of Dover’s Powder every three hours, with warm poppy fomentations to the abdomen, and took my leave.

On calling next morning, I found, that after the first powder had been given, the child ceased to cry, and on the exhibition of the second fell into a deep sleep, from which it was not then awake. It awoke soon after, and a little arrow-root, with an occasional dose of castor oil to keep the bowels free, completed the cure. Now, there was nothing of magic in this; nothing new or wonderful in practice. Calomel and Scammony, in large and repeated doses, had done their worst, and the timely administration of a little opium, with a soothing diet, sufficed to remedy the evil they had produced.

Still, I repeat, that we must be extremely cautious in exhibiting this powerful drug to children, as its miserable, and too frequently fatal effects, in “*nursery practice*,” sufficiently testify. We should, in fact, always bear in mind the excellent sentence of Wedel—“*Sacra vitæ anchora est opium, bene, et circumspecte agentibus; cymba autem Charonis in manu imperiti, et seu gladium in manu furiosi.*” But to return from this long digression.

Having given my opinion, and the result of my experience, in the treatment of diseases originating in a depraved condition of the lymphatic system, I beg again to guard my readers against misconception. I do not consider digitalis, or any other drug, to be possessed of a positively specific efficacy—nor that the individual who knows how to graduate its dose and regulate its powers, is furnished with all the knowledge that is demanded in the cases referred to. Science is, after all, but the handmaid to experience; and it is only by seeing disease at the bedside, in all its multiplied varieties of types and symptoms, that the confidence and skill can be obtained, which enables the practical physician to prescribe his remedies with something like an assurance of a curative result. I merely assert, then, that, in my hands, the digitalis purpurea has been of the most essential service towards materially aiding the remedial management of those wasting disorders which arise from a faulty assimilation, and are proceeding to a formidable and fatal issue.

Montreal, 27th February, 1848.

ART. XLV.—CHLOROFORM IN MIDWIFERY.

By JAMES B. JOHNSTON, M.D., Sherbrooke, C. E.

The provincial press has of late teemed with cases of the application of chloroform in surgical operations, but as yet few have been reported in Canada of its employment in obstetric practice. Having made use of this new anæsthetic agent in several cases of parturition with marked success, I am induced to detail the particulars of some of them.

The first case in which I employed the chloroform was that of a young lady, a *primipara*, whose labour was very tedious and severe, the pains in the back being most agonising. As soon as the os uteri was dilated to the size of a crown piece, at her urgent request, I caused her to inhale about forty-five drops of chloroform, applied on a piece of flannel, (as having less tendency to spread,) pinned in the hollow of a cone, formed by rolling up a stiff napkin. On this being applied over the mouth and nostrils, in a minute or two she fell into a sound snoring sleep which lasted about ten minutes, the uterine contractions continuing, meanwhile, as regularly as before, though, perhaps, not lasting so long. After the first effect of the application wore off, the patient expressed herself much soothed and relieved, particularly of the severe aching pain in the back, in the interval between the regular pains, which is so distressing. In about an hour I administered a similar quantity with the same good effect, and continued to repeat it at somewhat longer intervals, as I found when I first opened the phial of chloroform which I had

brought with me, that it was nearly half empty, so that instead of containing half an ounce, it did not hold more than two drachms, the rest having evaporated. I regretted much the scanty supply of the article, as I am certain I could have spared this patient, by its means, the most of her sufferings. As it was, she got over upwards of four hours of her labour without experiencing any pain to signify.

The second case in which I made use of chloroform in parturition, occurred the day after the first. The patient was a lady who had not borne children for a number of years, and who dreaded her confinement extremely. She was quite hysterical when I first saw her; the liquor amnii having been discharged some hours previously, and the mouth of the uterus well dilated, though, as yet, she had had scarcely any pains, a circumstance which I attributed to the state of nervous fear in which she was. I at once caused her to inhale about sixty drops of chloroform, with the happiest results. She slept soundly for some minutes; expressed herself quieted and soothed; lost her nervous feelings, and the pains came on regularly. I gave this patient five or six times the chloroform to inhale, and her labour was accomplished in about seven hours, with very little actual suffering. The labour pains, I do not think, were at all retarded in this case by the anæsthetic agent; on the contrary, I think the delivery was more speedily accomplished, by its soothing the patient, and removing all her dread of the result; and, therefore, I should say that chloroform was particularly well adapted for cases like the present. It is impossible to say what quantity of chloroform is actually inhaled into the lungs, unless a metal or glass inhaler is employed. In the case of the patient last mentioned, I expended in all about three drachms.

The third instance in which I used this new agent for alleviating the pains of childbirth, was in the case of a lady confined on the 15th of last month, and for whom, more especially, I had provided myself with chloroform as soon as I learned that it was manufactured in Montreal. She is somewhat advanced in life, being upwards of forty, and has had a large family, with each of whom she had had extremely painful, and sometimes difficult labours. I have attended her in her last three accouchements, which were very tedious and severe; indeed, at her last confinement, upwards of two years ago, I removed the child with the forceps, the face presenting to the pubis. As soon as I entered her room, on the present occasion, she begged of me most piteously to give her the chloroform, saying that she never yet experienced such agony as she was then enduring. She would barely allow me time for the

necessary examination, so urgent was she to be relieved from suffering. Having satisfied myself of the natural position of the child, the pains being strong, and the os uteri well dilated, I gave her at least a tea-spoon full of chloroform on the napkin to inhale. She was in a few seconds in a deep and tranquil sleep, while the uterus was in a state of almost constant strong contraction. From this time she never spoke, except when the effects of the application were wearing off she would indicate with her hand to have her back supported by the nurse, and to cry out, "More, more, give me more," meaning her desire for more chloroform. The labour steadily advanced; I repeated the chloroform four times, increasing the quantity when the head came to press on the perineum. This patient was perfectly unconscious of the birth of her child, and stated afterwards that the first she knew of it was hearing some one in the room say, "What a very fine little girl it is!" This was several minutes after the birth. The quantity of chloroform used in this case was about five drachms. The placenta was expelled almost without pain shortly afterwards. There was no hemorrhage either in this or in the other cases I have reported: neither did ill effects of any kind follow in any of them, such as headache, drowsiness, stupor, or undue excitement; in fact, all the effects of chloroform, as far as I have seen, appear to cease in a very few minutes from its application, say from five to ten or fifteen minutes, except its soothing and tranquillising effects, which remain some time longer. All these cases made very good recoveries; in fact, I should be disposed to say that, *cæteris paribus*, recovery after accouchment was more rapid in cases where this agent was used. I have likewise employed chloroform with great benefit in a case of very distressing sickness at the stomach in early pregnancy, where the nausea and retching was not confined to the morning, but continued all day, so as to prevent the person from taking any nourishment for days together. After inhaling the chloroform in the morning, the patient would generally get some tranquil sleep, after which the stomach would be quiet for the remainder of the day, so that food could be taken and retained.

In conclusion, I would beg to quote a few lines on this subject from Professor Simpson, of Edinburgh, the distinguished physician to whom the world is indebted for the introduction of chloroform as a means of removing pain, and more particularly that of child-birth. He says: "I have employed it (chloroform), with few and rare exceptions, in every case of labor that I have attended, and with the most delightful results; and I

have no doubt whatever, that, some years hence, the practice will be general. Obstetricians may oppose it, but I believe our patients themselves will force the use of it upon the profession. I have never had the pleasure of watching over a series of better and more rapid recoveries; nor once witnessed any disagreeable result follow either to mother or child; whilst I have now seen an immense amount of maternal pain and agony saved by its employment. And I most conscientiously believe, that the proud mission of the physician is distinctly twofold, namely, to alleviate human suffering, as well as to preserve human life."

Sherbrooke, C. E., March 8, 1848.

ART. XLVI.—CHLOROFORM AT THE MARINE HOSPITAL.

By J. MARTIN, Apothecary, Quebec Marine Hospital.

At present, while the use of the chloroform as an anæsthetic agent is exciting so much attention, perhaps the following cases may be deemed worthy of insertion in your journal:—

Francis McNamara, aged 18, an emigrant of the last season, was admitted into the Marine Hospital on the 21st January, for the purpose of having the great toe removed. On the 3rd instant, the operation was performed, in the presence of the physicians of the Hospital and several other medical gentlemen. When placed on the table, one drachm of the chloroform, sprinkled on a piece of lint, was inserted in a funnel, made of thin sheet lead, and applied over the nose and mouth. One minute and a half having elapsed without any perceptible effect being produced, one drachm more of chloroform was sprinkled on the lint, and the funnel again applied. In forty seconds insensibility was produced, when the toe was removed at its articulation, with the metatarsal bone. During the operation the patient evinced no pain, and was not aware of the toe having been removed until after he had been returned to his bed, which was in another flat of the building.

Immediately afterwards, Denis O'Hara, aged 16, was placed on the table for the purpose of having his great toe removed. Two drachms of the chloroform on lint were used, as in the preceding case. Insensibility was produced in less than a minute, when the toe was removed at its articulation, with the metatarsal bone. He evinced no pain during the operation. The effect of the chloroform, however, passed off more rapidly than in McNamara's case, and was succeeded by crying and some nervous agitation. He declared he felt no pain, did not know why he was crying, and

was only satisfied that the toe had been removed when it was shewn to him.

Adam Belté, a French sailor, was admitted into the Marine Hospital, with both feet frozen. He was placed on the table for the purpose of having both legs removed, just below the knee. Lint, saturated with two drachms of chloroform, was applied to the nose and mouth, by means of the funnel. Insensibility was immediately produced, accompanied by considerable muscular spasm, which continued, and rendered it difficult to steady the legs. Amputation of both legs was performed simultaneously, by Drs. Douglas and Sewell, which occupied four minutes, including the use of the chloroform. Sensibility returned while inserting a suture needle; he looked up and observed, that, "les aiguilles sont dures." When fully restored, he only remembered the application of the chloroform and his desire to remove it, from a sense of choking. In this case the use of the chloroform, besides causing entire insensibility to pain, induced a state closely resembling epilepsy.

Since these operations, the patients have done well, and no injurious effects on the health have been observed.

Marine Hospital, February 20, 1848.

ART. XLVII.—CASES OF CHLOROFORM.

By E. D. WORTHINGTON, M.D., Sherbrooke.

Will you allow me to report in your journal three cases in which I recently used the new anæsthetic agent, chloroform, about four drachms of which were kindly presented to me by my friend, Mr. S. J. Lyman, of Montreal.

On the 24th January, I saw an old lady, aged 70, who had fallen upon the right hip about twelve days before. Wishing to satisfy myself as to the precise nature of the injury, I determined to use the chloroform, as the hip was extremely painful, somewhat swollen, and very much discoloured—results partly of the accident, and partly of attempts to reduce the "dislocation"—which, it is needless to say, was fracture of the neck of the femur. About a drachm of the fluid was poured on a folded handkerchief and placed over the mouth, the nostrils being compressed. The case was only partially successful, owing to involuntary resistance on the part of the patient, who wished to inhale, yet dreaded the result; enough, however, was seen to convince, that when fairly administered, total insensibility to pain would be produced. The patient felt some pain, yet not nearly so much as if the examination had been made without the use of the chloroform.

The second case occurred on the 25th, and was that of a child, having a tumour upon the right hand. About twenty drops of chloroform were poured on a small piece of sponge, and held to the mouth, a folded handkerchief covering both mouth and nose. The effect was immediate, and a few drops poured on the sponge kept it up. After the tumour was removed, and the wound dressed, a clean napkin was thrown over the hand, and on returning to consciousness, the child expressed ignorance of every thing connected with the operation.

The third case was one of premature labour, being only a few days over seven months, of utero-gestation. The child was small, and presenting naturally. The pains, at first slight, increased in intensity as the head descended, and became doubly severe from the unyielding nature of the soft parts, and very small size of the os-externum. Having but a small quantity of chloroform, I delayed employing it until the head was well down and resting on the perinæum, and I felt convinced, from the progress during each pain, that I had enough to last till the labour terminated. A sponge and handkerchief, as in the second case, were used; the effect was immediate, and a single drop on the sponge every two minutes sufficed to keep up the influence. The contractions of the uterus came on as frequently and as effectually as at other times, each pain being accompanied by a holding of the breath, as in bearing down, and a slight moan. The placenta followed immediately. The child, which had been dead for some time, was placed out of sight, the bed made tidy, and on the effect passing off, with the appearance of after pain, the woman exclaimed, "Oh dear me! how much longer am I to be sick, doctor?" She could hardly be made to believe the labour over, and said, after two full inspirations, she was wholly free from pain, yet had an indistinct conception of what was passing around her.

I am satisfied that a piece of sponge an inch square, is infinitely preferable to a handkerchief to inhale from, as the latter wastes a good deal of the fluid, and affords a greater surface for its evaporation, still it answers the purpose of fixing the sponge, and confining the respiration through it. I observed no redness or irritation of the lips. A funnel-shaped instrument, of some soft material, capable of being adapted to all forms of faces, with a place to fix a small piece of sponge at the apex, which might have a bend upwards, so that fresh supplies of chloroform may be poured in on the sponge where long continued application is necessary, would perhaps be the best form of inhaler. Chloroform is, beyond a doubt, preferable

to ether, being cheaper and more easy in its application; to the physician, more agreeable, certain in its effects, less exciting, and followed by less unpleasantness to the patient. The ether I used in a few cases of amputation below and above the knee, and the drawing of a few teeth, successfully; and in another without either success or satisfaction, it being a striking case of the bad effects of ether on some constitutions. The disease was caries of the tibia, near its head, requiring the removal of the bone; to some extent I tried the ether the day before the operation, assisted by Mr. Brooks, my student. The effect was precisely similar to that of the nitrous oxide; forgetting his sore leg, the man wanted to fight; we held his arms, when he kicked, stamped, and swore most lustily; and being unable to liberate his arms, punched me in the side with his elbow, for a long five minutes, so violently as to make my ribs ache for a week afterwards. I had to operate next day without the aid of ether, as two attempts to administer it were followed by a disposition to fight. I may be excused if this case has lessened very considerably my admiration for ether, and led me to prefer chloroform, as being more agreeable to doctor as well as patient.

Sherbrooke, February 10, 1848.

PRACTICE OF MEDICINE AND PATHOLOGY.

Fatal effects of the Vapour of Chloroform.—We are this week, by the kindness of a correspondent in the North, able to give a more complete and accurate report of the case of poisoning by the vapour of chloroform, than any which has yet appeared in the medical and daily journals. As it is the first well marked instance of death from the cause, which has been published, it is desirable that all the facts connected with the case should be put on record; and this we are enabled to do by the fulness of the report. It is not often that we meet with a coroner's inquest conducted in so satisfactory a manner. The investigation is highly creditable to all the parties concerned. The condition of the patient, the dose, the symptoms, and the post mortem appearances, are detailed with such clearness, and the cause of death is so unequivocally traced to the agent employed, that every medical practitioner, in the habit of using chloroform, will not fail to profit by the perusal of this report.

It appears from the candid statement made by Dr. Meggison, that not more than a tea-spoonful of the liquid was employed*—a very common dose, and certainly not an undue quantity. It was applied on a warm cloth, held to the mouth and nostrils; in about half a minute there was rigidity of the muscles of the arm, with quick respiration, but no stertor. The lips then became suddenly blanched, and the patient appeared to be in an epileptic fit. Cold affusion and stimulants were employed,—a vein in the arm and jugular were opened, but no blood flowed,—in fact every attempt was made to resuscitate the female but without effect, and in a minute she ceased to breathe.

The time that had elapsed from the first inhalation of the chloroform to her death could not have been more than three minutes. Dr. Meggison states in a letter that "the whole process of inhalation, operation, bleeding and death, could not have occupied two

minutes." This rapidly fatal action of chloroform vapour cannot be referred to the quantity used,—to the youth of the patient, for younger subjects have respired it without danger,—or to the time during which it was employed, for the patient was dead in two minutes—whereas in other cases, persons have been kept under its influence in an unconscious state for twenty-five minutes and even longer.

That it was the cause of death was evident, not merely from the symptoms, but the appearances found in the body. There was great congestion of the lungs:—"the pulmonary tissue was filled with bloody froth, which was also found in the interior of the bronchi, mixed with mucus. * * * On examining the larynx and trachea, the epiglottis was observed to be reddened at the summit, and of a vermilion hue. These are precisely such effects as might have been anticipated, from the experiments made by Dr. Glover, with liquid chloroform more than five years ago. There is great reason to believe that what takes place in the lungs, occurs throughout the whole body, i. e., that there is under the influence of this poisonous vapour, a general enlargement and distension of the capillary vessels. They circulate more blood, and the blood passes of a red colour, through vessels which were before invisible. To this we may ascribe the irjection of the conjunctiva, and the increase in the secretions—as of tears from the eyes, and of salivary glands. In the same way it is not improbable that the capillaries of the brain become preternaturally congested; and a species of apoplexy is produced, under which the patient sinks. In this instance we are informed that the brain externally and internally was more congested than usual; and the ventricles contained rather more than the usual quantity of serum. Sir John Fife's report shews that the stomach, liver, kidneys, and spleen, were more congested than natural, and, in short, the inspection appears to us to bear out the view above expressed, that this poisonous vapour tends to cause a preternatural distension of the capillary system throughout the whole of the body. A turgid state of the capillaries may perhaps be regarded as a common effect of the narcotic poison.*

With this view of the action of chloroform, we cannot quite agree with the correctness of the verdict on this occasion. The deceased died as much from congestion of the brain as of the lungs;—the symptoms preceding death were those indicative of a decided action on the nervous system. In short the deceased was poisoned by the narcotic vapour.

Two views may be taken of the cause of the fatal operation of chloroform on this occasion—1, that it was due to some peculiarity of constitution in the female not indicated by her previous condition,—2, that admitting the existence of a latent susceptibility, she may have breathed it too rapidly, and in a form too highly concentrated. That this agent even in small doses is capable of producing on certain constitutions many alarming symptoms, is evident from several communications which have been published.

In a case recently communicated by Mr. Stewart, only half a drachm in vapour produced violent convulsions, which lasted ten minutes; and numerous other examples might be quoted of the existence of idiosyncrasy in certain individuals, to the effects of this agent. These facts teach caution, and show that trials should be made in small quantities before we resort to its employment in full doses. A practitioner must feel his way; for as in the fatal case now under consideration, it is impossible to predict, *a priori*, whether such an idiosyncrasy as to lead to fatal consequences, does or does not exist in a particular individual.

The other view of the question is of great practical importance, and one which requires consideration in the administration of chloroform vapour. The vapour acts much more rapidly than ether; but as Dr. Snow observes, this is not an unalloyed advantage. In his opinion, it is desirable not to produce a full degree of chirological insensibility in a shorter period than two minutes. This precaution is necessary, not only to afford an opportunity for watching its effects, but also on account of the accumulative

* Mr. Sibson, of Nottingham, observed on dipping the limb of a frog into a watery infusion of opium, that all the capillaries of the limb were soon injected with blood. The effect of the vapour of prussic acid on the capillaries of the conjunctiva has been long known, and Mr. Nunneley, of Leeds, observed in his experiments with this poison on animals, that turgescence of the capillary system was one of the well-marked effects produced by it. These observations are confirmed by the more recent experiments of Mr. T. Waksley, Jun.,

* The report says about a tea-spoonful. It is not stated that the quantity was measured, but it is always desirable that a measure should be used,

properties which chloroform, like other narcotic vapours possesses—a fact which has hitherto received but little attention. He has observed that the effect of the vapour sometimes increases for twenty seconds after the inhalation is discontinued; and he thinks it desirable to take six times this period, or two minutes, for producing complete insensibility, in order to avoid danger. When the patient breathed deeply, he diluted the vapour still further with external air. Now the question is, whether, in this case, the deceased did not receive the vapour in too concentrated a form, and too rapidly; for she was, it appears, dead at the time at which, according to Dr. Snow, the degree of insensibility proper for a surgical operation should be produced. We put this question rather for the consideration of those who are in the habit of frequently employing chloroform, than with the least idea of imputing blame to Dr. Mcgigson for his mode of using it on this unfortunate occasion. We believe many practitioners would have employed it as he did: it is a new agent, and we are perhaps hardly yet aware of all the circumstances which are required to be observed for its safe administration in all cases. We know that the concentrated vapour is a powerful poison: it extinguishes burning bodies, and kills animals with great rapidity. M. Gruby found that rabbits and dogs died suddenly in from one to four minutes, from a dose of forty-six to sixty grains, when the vapour was breathed uninterruptedly; and, in reference to these results, we suggested, that the experience of Dr. Snow and others has fully confirmed, that the inhalation of chloroform vapour should be in all cases occasionally interrupted. This we consider to be even of greater importance than the actual quantity administered; for animals have been kept insensible for hours, and have finally recovered, when they were occasionally permitted to breathe air. There is another circumstance pointed out by Dr. Snow, which deserves attention,—the quantity of vapour breathed when the liquid is placed on a warm handkerchief is liable to great uncertainty. The degree to which it is diluted with air can never be known. Operators, it is true, contrive to avoid any ill effects from this mode of administration, by not applying the handkerchief too soon to the nostrils and mouth, and by occasionally withdrawing it. A man experienced in its use may thus avoid any risk of danger; still, considering the serious effects which have been observed to follow this mode of administering the vapour, it appears on the whole advisable to employ an apparatus as suggested by Dr. Snow, and if possible, to regulate the temperature for its evolution.

On the whole, this instance of the fatal operation of chloroform vapour affords no justification for laying aside the use of this agent: it proves, however, to our minds satisfactorily, that one of its supposed advantages over ether, *i. e.*, of producing insensibility *more rapidly*, is a positive disadvantage. It would, we think, be advisable in any future case not to allow the full effect requisite for an operation to take place in less than two minutes. The risk incurred by hurrying the production of the anæsthetic stage is too great, compared with the trifling inconvenience of delaying for a few minutes the commencement of the operation.—*London Medical Gazette*.

Death of a Boy from Chloroform.—The following instance of death from the improper use of chloroform occurred at Aberdeen on the 8th inst. A lad about 17 years of age, an apprentice to a druggist in the town, has been in the habit of inhaling chloroform almost daily for some time, for the sake of the excitement and pleasurable feelings he experienced from its use. He was observed "staggering about the shop all the morning" as if intoxicated, which was attributed to frequent inhalations of small quantities of chloroform by his companions—but this is not certain. About noon to-day, while there was no person in the shop with him but a boy about 12 years of age, he poured a considerable quantity on a towel and applied it to his face. At this time he was standing by the counter and leaning towards it, so that when insensibility was produced he appears to have fallen forward with his face on the towel with the chloroform. The boy who was with him in the shop at the time, says that he remained in this position for about ten minutes, he being afraid to disturb him, as he always became very violent when any person touched him while he was under the influence of chloroform on former occasions. When raised, he was found apparently lifeless, and medical men were sent for in various directions. In about five minutes (fifteen minutes after he began to inhale the chloroform) Dr.

Jamieson saw him, and found him pulseless—the doctor not being able either to feel or hear the beating of the heart—but the surface quite warm, and the lips very livid. On opening a vein in the arm, a few drops of blood only escaped. Dr. J. immediately introduced a pipe into the trachea from the mouth, and kept up the respiration for 15 or 20 minutes, without being able to perceive the slightest signs of life. Besides these means, the application of strong liquor ammonia to the nostrils, &c., were had recourse to. Dr. Keith arriving almost immediately after Dr. J. had desisted from the use of the artificial respiration, it was deemed advisable to keep it up still longer. An opening was consequently made into the wind-pipe through which a tube was introduced, and in this way the inflation of the lungs was kept up for more than an hour without the slightest effect. Four or five medical men having arrived soon after Dr. Keith, all assisted in keeping up the respiration, and every other suggestion which was likely to be useful under the circumstances was attended to, but without effect. After the most careful inquiries of an intelligent young man belonging to the same shop, and who saw the chloroform bottle shortly before 12 o'clock, but who was not present at the time of its fatal inhalation, it appears that the quantity poured on the towel "could not have exceeded 3 drs. or $\frac{1}{2}$ oz." I suspect no great faith can be placed on this, however, although the person affirms that "he hardly missed it from the bottle." The bottle is large, having a diameter of about four inches. It appears that the deceased was in the habit of inhaling the chloroform so frequently that the bottle had to be hid, but that he discovered it this morning. The liquid appears to be less pure than that manufactured in Edinburgh.—*Scotsman*.

Two views may be taken of the cause of death in this instance: 1,—either that the deceased died from an overdose of chloroform vapour, or 2,—that being stupefied by the vapour, he fell forward on the cloth, and was asphyxiated, in consequence of the cloth preventing respiration. In our opinion it appears more probable that he was poisoned by chloroform vapour, which he must have breathed until respiration ceased. Dr. Jamieson, to whom we are indebted for an account of the case, has promised to send us a report of the *post mortem* examination.—*London Medical Gazette*.

Chloroform in Asthma.—Mr. Chandler has tried this remedy in the following instances:—

The patient, a lady, aged fifty-six, having had the prevailing influenza, for which leeches had been applied to the chest, was seized with her old complaint,—the pain, exceedingly acute, referred to the chest and epigastrium, darting through the body to the back. A free inspiration could not be taken, nor the recumbent posture for a moment endured. At nine o'clock in the morning of the 6th, to half-past two o'clock on the 7th, the hours passed with the patient sitting erect in bed, almost gasping for breath, and uttering a low moaning cry, with every now and then loud shrieks from the sense of constriction on the stomach becoming more acute. Having a fortnight previous to this taken sixteen ounces of blood from her, I was very reluctant to bleed again, and resolved to give the chloroform a trial. I accordingly poured half a drachm on a sponge, hollowed to fit the mouth and nostrils, and held it at first close to, but not touching, the face. In less than half a minute she became excited, waving the arms about, and uttering incoherent expressions, accompanied with loud hysterical laughter; her prevailing idea seemed to be, that she was "riding on a moonbeam." I then placed the sponge in contact with the face, when the limbs gradually relaxed, the arms drooping on the bed, quivering of the eyelids and twitching of muscles of the face took place, and she fell back on the pillow, drawing deep and prolonged inspirations, between each of which, perhaps, eight could be counted. I now withdrew the sponge, opening the curtains to admit air. Respiration gradually became more regular, and she lay without motion, the body well thrown back on the bed, not the slightest vestige of spasm remaining. This state continued until four o'clock, the patient apparently half sleeping, conscious of what was passing in the room, when she sat up and took some food, describing her sensations as having been exceedingly pleasurable. Shortly afterwards she enjoyed a quiet sleep of some hours' duration, and the following morning she was quite quiet, no return of spasm, and no ill effect from inhalation: she is now comparatively well. I tried the vapour

of sulphuric ether in this case, some time ago, not only without success, but with much increase of the sufferings of the patient.—*Medical Gazette.*

On the use of Chloroform in France.—In our number for Feb., 11th, p. 258 we furnished an account of the chief observations recently made in France on the use of Chloroform; and we now offer an analysis of several other communications on the same subject, which have since been made, or presented, by members of the Parisian Academy.

The first of these communications contains the results of experiments performed on animals by M.M. Girardin and Verrier, (*Comptes Rendus*, December 27th, 1847, p. 964.) In one of these experiments, pieces of sponge containing about 15 grammes of chloroform were placed in the nostrils of a horse, in such a manner as to allow free access of air during respiration. In two minutes the animal tottered on his legs, but retained sensation, and shortly recovered. A fresh quantity of Chloroform, amounting also to about 15 grammes, was then employed, and insensibility was thereby eventually induced, but not until after seventeen minutes. The pulse remained quiet and regular, the respiration natural. The most painful operations were performed without the slightest appearance of consciousness. One of the carotid arteries was kept exposed during the experiment, but at no period could there be detected any change in the character of the contained blood. In four or five minutes the horse recovered, and commenced eating.

The manifest inferiority of ether as an anæsthetic agent was well illustrated in another experiment. Sponges soaked with about 30 grammes of ether were inserted, as in the last experiment, into the nostrils of a young colt. After the consumption of this quantity the supply of ether was continually renewed until 360 grammes were consumed, and the inhalation had continued for three quarters of an hour. But during the whole of this time no change in the animal ensued beyond a slight variation in the pulse, and some dilatation of the pupils; sensibility continued perfect; and there was no alteration in the characters of the arterial blood.

Another set of experiments were performed for the purpose of ascertaining the comparative effects of chloroform and ether, when inhaled as vapours with a large quantity of air, and of the same agents when introduced in the liquid state into the circulation. In the experiments with the vapour of these fluids, the animals were confined in a large wooden box, perforated with apertures, to allow of the free access of air, while the vapour was introduced through a table communicating with a vessel filled with the fluid, and immersed in a sandbath. A cat introduced into this apparatus, and subjected to the vapour of ether, in three minutes became attacked with sneezings: in about eight minutes it fell down, and became convulsed; and in eleven minutes was completely insensible. On removing it from the box, and cutting its ears, clear bright blood flowed from them. The insensibility lasted for four minutes and a half. The animal gradually recovered, but continued apparently intoxicated, and unable to stand for a short time afterwards. About 40 grammes of ether were employed. A dog similarly experimented upon with about 30 grammes of ether became affected and fell down comatose in less than two minutes. On being withdrawn from the apparatus, it recovered completely in four minutes. Blood obtained from wounds made during the continuance of the insensibility had all the characters of ordinary arterial blood.

In one of the experiments performed with the view of ascertaining the effects of ether when introduced directly into the blood, 15 grammes of this fluid was introduced into the jugular vein of a horse. In 30 seconds the animal became dizzy, tottered, and then fell down. In one minute sensation was almost suspended, scarcely any signs of pain being given out on dividing the large planter nerves. A

strong odour of ether was exhaled with the breath. The capillaries contained perfectly bright oxygenated blood. Sensibility gradually returned, and the animal recovered in about six minutes. In an hour afterwards other 30 grammes of ether was introduced into the jugular vein of the same horse. The preceding phenomena recurred with greater rapidity than before, and the insensibility was complete, and lasted for ten minutes. During the whole of this time the arterial blood underwent no apparent change. In another horse five grammes of chloroform were introduced into the jugular vein: in fifteen minutes the animal appeared intoxicated, and staggered, having a vacant look, and the pupils considerably dilated. This condition lasted for about a minute, when the animal recovered. In a quarter of an hour afterwards ten grammes of chloroform were introduced into the jugular of the same horse. In fifteen seconds the same phenomena occurred as before, and the animal now fell down. It moaned, was convulsed, and in one minute anæsthesia was complete; no change was observed in the arterial blood. The state of coma continued for about twelve minutes; then the animal gradually recovered, and began to eat.

From the results of their experiments, M.M. Girardin and Verrier deduced that the vapour of ether and chloroform, when they are breathed with a due admixture of atmospheric air, do not act on the respiratory apparatus at all, but only on the nervous centres. They deduce also from the three last experiments, that ether and chloroform produce the same effects on the system when injected into the circulatory system as when respired in the form of vapour; a much less quantity being required in the former than in the latter cases. When the fluids are introduced into the blood the respiratory function is uninterfered with, nevertheless insensibility is manifested in the same manner as during inhalation, and the arterial blood undergoes no perceptible alteration. In the opinion of M.M. Girardin and Verrier, ether and chloroform, therefore, exert a special and direct action upon the organs of sensation, and do not act after the manner of irrespirable gases. If asphyxia ever supervenes, it is only in consequence of deranged nervous action. Cases in which a dark colour of the arterial blood has been observed are evidently those in which the inhalation has been continued after the production of insensibility, and in which asphyxia has been induced by an excess of the agent employed, or by a want of proper respirable air.

Several other observers, as well as M.M. Girardin and Verrier, having doubted the correctness of M. Amussat's opinion, that the arterial blood undergoes any alteration in colour during the inhalation of the vapours of ether and of chloroform, M. Amussat has given an account of the process which he adopts in his experiments. Previous to inhalation he exposes the blood-vessels and nerves at the upper part of the thigh, notices the difference in colour between the arterial and venous blood, as perceived through the walls of the vessels, and examines the colour of the arterial blood by opening a small arterial branch near the knee, which he then closes by torsion. During inhalation he states that a gradual change in hue of arterial blood, as seen through the coats of the arteries to that of the venous blood, may be observed; and when inhalation is carried so far that irritation of the nerves is followed by no muscular contractions, the colour of the arteries and veins is exactly the same, and blood procured from the former has the same dark appearance as that procured from the latter. On suspending the inhalation, the arteries speedily resume their characteristic and distinctive appearance. Large animals, such as dogs, should be employed in this experiment; not frogs, pigeons, or rabbits, whose blood-vessels are too small for the purpose.

That a deep colour is induced in arterial blood has also been maintained again by M. Blanchet. He states, that after two minutes' inhalation of chloroform, the change in colour

is perceived; and that its natural tint is speedily resumed when atmospheric air, instead of Chloroform, is breathed; still more speedily if oxygen gas be respired. M. Blanchet remarks also that he has lately employed chloroform with success in a case of recent painful staphyloma of the iris, which had resisted other methods of treatment. After the inhalation of Chloroform the pupil dilated, and the pain subsided. He suggests the employment of this agent in case of iritis, in which ordinary remedies do not succeed in preventing the occlusion of the pupil.

M. Belon suggests the use of ether and chloroform in the treatment of some nervous affections hitherto regarded as incurable; especially epilepsy.—*London Medical Gazette.*

External Use of Chloroform.—In a single instance I have made use of the chloroform externally, and with satisfactory results. The particulars of the case I will relate.

Mr. W., of this place, while harvesting ice, on the 16th instant, accidentally plunged the hook with which he was hauling the blocks, into the fleshy part of the fore-arm, about midway from the wrist to the elbow, and over the radius. The wound bled profusely, until he applied the other hand to it, when there immediately occurred considerable infiltration into the cellular tissue, so that by the time he reached my office, which was within three minutes' walk, there was much tumefaction. The radial nerve seemed to be in some way implicated, either by the effused blood or the penetrating instrument as he was unable to move the thumb and first two fingers, or allow them to be moved, in consequence of the excruciating pain that the movement occasioned, some two or three inches above the wound. The ring finger was less implicated, and the little finger scarcely at all affected—showing that the ulnar nerve was not encroached upon. This condition of things remained for several days, and in the mean time I directed the use of a stimulating liniment over the painful part, without amendment, until Monday, the 21st, when I suggested to him to call upon me in the evening, and I would try an application of the chloroform. I dropped upon his arm about a drachm of the chloroform, which evaporated very speedily without any manifest effect. I was then obliged to be absent for about an hour. Upon my return I found him waiting for me at my office, to show me the surprising effects of the remedy. He had recovered entirely the use of the hand and fingers, and with the exception of a slight inconvenience over the lower part of the radius, he could perform every motion without the least pain. I applied the chloroform to this part, by means of a piece of surgeon's lint moistened, over which I applied oiled silk to prevent evaporation. Perhaps a piece of bladder would have answered this purpose better. The next morning, and to this time, all traces of this painful implication of the nerve have been removed, and there only remains a slight weakness of the limb—the common result of a wound, probably, rather than the effect of the application of the chloroform.

The idea of its external application was first suggested to me by the numbing effect it produced upon the lips of a lady, to whom I gave it upon a sponge, without an inhaler, lasting twenty-four hours. Since using it in the case of Mr. W., I have met with the suggestion of Dr. Warren in the appendix to the re-print of Prof. Simpson's pamphlet, concerning its external use "in the way of friction in rheumatic, neuralgic, and other local pains."—*B. H. T. in Boston Medical and Surgical Journal.*

Proposed Employment of Chloroform in Delirium Tremens.—By A. PRIDEAUX, Liskeard, Cornwall.—In common with most of my professional brethren, I have tested the comparative value of chloroform and ether, and have found that the former bears no comparison as regards the certainty of its operation, the ease of its application, and the effect it leaves. In the generality of cases, I believe it to be perfectly safe, and its action to be far more certain than its predecessor. Judging from the effect of chloroform on the nervous system, I think it may prove a powerful remedial agent, and it deserves a trial in one disease to which I think it particularly applicable, viz., *delirium tremens*. The great object we have in view in this dreadful malady is to procure sleep; if we succeed in this we have done much towards the

cure. We give large doses of opium for this purpose; why not, then, administer the chloroform, which doubtless would have the effect certainly, quicker, and more surely? I have had no case since I first thought of the subject, so that I can say nothing from experience; but it deserves, at all events, a trial, and as it is possible such a case may not present itself to my notice for some little time, I am anxious that the idea should not be lost on that account, but, through the medium of your widely circulated journal, find access to the profession, and have an immediate trial.—*London Medical Gazette.*

Congenital Deficiency of the Gall-Bladder.—Mr. Canton relates the following rare case. In examining the body of a female aged 65, his attention was directed to the circumstance of the trifling exudation of bile upon the neighbouring intestines, and on raising the liver he discovered that the gall-bladder was absent, there being only a small indentation in the liver at its usual position. Suspecting malformation, Mr. Canton searched for the viscus or its remains, but without success; and on making slices of the liver without finding traces of it he was convinced that it was congenitally deficient. The liver was small, the right and left hepatic ducts of their usual diameter, uniting at an obtuse angle just below the transverse fissure to form a ductus choledochus, which was the common hepatic duct, larger than usual and double its ordinary calibre. The lining membrane of this trunk resemble the mucous membrane of the gall-bladder. The cystic artery, vein and nerves, were wanting.

In his comments upon the case, the author remarks upon the fact that the gall-bladder is often deficient in the lower animals, in mammalia, birds and fishes. He also notices the occasional degeneration of the viscus from disease, which might lead to the idea of its absence in consequence of its conversion into fibrous tissue; the mistake is, however, rectified by the presence of the cystic artery and vein. The author further observes, that no specimen should be set down as one of congenital deficiency of the gall-bladder, until careful sections of the liver have been made, to ascertain whether or not it is situated in the substance of the latter viscus, either in a perfect, contracted, or condensed state, in other words, still occupying the position of the early fetal period. Again, the condition of the cystic duct should be noted, and its presence, even in the modified state referred to, would justify the inference that the gall-bladder had at some period been present, though imperfectly developed, and that from imperfection of function had gradually disappeared. That the case under consideration is rare, is acknowledged by Mr. Kiernan, who is justly regarded as a high authority in matters connected with the anatomy of the liver.—*Lancet*, Oct. 16.

The Actual Caustery in Neuralgia.—M. Notta adduces thirteen cases in illustration of the value of this form of counter-irritation. Of these two were instances of intercostal neuralgia, ten of sciatica, one of facial neuralgia. Half the patients were robust, the remainder debilitated and impoverished. All were well-marked instances of neuralgia,—that is to say, there were points painful on pressure, and darting pains along the course of the nerves; these pains were severe, and sleep was more or less disturbed in all the patients. Of the patients labouring under sciatica, six were quite unable to walk, and four only had received any benefit from previous treatment. In all these cases the cauterization was conducted as follows:—The patient being placed in a favourable position, was rendered insensible by ætherization, and the affected part was crossed two, three, or more times, with a thin iron, heated to whiteness, after which it was covered by compresses, dipped in cold water. The caustery produced brownish lines, which the day after became dry and crisp, and eventually disquamated. The subsequent pain was inconsiderable.

In respect of the effects of the cauterization, it may be stated that the most remarkable was the notable relief of the neuralgic pain. In five or six hours the limb could be moved with facility, and the following night was tranquil; in the course of twenty-four or forty-eight hours the darting pains disappeared. Of the thirteen patients, in whom it was tried, ten were perfectly cured, two were much relieved, and in one only was there no improvement.—*Union Médicale*, Oct. 1847.

Treatment of Cerebral Inflammation.—Mr. Solly says, in the treatment of these affections the following principles must be attended to:—1. There is no time to be lost, even minutes are of value. 2. Inflammation of the brain being a depressing disease, general blood-letting is not often admissible. 3. Though this may be attended with benefit at the time, the good derived is seldom permanent. 4. Local blood-letting by leeches and cupping is generally useful, and especially in cases of insomnolence, arising from abnormal action of the brain. 5. In cases of insanity, where opium has failed to produce sleep, leeches and cold applications generally will; and, if they do not, it is strong evidence that the excitement arises from hyperæmia, and not from anæmia, as in that of delirium tremens. 6. Aconite and digitalis are the best sedatives, especially when combined with mercury. 7. When it is advisable to salivate rapidly, raise the cuticle by boiling water, or a similar escharotic, and dress the surface with strong mercurial ointment. 8. Always commence the treatment with a brisk mercurial purgative. 9. Soothe the patient's feelings in every way. 10. Never leave anything that is disagreeable to the patient to be done by a nurse or attendant, such as the application of leeches, &c., but persuade him to have them applied. 11. Never lose your patience in the treatment of a chronic case, or try to hasten the cure by increasing the doses. 12. When it is considered necessary to continue the use of mercury for a lengthened period, combine tonics with it.—*Medical Times.*

Acetate of Lead in Tympanites.—Dr. Badeley, mentions a case of temporary intestinal obstruction with excessive lymphatic distension, in which the best effects followed the exhibition of the acetate of lead. Purgatives had failed to procure an evacuation. Vomiting supervened, with hiccough, and the coils of distended bowels could be felt through the abdomen. Feeling convinced that the symptoms depended upon a loss of tone in the muscular fibres of the alimentary canal, alum was ordered, with turpentine injections, and having failed, three grains of the acetate of lead, with one-sixth of a grain of morphia, were given every four hours. This was soon followed by the expulsion of large quantities of gas, and copious dejections. The hiccough and vomiting declined, and the man was soon convalescent.—*Lancet*, Jan. 8.

Use of Ice in Exhausting Disease.—Some interesting cases are quoted in a recent number of the *Revue Médico-Chirurgicale*, from a French journal, in which ice taken internally seemed to be of great service in reviving powers fast sinking. The writer employs it in very various diseased conditions, providing these manifest the signs of intense debility. The reaction it induces may prove curative in some cases, while in others, in which this is impossible, a marked temporary amelioration of the patient's state occurs. In the cases in question there is great atony and exhaustion, and an extreme aversion to any food whatever, with or without a development of heat. A number of morbid states and organic lesions, having no other points in common, may induce this condition. Iced water does not succeed anything like so well as the administration of the ice in little lumps, which by requiring time for their solution, ensure its gradual introduction. These impart great tone to the system, and revive the inclination for food in a remarkable manner.—*Rev. Méd.-Chir.*, Vol. 2, p. 168.

SURGERY.

Solution of Sulphate of Iron in Prolapsus Ani.—Mr. Vincent states that he has of late had great advantage in employing a solution of sulphate of iron, one grain to the ounce, in prolapsed bowels, and that an operation may often be dispensed with, and the patient cured merely by the use of this remedy. Very lately he has had two cases of the worst sort, one of twenty years' standing, with great protrusion and abundance of bleeding piles, which in three weeks was completely cured. The other came from one of the institutions which offer great pretensions in the treatment of these cases. The patient was very bad, having both internal and external piles, and the bowel descended largely and most readily; he was completely relieved in about a month.—Other cases of a slighter kind have been set to rights in a week. The patient should be kept in bed, so that the bowel may be as

much as possible in repose, and after it is cleansed out, a small quantity of the injection should be daily thrown up, and retained. Balsams are also well adapted to the disease.—*Observations on Surgical Practice*, p. 174.

Death from Chloroform during a Surgical Operation.—On Saturday, the 29th of January, an inquiry was opened at the village of Winlaton, about five miles distant from Newcastle-upon-Tyne, by J. M. Favell, Esq., the coroner of Chester ward, in the county of Durham, to ascertain how, and by what means, Hannah Greener, aged 15, had come to her death.

The deceased was, about three months since, an inmate in the Newcastle infirmary, where (on the 26th of October) she underwent an operation under the influence of ether; and it was on the 29th of January, while undergoing a second operation under the influence of chloroform that she lost her life. The event, as will readily be conceived, produced considerable excitement in the minds of a village population; and the coroner resolved very wisely to make a full and searching inquiry, for the satisfaction of the public, and in justice to the medical practitioner by whom the operation was performed.

A jury having been sworn, and having viewed the body of the deceased.

John Rayne deposed that he was a blacksmith, and lived at Winlaton. His sister married John Greener, the father of the deceased. She came home from her grandfather's about a year ago. Dr. Meggison of Wickham, surgeon, had visited her several times. She was in the infirmary about four months since, to have a toe nail taken off. Dr. Meggison was employed by her father to have another nail taken off—from the great toe of her right foot. Dr. Meggison's assistant performed the operation yesterday (Friday, the 28th ult.) about one o'clock. The persons present were Dr. Meggison, his assistant, and witness. Deceased was seated in a chair by the fire, and Dr. Meggison held a pocket-handkerchief to her mouth and nose; he kept moving it at times, and looked at his watch, and felt the deceased's pulse. The assistant had the instruments all ready to commence. Deceased appeared to be faintly like. Dr. Meggison then told his assistant to take off the nail. Witness held her leg to steady the foot. The assistant took the nail off very quickly. When he was removing it the deceased shook her foot. She did not speak, but moaned after the nail was off. They dashed some water in her face, and her eyes moved. Dr. Meggison put some brandy in her mouth, and there was a rattling in her throat. She did not come to her senses; she appeared in a fainting fit. Dr. Meggison bled her in the right arm; she bled a little,—may be a table spoonful or so. He bled her also in the neck, and about the same quantity came away. She died without ever recovering. She had the nail taken off the large toe of her other foot about four months ago, in the infirmary. Witness had heard that some stuff was given to her at that time to make her insensible.

Mary Greener deposed that she was the wife of John Greener, of Winlaton, banksmen. The deceased was 15 years old; she was not witness's daughter. Dr. Meggison had been attending her for her toe. She was in the infirmary for her toes for nine weeks. Witness brought her out on the Monday before Christmas-day. She had a toe nail taken off in November. She told witness she was made insensible before it was done, and felt no pain. Her father said on Thursday (the 27th ult.) she had better not have that stuff to make her insensible again. Deceased said she would not have the nail taken off without it. All the family were then agreeable, not only that she should have her nail removed, but that she should take the stuff. She was in good health before she went to the infirmary. She fretted in the infirmary, but never complained of ill treatment. She grew thinner while in the infirmary, and also after she came out. She took her victuals better this last month. She had complained of a pain in her chest, and doubled herself up, both in and out of bed; she was never subject to anything of the kind before she went into the infirmary. She suffered much pain in her toes,—in the one from which the nail was removed and in the others. Witness thought the pain was so great as to prevent her thriving. The toe-nails were growing in the flesh, which was much swelled. Witness had poulticed her toes, and rotten flesh came off the one from which the nail was removed.

Dr. T. N. Meggison, Surgeon, being asked by the coroner if there was any statement which he wished to make, said that

Hannah Greener died under his hands on the previous day while under the influence of chloroform vapour, administered for the sake of producing insensibility during the removal of a toe-nail. She was suffering under onychia. She had never complained of pain in the chest to witness. The pain in her toes might cause her to become thinner. Witness seated her in a chair, and put about a teaspoonful of chloroform upon a cloth, and held it to her nose. After she had drawn her breath twice, she pulled witness's hand down. He told her to draw her breath naturally, which she did; and in about half a minute he observed the muscles of the arm become rigid, and her breathing a little quickened, but not stertorous. Witness had one hand on her pulse, which was natural until the muscle became rigid; it then became somewhat weaker, not altered in frequency. Told his assistant, Mr. Lloyd, to begin the operation, which he did, and removed the nail. When the semi-circular incision was made, she gave a struggle or jerk, which witness thought was from the chloroform not having taken sufficient effect. Witness did not apply any more. The eyes were closed at first; witness opened them, and they remained so. Her mouth was open, and the lips and face were blanched. When witness opened the eyes they were congested. He called for water when he observed her face to be blanched, and gave her a mouthful; he also dashed some in her face. It had no effect. He then gave her some brandy, a little of which she swallowed with difficulty. He laid her on the floor, and attempted to bleed her in the arm and jugular, but only obtained about a spoonful of blood. She was dead, he believed, at the time he attempted to bleed her. The last time he felt her pulse was immediately before the face became blanched, and when he observed the jerk. The time that elapsed from the first inhalation of the chloroform to her death could not be more than three minutes. Witness procured the chloroform from Daglish and Ismay, of Newcastle. He had used chloroform from the same place before with good effect and no ill consequences. He did not apply more than a drachm to the deceased—probably less. One of his patients required upwards of half an ounce, at four times, before she became insensible, and she completely recovered afterwards. He had used it to a woman who was very drunk, and would not lie still without it. She had dislocated and fractured her ankle. Two tea-spoonfuls were given, and it had the proper effect. His assistant, Mr. Lloyd, was a duly qualified practitioner, and had been in the habit of using chloroform.

Mr. William Lloyd, Surgeon, expressed his concurrence in what Dr. Meggison had stated.

The inquiry was now adjourned, that a post-mortem examination might be made by Sir John Fife and Dr. Glover, of Newcastle.

On Thursday, at half-past one o'clock, the inquest was resumed. Before the arrival of the medical witnesses, the Coroner stated that he would read a passage from the *Medical Gazette* of December 3, 1847, from which the jury would learn that chloroform was a substance in general use among medical men, and that Dr. Glover, was a peculiarly appropriate witness to be called before them in an inquiry like the present. Mr. Favell proceeded to read part of an editorial article alluding to the prevalent use of chloroform vapour in surgery and midwifery, and its apparent possession of all "those advantages over ether vapour which had been announced by Dr. Simpson."

"While, however," said the *Medical Gazette*, "these facts appear to promise safety in the use of chloroform vapour, the experiments of Dr. Glover on animals tend to show that this agent is not to be regarded as innocuous. He found that it had a tendency to cause congestion of the lungs. His experiments were not performed with the vapour; and the mode of introduction into the system by the lungs may considerably modify the effects."

In the same number of the *Gazette* (Mr. Favell continued to say), there was a letter from Dr. Glover, dated "Newcastle, Nov. 21." That gentleman observed that Professor Simpson, to whom belonged "the sole merit of having proposed chloroform as a substitute for ether in surgical operations,"* spoke, "as if no one had an idea of the physiological properties of this substance before his time;" but in October, 1842, there was published, in the *Edinburgh Medical Journal*, a paper of his (Dr. Glover's), on bromine and its compounds, and the analogies existing between the physiological properties of these bodies and those of the corresponding

compounds of chlorine and iodine; one chapter of which paper was headed "Physiological Properties of the Bromide and Chloride of Olefant Gas, of Bromoform, Chloroform, and Iodoform." This chapter began thus:—

"The only experiment on an animal with any of this class of bodies, is one related by Dr. Cogswell with iodoform, which he terms sesquioxide of carbon, but which we now know to be a compound of three atoms of iodine with one of formyl. The curious results of this experiment led me to investigate this class of bodies, which, from the results of my experiments, appear to form a new class of poisons, and to be possessed of properties not unlikely to be useful in the treatment of disease."

The chapter detailed an extensive series of experiments with these bodies, and especially with chloroform, performed upon animals, and, among other general conclusions, stated the following:—

"The action on the spinal cord is very different from that of strychnia, to which my friend Dr. Cogswell compared it in the case of iodoform. Strychnia destroys the influence of the will over the muscles, but appears to excite the spinal cord, which loses its sensibility under the action of this class of poisons."

Having thus referred to his paper of 1842, Dr. Glover closed his letter to the *Medical Gazette* in these words:—

"When the application of ether and of chloric ether to anæsthetic purposes became known, I remarked to several of my friends that without doubt all the class of bodies on which I had formerly experimented would possess similar properties, but was deterred, from the fear of their formidable power of congesting the lungs, from giving them in practice.

"Either the action of chloroform, when inhaled, must be very different from its action when admitted in other ways, or animals must be more susceptible of it than man. Perhaps habituation to alcohol may protect us somewhat. The use of chloroform, in some habits and cases, must, however, be attended with danger, from its immense power of congesting the lungs." The Coroner, when he had laid aside the *Medical Gazette*, caused the father of the deceased to be called, some one having stated that he had evidence to give.

John Greener was accordingly sworn. He deposed that he was a banksman at Mr. Ramsay's colliery. The deceased, Hannah Greener, was his daughter. There did not seem any thing much to ail her, except in her toes. She said, when she came out of the infirmary, that the doctors gave her ether before they took her nail off, and that they tried three different strengths* before she turned insensible. She said they pricked her with needles or pins before they performed the operation, to try if she felt any pain. She said she felt no pain when the nail was removed. She was bad of both toes at the time, and had suffered from both since. Witness employed Dr. Meggison to attend her; and he and his wife were agreeable to the operation. Deceased wished to have the chloroform. She had complained that the ether made her head bad for two or three days. The night before the second nail was taken off, witness said that she had better suffer a bit of pain for a moment than have her head made bad again for some days with the stuff. She said she would not have the operation performed if they would not let her have it; so they agreed that it should be given to her.

Sir John Fife was now sworn. He stated that he had made a post-mortem examination of the body of Hannah Greener, with Dr. Glover; and they had thought it important to reduce the result to writing. It was as follows:—

The examination was made about 3 o'clock p.m. on Saturday, the 29th of January. The body was that of a well-grown female of about 15 years of age. The development seemed on the whole in tolerable relation to the age. The legs were rather thin; calves not sufficiently fleshy. Breasts tolerably well developed; and although on the whole thin, she was not altogether devoid of fat, as appeared on proceeding to open the body. The body was perfectly free from spots or stains of any kind, except from the marks of the phlebotomy to which she had been subjected, and some light livid stains about the neck. The toes showed the nature of the operations which had been performed. There was simply the ordinary degree of rigidity. Mouth a little open; eyes presented no appearance of congestion. On opening the chest, the lungs were not collapsed. One or two very slight adhesions were encountered on separating them from the walls of the

* It was first used by Mr. Bell. See *Pharmaceutical Journal*, Feb. 1847, p. 357.

* This is an error. Three different instruments were used, but only one specimen of ether.

chest. The external appearance of both lungs, over the whole surface, but especially in the inferior portions, was that of organs in a very high state of congestion. They were mottled with patches of a deep purple, bluish, or scarlet hue. They were everywhere crepitant. Along the outer and interior border of both lungs, particularly of the upper lobe of the left lung, were several emphysematous bubbles of small size. On cutting into the pulmonary tissue, it was found free from tubercles; unless some hard bodies about the roots of the bronchi (enlarged and partially indurated glands) could be called so. The pulmonary tissue was filled with bloody froth, which was also found in the interior of the bronchi, mixed with mucus. There was no appearance of hepatization. On examining the larynx and trachea, the epiglottis was found reddened at the summit, of a vermilion hue. The mucous membrane of the larynx was redder than natural—mottled with vascular patches. The sinuses of the larynx contained a good deal of dark mucus. The œsophagus was healthy. The stomach was distended with food. Some of the veins were more distinct than usual. Digestion had been going on at the time of death. The liver, kidneys, and spleen, were more congested than usual. The heart contained black fluid blood in both its cavities; very little in the left. Its structure, and that of the great vessels near it, quite healthy. The brain, externally and internally, was more congested than usual; and the ventricles contained rather more than the usual quantity of serum.

These (observed Sir John) were the facts revealed by the examination; he now came to matter of opinion—and he gave it as the united opinion of himself and his friend Dr. Glover.

The coroner requested that Sir John would give it as his own opinion: he would take Dr. Glover's separately.

Sir John Fife resumed:—In his opinion, the cause of death was the congestion of the lungs; and this congestion he was compelled to ascribe to the inhalation of chloroform. Of the power of chloroform to occasion congestion, no doubt could be entertained, after the experiments of Dr. Glover, and Mr. T. Wakley, Jun., on animals. There did not seem anything observable in the previous condition of the young woman to have prevented the surgeon from having recourse to chloroform, as a means of allaying pain in one of the most painful operations of surgery. Having now concluded what was written, he had only to say, further, that such was his conviction of the value of chloroform in lessening human suffering, and of the comparatively small amount of danger attending its use, taking into account the number of cases in which it was applicable, that if he was himself under the necessity of submitting to an operation such as the one now under consideration, or to any other operation involving much pain, he would insist upon taking chloroform. He had given it repeatedly, and in much larger quantity than was administered by Dr. Meggison. Ever since the occurrence of this event he had used it; and he should continue to do so, with the fatal result in the present instance staring him in the face. Ever since Dr. Simpson had first applied it in surgery, and made known its virtues in relieving pain, he had been in the habit of using it, and had constantly seen it preventing suffering without leaving any bad consequences behind it; he had never once seen any bad effects from it. There was one remarkable case which he might mention, in which a woman submitted to the removal, by dissection, of a tumour weighing three pounds, and exposing a dissected surface of a foot square. Dr. Glover administered the vapour of chloroform, and his (Sir John's) son dissected a way the tumour. The operation occupied some minutes, during which chloroform was applied in eight times greater quantity than was used by Dr. Meggison. Yet the woman was no worse after the operation than might reasonably be expected, and recovered favourably. He had used chloroform in cases of amputation, in lithotomy, and in other severe operations, and seen, he repeated, no evil effects from it. He attributed the fatal result in this young woman's case to some peculiarity in her constitution—not to be detected before hand—either in the lungs or in the nervous system. He had no hesitation in saying that the same result might have occurred in the hands of the most prudent and skilful surgeon that ever lived. It was necessary that the coroner and jury should be reminded of this fact. Persons would die sometimes from the shock of an operation, and no appearances might present themselves to account for such results; and the same susceptibility which led to a catastrophe of this kind, would be likely to produce the same issue from the use of chloroform. He should certainly not use chloroform in all cases; he had refused to use it that day in a trifling

case. He should think it undesirable to use in trifling cases, where the pain was neither severe nor protracted. In other cases, however, he would not only resort to it, but if the quantity used by Dr. Meggison failed to produce insensibility, he would double it without hesitation. Within the last two months he had performed almost the whole of the more formidable operations of surgery in connection with chloroform, and without any bad consequences.

A Juror.—What is the meaning of congested?

Sir John Fife.—Gorged with blood. The eye is congested when it is said to be "blood-shot." Sometimes the congestion is so extreme as to burst the smaller veins.

Robert Mortimer Glover, M.D., examined by Mr. Favell, deposed that he was a lecturer on *Materia Medica*, and formerly on *Medical Jurisprudence*, in the Newcastle School of Medicine and Surgery. He concurred in the report read by Sir John Fife. The after-treatment of Dr. Meggison for the recovery of the deceased was very proper; it was in accordance with the practice recommended by the highest authorities. He should think that chloroform might be used, perhaps, with greater safety in the larger operations, where there was much loss of blood, than in the smaller ones. He had examined the chloroform used by Dr. Meggison, and found it pure; the bottle bore the name of one of the most respectable manufacturers in London. He should not think chloroform safer than ether. He found from a lecture lately delivered by Professor Brande, that gentleman was of the same opinion as himself. He (Dr. Glover) had thought from the first that the use of chloroform was attended with danger. There was a case recorded in the *Medical Gazette* of Friday, January 28, in which the use of chloroform had been accompanied by formidable symptoms. In the case mentioned by Sir John Fife, of the removal of a tumour, the loss of blood might render the copious application of chloroform less dangerous. After the use of it made by Dr. Simpson, and so generally afterwards by medical practitioners, Dr. Meggison, or any other gentleman, was perfectly justifiable in adopting chloroform. On reading Dr. Simpson's publication on the subject, he (Dr. Glover) had written to him to say that chloroform was not, in his opinion, so harmless an agent as the professor supposed. From the very fact that it was more powerful than ether, he should infer that it was more dangerous. It was in general use, however, all over the kingdom, and also in France; and Dr. Meggison, in using it in the present case, had observed proper precautions—such as feeling the pulse, &c.

Sir John Fife said, in reference to what had fallen from Dr. Glover, that in one of the hospitals in London chloroform had been used in the case of an infant ten months old, where there was no loss of blood, and yet no ill consequences had followed. It was a case in which a needle was passed through a congenital tumour.

Dr. Meggison (who was present at the *post-mortem* examination) expressed his concurrence in the report made by Sir John Fife and Dr. Glover.

The coroner addressed the jury, observing that this was a case of so much importance to the public and the profession, that he had felt called upon to step out of the ordinary course of proceeding, and go beyond the bare requirements of the law. Having briefly stated the law and the facts, Mr. Favell remarked that the jury had enjoyed the advantage of hearing both Sir John Fife and Dr. Glover on the case before them, and would have little difficulty in coming to a right verdict.

The jury retired to another room, and were absent a short time. On their return, the Foreman (Mr. John M'Ewan) said, they were unanimously of opinion that Hannah Greener died from congestion of the lungs, produced by chloroform, and that no blame could be attached to Dr. Meggison or his assistant.

The coroner said, he might now mention, what he had not thought it right to name before, that Dr. Meggison, immediately after the fatal event, informed the police of it, and suggested that it would be necessary to hold an inquest.—*London Medical Gazette*.

Reduction of Dislocation of the Patella.—There is a dislocation of the Patella in which that bone rests in its trochlea, but is turned on its edge; the inner edge is applied to the femur; the outer, of course, standing out at right angles to it; the upper surface faces the other knee, and the articular surface looks outwards. It might, on first consideration be

supposed that a replacement could be readily effected; but practically it is a very formidable undertaking, if the surgeon has not entered into those views I now offer to the profession, in connection with the association under which muscles act. Some years ago I was called suddenly by a surgeon to assist in reducing a dislocation of this sort; for effecting which the medical man had resorted to all the various expedients he could contrive for effecting the purpose. I found the patient to be a gentleman, who some years before had, in the common way, dislocated the patella whilst shooting, and that he had subsequently had the same accident often occur, but now it had become the dislocation of the above kind. The surgeon had exhausted his ingenuity. However, we resumed the series of contrivances with all the powers we could exert of lateral pressure on the bones in all directions; but nothing availed, and it seemed to me as firmly fixed in position as if three or four long screws had been driven through its thickness and bound it most closely to the femur. All this time we were acting on the falsely-received notion of relaxing muscles by merely keeping their attachments as much as possible approximated to each other, and the leg was most carefully kept extended on the thigh.

After a long course of trials in this way, it occurred to me that I might effect some change by giving the bones a sort of shake; for this purpose I slightly bent the leg, and gave a little rotatory motion to the tibia, when the patella quietly returned to its proper situation, as if a charm had released it from its fixed state. The hand of an infant might now have deposited it in its trochlea. The result of the manipulation in this case led to reflections which opened to my view principles very different from those I had formerly held. It offered a forcible example that any muscle disturbed in its arrangement is under great excitement to act. The disturbed arrangement here was the elevation of the centre of action of the extensors above the ordinary position; and, as these muscles, in the straight position of the whole limb, are called upon to support a great proportion of the weight of the body, so, when in that position, they are naturally impelled to exert a vast force; but, in obedience to the associated action of combined muscles, when the leg is bent, and another order of motions in this complicated joint is brought into play, then these extensor muscles immediately relax: they would otherwise, by their action, prevent the rotatory motion of the leg upon its axis. Thus, the moment the leg was bent, the extensors returned into a comparative state of repose, and left the patella quietly to resume its appointed position. Not very long after the occurrence of the above case, I was called one night to the hospital to a similar one. The house-surgeon had adopted all the means of ingenuity and of force, but had not succeeded in reducing it. I bent the leg, and, rotating it in the axis of the tibia, the patella quietly returned, and thus was accomplished the reduction. —*Vincent's Observations on Surgical Practice.*

MIDWIFERY.

Croup with an Affection of the Fauces, or Diphtheritis. By CHARLES WEST, M.D.—In the last lecture we were occupied with the consideration of the management of those cases of croup in which the patient is seen early, and in which his condition warrants the employment of powerful antiphlogistic measures. He may, however, be seen too late for such means to be allowable, or they may have been tried in vain. If antimony cease to vomit, or if it be rejected immediately, and without effort, the fluid thrown up being unmingled with phlegm or false membrane, while the temperature sinks, the lips grow more livid, the pulse more frequent and feeble, and the paroxysms of dyspnoea are undiminished in severity; or if the respiration, though less laborious, be attended with a sibilant instead of a stridulous sound; it is evident that by continuing the medicine we may destroy the patient, but shall fail

to cure the disease. A totally different plan of treatment must at once be adopted, though with but slender hope of success.

An attempt must be made to arouse the child from the state of collapse into which it is sinking, by placing it for a few minutes in a hot mustard bath, and emetics of the sulphate of copper should at once be administered. The sulphate of copper has been considered by some writers to be possessed of a specific influence over croup. I cannot, however, take this view of its action. It has seemed to me to be nothing more than an emetic of great power, and therefore especially applicable in cases where considerable depression exists, and where the stomach has consequently lost much of its irritability. * I am accustomed to give it dissolved in water in quarter or half grain doses every quarter of an hour till free vomiting has been produced, but have never trusted to it alone, in the same way as in an earlier stage of the disease I am used to rely on tartar emetic. I employ it with a two-fold purpose; first, to obtain the stimulant action of an emetic, second, to prevent, if possible, the accumulation of false membrane in the larynx. Hence, if the child seem again sinking into a state of collapse, or if coma appear coming on, or if the dyspnoea become much aggravated, the sulphate of copper may again be employed to induce vomiting. Your main object, however, must now be to bring the system as speedily as possible under the influence of mercury, though the attempt will very likely fail, and the most complete success by no means implies the recovery of your patient. With this view a grain of calomel may be given every hour to a child from two to three years old, unless the existence of profuse diarrhoea should contraindicate its use; while, at the same time, a drachm of strong mercurial ointment may be rubbed into the thighs every two hours. If diarrhoea be present the calomel must be given more sparingly, or even be altogether omitted; but the inunction may be used even more frequently.

In this stage of croup the decoction of senega is a medicine of great value, and may be given in combination with the carbonate of ammonia and tincture of squills every two hours. The pungency of the ammonia is best concealed by sweetening the medicine with treacle or coarse sugar, and mixing it with about a third of milk, and in this form children will seldom refuse it. No other remedy or combination of remedies has appeared to me to be so useful as a stimulant expectorant in the advanced stage of croup or bronchitis. The patient's strength must be supported by beef-tea, and a generally nutritious diet, and even wine may be indicated; though small, indeed, are the hopes that remain when the vital powers have sunk so low as to require its employment.

Much difference of opinion prevails among writers of high repute as to the proper time for employing counter-irritation in cases of croup, and still more as to the part to which this counter-irritation should be applied. I believe that when the disease has been checked by antiphlogistic measures, and the symptoms have lost something of their severity, much good is done by the application of blisters to the upper part of the sternum. But, on the other hand, if croup have reached an advanced stage, unchecked by previous remedies, blisters to the sternum have seemed to me nearly, if not altogether useless; while, from the application of a large blister to the throat, covering the larynx and reaching down nearly to the sternum, I have often observed the paroxysms of dyspnoea to be much alleviated, the respiration rendered far more easy, and expectation for the first time accompany the cough. In any case, if very manifest relief were not observed within six hours, after the abstraction of blood and the administration of antimony, while further depletion did not appear justifiable I should apply a blister to the throat. †

It was to be expected that the probable utility of *bronchotomy* in cases of croup should suggest itself to the earliest observers of the disease. For many years, however, after it was first advocated on theoretical grounds by Dr. Home, the value of the operation

* As illustrative of the utility of emetics as stimulants, in some cases of great exhaustion, the reader may consult some cases by Mr. Higginbottom, in chap. xxviii. of Dr. M. Hall's *Practical Observations and Suggestions in Medicine*. 2nd Series, 8vo. London, 1846.

† This opinion being opposed to that of men such as Dr. Stokes and Mr. Porter, I feel it necessary to appeal in support of it to the authority of Gólis, lib. cit. p. 118, and Albers, *de Tracheitide Infantum*, p. 127; and not to rest it solely on the results of my own experience.

ration was not put to the test; and even for a long time after it had been tried, but one instance was recorded of any other than an unsuccessful result.* In the year 1825, M. Bretonneau, of Tours, saved the life of a little girl, when in the last stage of croup, by performing tracheotomy, and the operation has since then been performed more than 150 times, and rather more than a fourth of the patients who underwent it recovered. By far the greater number of these successful cases occurred in France, while in England the result of almost every instance of the performance of tracheotomy in cases of croup has been so unfavourable that the operation is scarcely looked on as a justifiable proceeding. The great discrepancy of opinion between French and English practitioners, with reference to the value of tracheotomy in croup, can be explained only by the very different character which the disease presents in the two countries. In France croupal symptoms are induced in the majority of cases by the extension to the larynx of false membrane originally deposited on the fauces and soft palate, while the windpipe itself is comparatively seldom in a state of active inflammation, often altogether unaffected; and the bronchitis and pneumonia, which, in this country, so often and so seriously complicate the disease, are there of less common occurrence. In estimating the results of tracheotomy in France, it must likewise be borne in mind that in many instances the operation was performed on patients whose disease would probably have been amenable to other treatment, and that in some cases the trachea was opened without the previous adoption of any treatment whatever, and quite in the early stage of the affection.† But though we cannot infer that all the patients on whom tracheotomy was performed would have died if the operation had not been resorted to, these cases of premature tracheotomy at least prove the operation to be of itself unattended with very serious danger; while it is quite conceivable that the relief afforded by it to that spasmodic action of the muscles of the glottis, which endangers the patient's life more than the mere extent of false membrane in the air-passages, may contribute, in a most important degree, to arrest the advances of the disease. But whatever might be the result of the very early performance of tracheotomy, such a proceeding would be practicable only in an hospital; and we must base our conclusions, with reference to the operation, on a due consideration of the circumstances under which alone we are likely to have the opportunity of performing it. "There is," as Doctor Stokes, (on Diseases of the Chest. 8vo. Dublin, 1837, p. 220,) has observed, "always that kind of feeling connected with a surgical operation in acute diseases, which prevents its being proposed, assented to, or performed, unless under nearly desperate circumstances, and when all other means have failed. In the case before us, the operation is performed at a time when the situation of the patient is the worst possible for success; when the nervous system has been profoundly injured, and the lungs, even though no primary complication may have existed, have become extensively congested." Among my patients at the Children's Dispensary, I have never had recourse to the operation; partly for the reasons stated by Dr. Stokes, partly because it would have been impossible in the houses of the poor to command that constant attention and minute care which are absolutely essential to the success of tracheotomy, even when every thing in the patient's condition concurs to warrant its performance. Recently Mr. Arnott performed tracheotomy, at my request, on a boy, aged 21 months, who was admitted into the Middlesex Hospital in the last stage of croup, which had succeeded to measles, and which had been allowed to advance without any remedy being employed to check it. In this instance life was prolonged for forty hours after the operation, and the ingress and egress of air through the canula continued free to the last; but the child's pulse began to grow more frequent and feeble after the lapse of little more than twelve hours, and his respiration became at the same time hurried and laborious, and continued increasingly so until death took place. This being the only instance in which I have had the wind-pipe opened for the relief of the symptoms of

croup, it is not in my power to lay down any definite rules with reference to the time or manner of performing the operation. You will find the arguments against tracheotomy in croup most forcibly stated by Mr. Porter, in his work on the Surgical Pathology of the Larynx and Trachea, while an opposite opinion is very ably supported by a man of equal eminence, M. Troussseau, in a paper which is published in the first volume of M.M. Rilliet and Barthez' work on the Diseases of Children.*

I have endeavoured hitherto to direct your attention more especially to that form of croup which is of most frequent occurrence in this country, and in which the affection of the air-tubes is a primary idiopathic disease, calling for active antiphlogistic treatment. There is, however, another form of the disease in which the laryngeal affection is connected with inflammation of the tonsils, soft palate, and fauces, and the deposit of false membrane upon them; and in many of these cases the affection of the air-passages is evidently a secondary occurrence. The symptoms attending this variety of croup generally present more or less of an asthenic character, and corresponding modifications must be made in the treatment. In England this form of croup is comparatively rare; when it does occur, it is in crowded cities much oftener than in the country. The influence of unfavourable hygienic conditions in predisposing to it, is well illustrated by the statement of M. Guersent that the number of croup cases in the Hôpital des Enfants Malades has become greatly diminished since the wards have been less crowded with patients, and since other means have been adopted calculated to promote the health of the inmates. Another strong proof of the influence of causes unfavourable to health in inducing some varieties of croup is afforded by a further statement of the same writer, that the greater number of cases of croup in the Parisian hospitals have supervened in patients who were already in those institutions for the cure of other diseases.

In country districts unfavourable influences of a different kind seem to predispose to its occurrence. It is in those regions of France which are damp and ill drained that it presents itself in its most aggravated forms, and there, has not unfrequently assumed an epidemic character, and proved extremely fatal. In several instances such epidemics have broken out on the subsidence of an inundation; but at other times it has not been possible to assign any reason for the sudden appearance of the disease in an epidem-

* Although, for the reasons above stated, I have had almost no experience of tracheotomy in croup, yet it is quite impossible to have closely watched many cases of that disease without thinking much and anxiously upon the question of performing an operation for its relief. Among the arguments against the operation, too much importance appears to me to have been attached to the statement of Dr. Cheyne, that 3-8ths of the aperture of the larynx have been found free in fatal cases of croup, and that consequently there must have existed, during life, room enough for the entrance of air. I apprehend that bronchotomy is not performed on the crass mechanical principle of removing from the wind-pipe a quantity of matter which prevents the entrance of air into the lungs, but that it is done rather to obviate the dangers of that spasm of the glottis which the inflammation occasions, and which will not cease until either the inflammation is subdued, or the spasm relaxes with the approach of death. Even the narrow opening made into the trachea, often much narrower than the aperture of the larynx though diminished by swelling or encroached by false membrane, suffices to admit all the air which the patient needs, and for a time at least the dyspnoea is relieved. But the delicate mucous membrane of the bronchitis in the vast majority of cases exposed to immediate contact with the cold air of the ward of an hospital, or of a large chamber; bronchitis is thus excited or aggravated, and this secondary affection proves almost invariably fatal. It appears to me to be worth consideration how far the careful regulation of the temperature of the apartment, and of the condition as to heat and moisture of the air respired by the patient after the operation, might diminish the hazard from this source; and, secondly, it may merit inquiry whether there be any difference to be expected between the results of tracheotomy in cases of asthenic croup, such as formed the basis of Dr. Cheyne's observations, in which false membrane was very extensively deposited; and in cases of a more asthenic character, such as the chief of those were that came under my notice among the poor in London, in which the deposit of false membrane was very limited, and the larynx was the chief, sometimes the exclusive seat of disease.

* In this case the operation was performed in the year 1782 by the late Mr. André, of London, on a little girl 5 years old. The particulars are related in a dissertation published at Leyden in 1786 by Dr. T. White, whence they are extracted by Dr. Farre, and appended as a note to a paper of his on Croup, at p. 238 of vol. jii. of the Medico-Chirurgical Transactions.

† In illustration of this fact, two cases may be noticed, recorded in the Journal de la Société Médicale d'Inde et Loire, extracted and commented on in the Bull. Gén. de Thérapeutique, Oct. 1842.

muc form in neighbourhoods where for many years it had been unknown.

In this country it seldom, if ever, assumes those formidable characters which have often marked it on the continent, where the inflammation of the tonsils and pharynx have been very severe, and the formation of false membrane has not been limited to the fauces, but has occupied a great part of the mouth, and reached far down into the pharynx, as well as extending upwards into the nostrils. I cannot at all account for this difference between the disease in the two countries; but the mere extent of the false membrane does not seem to me to furnish any ground for supposing there to be an essential difference between the affection described under the name of *diphtheritis* by M. Bretonneau and other French writers, and that in which, with a much more limited deposit of false membrane, there has yet seemed to be the same connexion between the disease of the throat and of the air-passages.

This form of croup has come under my notice under two different conditions—either as an idiopathic affection, or as a complication of some other malady; the latter much more frequently than the former. In those cases where it has appeared as an *idiopathic affection*, slight febrile disturbance, and general disorder of the health, have usually preceded the local symptoms for some days. By degrees slight cough comes on, often associated with catarrhal symptoms, and attended with considerable drowsiness and heaviness of the head, and sometimes with slight difficulty of deglutition. The cough next assumes the loud clangose character of croup, and stridor becomes perceptible with the respiration. If the throat be examined, the fauces, soft palate, and tonsils, will usually be found either universally red, or streaked and spotted of a dark red colour. This condition is generally best marked on the tonsils, the under part of the velum, and the uvula, and is in most instances attended with but little tumefaction. Specks of false membrane, of a dead white or greyish white colour, next appear on the inflamed surfaces. I have seldom seen these deposits of false membrane become confluent, and never found them extend up into the mouth, even though the life of the patient had been seriously endangered by their extension to the larynx, while in many instances the affection of the throat may be altogether overlooked if care be not taken to depress the root of the tongue sufficiently to obtain a thoroughly good view of the fauces. When once the larynx has become effected, the symptoms are in the main the same as attend on the other form of croup, but there is less of that constitutional reaction which we observe in acute inflammation of important organs. The fever generally presents throughout much of an adynamic character; the drowsiness is often very considerable; and, if the case be neglected, the fatal termination may come on very speedily, and not ushered in by that urgent dyspnoea and those violent efforts to obtain air which attend most cases of cyanotic trachealitis. On the other hand, these cases occasionally run a somewhat chronic course. The employment of emetics having detached the false membrane, and the local application of caustics having for a time prevented their reproduction, the croupal symptoms diminish or altogether disappear; but a premature suspension of the treatment is soon succeeded by a return of the dangerous symptoms of the disease; and hence in this, not less than in the other form of croup, it behoves us to be most sedulously on the watch for any indications of returning mischief.

It is not an idiopathic affection that this form of croup has come most frequently under my notice, but as a most *dangerous complication of some other disease, almost always of measles*. Under these circumstances it frequently disappoints the most well-founded hopes of our patient's recovery, sometimes running its course very rapidly, at other times so insidiously that nothing but the greatest care will secure us against overlooking this most fatal malady.

This variety of croup seldom begins until the eruption of measles is on the decline, or the process of desquamation has commenced. Its occurrence is most frequent from the third to the sixth day from the appearance of the eruption, but it oftener occurs at a later than at an earlier period. It is sometimes attended with well-marked symptoms from the very first, but it often happens that the character of the disease is masked, and its course insidious, and that the degree of suffering during life affords no correct index to the amount of mischief which may be revealed by a dissection after death. Of itself it is highly dangerous, and its hazard is increased by the frequent co-existence with it of inflam-

mation of the lungs, which serves moreover to throw the symptoms of croup into the shade. When the laryngeal affection comes on three or four days after the appearance of measles, its presence is usually betokened by much more obvious symptoms than when it occurs after the lapse of a longer period from the febrile attack. Sometimes, however, it develops itself unnoticed, simultaneously with the measles, and causes a fatal issue when the medical attendant is least prepared to expect it. The child in such cases is more seriously ill than can be accounted for by the mere existence of measles; but he makes no definite complaint, neither are there any obvious indications of the special suffering of any particular organ. There are considerable drowsiness, disinclination to swallow, and reluctance to speak; but the cough may be very slight, and the respiration free from distant croupy stridor, while the child speaks in so low a tone that it is almost impossible to appreciate any alteration of the voice. Under such circumstances, the most careful observation is needed to avoid error. The loss of voice should of itself direct attention to the state of the larynx; the cry should be listened to attentively; pressure should be made on the larynx, to ascertain whether much tenderness exists, and examination of the fauces should never be neglected.

But little less obscure, and of much more frequent occurrence, are those instances in which the laryngeal affection attends the process of desquamation. Recovery up to a certain point had probably gone on well, when, sometimes with, sometimes without, an increase of the cough and morbillous catarrh, the febrile symptoms became exacerbated, and the child droops again, apparently without any adequate cause. Sometimes a loud sonorous cough, succeeded or accompanied by alteration of the respiratory sounds, betrays the nature of the disease; but at other times there are no symptoms besides unusual drowsiness, reluctance to speak, or alteration in the tone of the voice, with disinclination to swallow, or difficulty in the act of deglutition. In many instances deglutition is scarcely at all impeded; and I remember only one case in which the difficulty of swallowing was so great that fluids returned by the nose. But even though these symptoms be but slight, it will usually be observed, on examining the mouth, that the gums have a spongy appearance, or are actually ulcerated; that the tongue is preternaturally red and raw, and that small aphthous ulcers have formed upon its edges, and on the lining membrane of the mouth. The soft palate will usually be seen to be red and swollen, and specks of false membrane will be observed on the velum or tonsils. In such a case, if it terminate fatally, the duration of life is very variable: though the disease, for the most part, runs a somewhat chronic course. The child's strength declines daily, and emaciation makes rapid progress, yet no acute symptoms appear. There is great restlessness, and no posture seems easy to the child; or else it sits constantly upright in bed, distress and dyspnoea following any attempt to place it in the recumbent position. The alteration of the voice is succeeded by complete aphonia, the frequent hacking cough which had previously caused much annoyance ceases altogether; and although evidently thirsty, the child often refuses drink, or swallows with difficulty. Diarrhoea, or pneumonia, usually supervene, and hasten death, though in some instances exacerbation of the croupal symptoms, coupled with the increasing weakness of the child, are the only causes of the fatal termination.

On examining after death the bodies of children who have died of this affection, not only is the mucous membrane of the mouth found inflamed and ulcerated, but the soft palate, fauces, epiglottis, and upper part of the pharynx, are seen to be more or less intensely congested, and coated more or less extensively with false membrane. Once I observed false membrane to have reached from the pharynx for a short distance into the œsophagus; and on another occasion I found the œsophagus lined by a complete tube of false membrane, which had extended to within an inch of the cardiac orifice of the stomach; but I have never seen the interior of that viscus occupied by a similar production, though that would seem, according to the experience of French writers, not to be a very unusual occurrence. The epiglottis is often ulcerated on both its surfaces, and partially coated with false membrane; and the mucous membrane of the larynx is generally eroded by numerous small ulcerations, as well as covered with a similar deposit. I have in no instance observed false membrane extending below the larynx; and although the trachea is usually congested, sometimes intensely so, yet this is by no means of invariable occurrence. Bronchitis and pneumonia, especially the latter, are frequent complications of this affection.

Under whatever circumstances this form of croup may occur, whether as an idiopathic malady, or as a sequela of measles or some other disease, it is generally attended with so great a depression of the vital powers as to contraindicate the employment of active antiphlogistic treatment. When it occurs as an idiopathic affection, I have occasionally applied leeches to the throat if there were much tenderness about the larynx, or if the croupy symptoms had early acquired considerable intensity. The two means, however, on which I place my chief reliance are the careful and repeated cauterization of the fauces, and the employment of emetics. In most instances a solution of a scruple of nitrate of silver in an ounce of distilled water, applied by means of a sponge, or a piece of soft rag fastened on a small portion of whalebone, answers every purpose. If the deposit of false membrane be extensive, or the ulcerations about the tonsils present anything of a sloughy character, the strong hydrochloric acid, diluted with twice or thrice the quantity of honey, is a better application. At the same time that I adopt these local measures, I employ the tartar emetic in the same manner as in cases of simple cynanche trachealis, except that it is not always desirable to give it in such frequently-repeated doses as in the other more active malady. If relief be not speedily obtained, a mustard-poultice, or a blister, should be applied to the throat. In any case where the vital depression is very considerable, the mustard-poultice only should be employed, since, under such circumstances, a vesicated surface in the child often does not heal favourably. The slower course which these cases often run affords more time for the action of calomel than we often have in pure cynanche trachealis, and unless the presence of diarrhoea contraindicate its employment, the remedy is not to be omitted. It should be given in doses of one grain every hour to a child of three or four years old, combined with a quarter of a grain of ipecacuanha; but if symptoms be at all urgent, the emetic should be repeated every four or six hours, to detach any false membrane that may have been deposited on the fauces, and cauterization should be practised again to prevent their renewal. As improvement advances, the remedies may be repeated at longer intervals, while expectoration may be promoted by the employment of the decoction of senega, squills and ammonia, as has been already recommended. Care must be taken throughout not to depress the child too much by over active treatment; nourishment must be given from an early period, and even before it is safe to discontinue the cauterization of the throat and the occasional employment of emetics, the extract of bark in combination with its tincture, or some other form of direct tonic, may be needed.

When consequent on measles, the same general plan of treatment must be adopted, though with far slenderer prospects of cure. The cauterization of the throat is in such cases especially necessary; and the ulcerated condition of the mouth is often much benefited by the frequent application to it of a solution of two scruples of borax in an ounce of water. The tendency to diarrhoea often prevents the employment of calomel, while, owing to the weakened state of the system, we cannot always venture on the use of antimony. In such a case, we may still have recourse to mercurial inunction; and while the local cauterization is most sedulously attended to, emetics of ipecacuanha may be given two or three times a day, or the sulphate of copper may be substituted for it, if it cause purging, or fail to vomit. Here, however, more than in the idiopathic form of the affection, we find in many instances a most urgent necessity for supporting the child's strength, even from the very first. The occurrence of pneumonia is the accident most to be dreaded in the progress of the case, and may require a modification of the treatment, though in its management the asthenic character of the affection must always be borne in mind. Recovery is generally very slow, even in cases that terminate favourably; and it often happens that, after all alarming symptoms have been removed, the voice is long in regaining its proper character.

The peculiar sound that characterises the cough of croup, the stridor of the respiration, and the urgent dyspnoea, which attend the progress of the disease, result, as I scarcely need remind you, almost entirely from the spasmodic action of the muscles of the larynx, and not from the mechanical obstacle which the presence of false membrane may offer to the free admission or exit of air. We have seen that these symptoms are on the whole less marked in cases where the croup appears as a secondary affection, and the larynx becomes involved by the extension to it of disease be-

ginning in the throat, than in those where the air-passages themselves are primarily affected. Still, they vary much both in the period of their occurrence, and the degree of their severity, even in those cases that most closely resemble each other, and they bear no certain relation to the intensity of the inflammation any more than to the amount of the deposit of false membrane. The diversities in this respect depend on constitutional peculiarity rather than on any essential difference in the nature of the disease.

This view, indeed, is not to be taken by all writers, but some observers of deservedly high repute, such, for instance, as M. Guersent,* have conceived that there are differences sufficient to warrant our placing in a separate category those cases of croup which are marked by the predominance of spasmodic symptoms. They have proposed to designate the form of the disease by the name of *laryngitis stridula*, to distinguish it from ordinary croup, the *laryngitis pseudo-membranacea*. It was doubtless the observation of some cases of this kind, that led Dr. Millar,† nearly eighty years ago, to describe under the name of the acute asthma, a disease resembling croup in many respects, but presenting a mixture of spasmodic and inflammatory symptoms; the former predominating at the commencement of the disease, the latter towards its close. Dr. Millar appears, indeed, in some measure to have confounded two very different affections,—the true spasmodic croup, or *laryngismus stridulosus*, with the inflammatory croup, or *cynanche trachealis*, under the idea that they constituted the two stages of one disease. But, nevertheless, cases are sometimes observed that bear a very close resemblance to Miller's description, though no advantage seems to me likely to arise from constituting a new species of croup out of a modification in its symptoms produced by the idiosyncrasy of the patient.

In some children there is a greater tendency to spasmodic affections than in others; in such the laryngeal nerves will take the alarm at the very outset of the disease, and the paroxysm of dyspnoea will consequently commence at an early stage, and will soon attain great intensity, but may become masked by the permanent distress of breathing to which the disease in its progress gives rise. In other instances, the symptoms of inflammatory disease, and those of spasmodic disturbance, may be so commingled, or may so alternate with each other, as to render it hard to tell from which the child suffers most. This was the case with a little boy ten months old, who some years since came under my care, suffering from what seemed at first to be ordinary inflammatory croup. The symptoms, though not very urgent, were plainly marked, and the active employment of antimony soon dissipated them. During the whole course of the disease, however, the child, who seemed highly nervous and excitable, suffered from attacks of dyspnoea far more severe than could have been anticipated from the general mildness of the attack, or than would have been supposed to exist by any one who had seen the child only in the intervals of the paroxysms. The cough and respiration had for forty-eight hours entirely lost all croupy character, and nothing but catarrh seemed left behind, when the child was suddenly seized with extreme difficulty of breathing, attended with slight croupy noise; and lay stiff in his nurse's arms, with his thumbs drawn into the palms of his hands, and his great toe separated from the others. Four-and-twenty hours had elapsed from the superintention of these new symptoms before I was able to visit the child. He was then extremely restless, his face was flushed, his thumbs were drawn into the palms of his hands, and his feet were forcibly extended, his breathing was laboured, and attended with a hoarse croupy sound, which became still more distinct whenever the child coughed. The bowels had not acted for a couple of days, but an hour after my visit, some purgative medicine, of which large doses had been given during the previous six or eight hours, began to act, and produced three very copious evacuations, with perfect relief to all his symptoms. The carpopedal contractions disappeared, the respiration became easy, and the face ceased to be flushed or anxious. The child slept well through the night, was cheerful on the following day, and slight hoarseness attending his occasional cough was the only remaining symptom. In a day or two that also disappeared, and the child perfectly recovered.

* In the Article Croup, in vol. ix. of the 2nd edition of the Dictionnaire de Médecine, etc., Paris, 1835.

† Observations on the Asthma, and on the Hooping-Cough. 8vo. London, 1760.

The influence of that spasmodic element which enters so largely into the production of the symptoms of croup, is seen in many cases in the long persistence of a croupy sound with the cough, but in its subsequent recurrence, when a patient who has once had croup, catches cold. In these cases the nerves have doubtless not thoroughly recovered from the effects of the previous inflammation.

The spasmodic character of many of the symptoms of croup will become still more evident when we observe, as we shall do in the next lecture, the resemblance which they bear to these phenomena that attend some of the more purely nervous affections of the respiratory organs.

Even before closing this lecture, one or two illustrations may be adduced for spasmodic affection of the larynx in connexion with disease seated elsewhere.

M. M. Rilliet and Berthex have described a *spasmodic cough* that returns in paroxysms, is loud, attended with an imperfect hoop, and may be easily taken for hooping-cough by the inattentive observer. It is, however, a *symptom of bronchinal phthisis*, due to the extension to the larynx of irritation seated in a distant part of the respiratory organs.

Intestinal irritation is a frequent cause of nervous cough in childhood. It is sometimes a loud, solitary, ringing cough—the tæsis ovilla, tæsis ferina of medical writers; at other times it is a short dry cough, attended with no particular inconvenience, but teasing from its frequency. Both of these forms appear to result in many instances from the presence of worms, and speedily cease under the judicious employment of purgative medicines.

Lastly, I may once more remind you of the cough which is occasionally heard in the early stage of inflammatory affections of the brain. It is a very short, hoarse cough, which sometimes continues for a few minutes almost incessantly, then ceases for a time, and then, after a pause, returns again. The disturbance of the brain is sympathized in by the larynx, and the depletion which relieves the former organ, removes the irritation of the latter.—*London Medical Gazette.*

MATERIA MEDICA AND CHEMISTRY.

Experiments with the Chloride of Olefiant Gas. By R. M. GLOVER, M.D., &c.—The composition of these bodies, taking the compounds of chlorine as examples, is $C_1 H_3 Cl$ + H Cl. for the chloride of olefiant gas; and $C_2 H Cbl_3$ for chloroform.

In the investigation of the properties of these bodies, I shall first show the striking resemblance in leading characters among the members of the group, and then take chloroform as an example of some of their more minute properties.

Expt. 53d.—Thirty minims of the chloride of olefiant gas were introduced into the jugular of a small but lively mongrel dog eight months old. Immediately the animal commenced a series of short barking yells, each of which was synchronous with expiration. Before the operation, the respirations were 48; after it, they became 68 in the minute; expiration made with great effort of the abdominal muscles. The heart's action was quickened and irregular, but masked by the state of the respiration. From the first, he lost all power of locomotion, but retained consciousness. In twenty minutes, his chest being pressed with a view to auscultation, he redoubled the barking yells. He was now placed near the fire, where he remained lying on his side; the eyelids at first half closed. Large bubbles could be heard in the chest, and there was a clacking noise in the mouth proceeding from movements of the soft palate. In an hour and a quarter from the operation, he made an effort to get on his legs, and succeeded, but speedily fell again on his side, and lay in this position. At this time the respirations were 82, and distinct crepitations could be heard. The bubbles continued of the same extensive character. A singular phenomenon appeared about the second hour. This was a suspension of the respiration during a period of fifteen seconds, the length of which never varied, but which occurred at

irregular intervals, on the average, at every half minute. This suspension might be a protracted expiration. The respirations gradually became slower, the heart's action imperceptible; the animal heat declined rapidly; towards the third hour, a little before death, the temperature was 63° in the axilla, 72° in the groin, and 82° in the rectum; the temperature of the room being 62° .

Inspection.—The mouth was open and tongue pendent; the smell of the chloride, which had been felt in the breath almost as soon as the substance was introduced into the jugular, still remained at the mouth. The voluntary muscles contracted when cut; five minutes after death the heart had no irritability. Peristaltic movement of the intestines continued. Nearly an ounce by measure of bloody serum was found in each pleura. The right side of the heart contained a little fluid blood; left side nearly empty. The left lung was so black and engorged as to surpass any pathological state previously witnessed by Dr. R. Elliot or myself. The organ was only crepitant in one or two spots near the entrance of the bronchi. The texture was easily broken down, and the whole might be described as one vast apoplectic spot. The right lung presented a very similar state. On cutting into the pulmonary tissue, much blood and bloody froth issued; the latter filled the bronchi. The membranes of the brain and spinal cord were vascular; section of the brain showed several bloody spots.

Expt. 55th.—Forty minims of the chloride were introduced into the stomach of a stout male rabbit. Immediately after the operation, symptoms similar to those observed in the previous experiment came on. For the first forty minutes the respiration might be styled asthmatic, inspiration being quick and expiration protracted, and made with a wheezing noise. During this time the heart's action was quick, feeble, and irregular; the pupil dilated, and iris little contractile; the eyes suffused with watery fluid. There was great loss of power over the voluntary muscles. He partly recovered from this state, but was found dead ten and a half hours after the operation.

Inspection.—Body very rigid; jaws firmly closed; nose and mouth bloody. The principal internal appearances were, congestion of the lungs, dark fluid blood in both sides of the heart, and pink-coloured froth in the bronchi, with slight congestion of the brain, and softening of the gastric mucous membrane, which was dotted here and there with dark spots.

Experiments with Chloroform and Bromoform.—*Expts. 57th and 58th.*—In the former of these experiments sixty minims of chloroform killed a poodle dog when injected into the jugular, in forty-five seconds, with symptoms similar to those occasioned in Experiment 54th. In the 58th experiment, twice the quantity killed a large dog of Newfoundland and greyhound breed, with about the same degree of rapidity, and much the same symptoms. In both cases, when the chest was opened with the least possible delay, the heart was found gorged with clotted blood, and its irritability destroyed. The muscles of voluntary motion contracted after death, and the peristaltic action went on. The lungs were congested to a surprising degree, and the bronchi filled with frothy serum.

Expts. 59th and 60th were performed on rabbits, into whose stomachs chloroform and bromoform were introduced, when effects were produced similar to those resulting from the similar administration of the chloride and bromide of olefiant gas.

Expt. 61st.—A bitch full grown, between the beagle and pointer, was the subject of this experiment. Thirty minims of chloroform were injected into the jugular vein, a hamadynamometer being connected with the femoral artery. In three or four seconds after the chloroform was introduced, the mercury fell from six inches above the level at which it had been oscillating; in a minute and a half it had fallen

to an inch; the heart's pulsations were manifested regularly during the descent, and were slower and more regular than before the operation. At the lower level, the oscillations became more considerable, sometimes carrying the mercury up to three inches, owing probably to struggles and expiratory efforts. In about two minutes the mercury began to rise, and attained the level of two inches. It continued to oscillate more regularly from this to a few inches higher, until ten minutes after the operation, when the animal was unbound; she was in a state of excessive prostration, but gradually recovered.

Expts. 62d.—Sixty minims of chloroform were very slowly injected into the jugular of a large shepherd's dog.

Symptoms.—Irregular and hurried action of the heart; struggles; quick and forcible expiration, accompanied with a short bark; dilatation of the pupil; discharge of urine, and a temporary spasm, during which he was bent backwards. All this took place in two minutes. After this he lay still for three minutes; no respiration perceptible; the heart's action excessively feeble. He then began to breathe again, and gradually recovered, the recovery being attended for some time with great disorder of the respiration, loss of power over the voluntary muscles, and great prostration. Next day he was unwilling to move, and the respiration continued laborious. Four days after the operation he was poisoned by prussic acid, when the lungs were found to retain marks of the great congestion produced by this class of poisons.

Expt. 63d.—The same quantity of chloroform as in the preceding experiment was injected into the carotid artery of a lame pointer bitch, in the direction of the circulation. No struggle followed the injection of the fluid; a forcible inspiration, succeeded by a single expiration, ensued; the urine was voided, the heart continued to beat feebly, when every other sign of life was extinct. The animal was quite dead in a minute and a half.

The chest was immediately opened; the muscles contracted strongly on being cut; the heart, which was gorged on its right side, relieved itself of some of its contents on incision being made into it; the left side contained dark-coloured fluid blood. The lungs had collapsed on opening the chest, and seemed quite healthy; the membranes of the brain were much congested, there was much serum in the ventricles, and bloody serum at the base of the brain.

Expt. 64th.—Sixty minims of chloroform were injected into the peritoneal cavity of a large male rabbit. Death ensued in seventeen minutes.

Symptoms.—Slight transitory excitement; loss of power over the limbs; profound coma; excessively dilated pupil; heart's action feeble; great excitement of the respiration, and dilatation of the chest; a few slight movements of the limbs synchronous with the respiration. No motion could be excited by pricking or pinching the limbs; nor did the eyelids move on approaching an object to the eye. He passed urine a few minutes before death.

Inspection.—Small intestines greatly congested externally, and their coats hardened where the chloroform had touched; a large oval ecchymosis, which might equal the superficies of a half-crown, was visible between the muscular and peritoneal coats of the stomach. On cutting into the chest, the lungs collapsed, but contained much dark coloured blood. The heart had dark blood in both its cavities, and retained its irritability. The peristaltic action was stopped, and the voluntary muscles had little contractility. The brain was healthy; the smell of chloroform was distinct in the chest, and in the urine passed a few minutes before death.

Expt. 65th.—Sixty minims of chloroform, in this experiment, killed a rabbit in half an hour when injected into the stomach. The symptoms were first those of action on the spinal cord, or primarily possibly on the sympathetic system; the respiration became affected, and coma supervened.

After death, the mucous membrane of the stomach was found white and corroded near the œsophagus; over the rest of the cardiac portion dotted with purple patches of ecchymosis. The epithelium was removed from the pyloric portion, and the mucous membrane reddened.

In other experiments with this substance on rabbits, the animals which recovered from the primary effects of its introduction into the stomach were sometimes found to die of the acute gastritis thus induced.

Remarks.—Great resemblance exists among the properties of this class of bodies, which appear to form a new order of poisonous substances, uniting in themselves physiological properties which are not found united in any other known class of poisons. The distinguishing characteristics are, first, the remarkable power they possess of obstructing the pulmonary circulation, whether they are injected into the veins or introduced into the stomach; then the action on the spinal cord and afterwards on the brain; and lastly, the corrosive and irritant action exercised on the stomach. In the case where chloroform was injected into the carotid, death appears to have been produced by the loss of nervous action consequent on the direct action of the poison on the brain. This effect might be accounted for by the obstruction to the flow of blood through the capillaries of this organ thus induced. The mechanical properties of this class of bodies may peculiarly fit them for obstructing the circulation through the lungs. It was shewn, for instance, that, when injected into the jugular, their smell is almost instantly perceptible in the expired air, so that the vapour getting into the air-cells may place the blood much in contact with the substance. The action on the spinal cord is very different from that of strychnia, to which my friend Dr. Cogswell compared it in the case of iodoform. Strychnia destroys the influence of the will over the muscles, but appears to excite the spinal cord, which loses its sensibility under the action of this class of poisons. The blackening of the mucous membrane of the stomach which these substances produce, is another curious property. This effect appears to be compounded of the corrosive and irritant action of the poison, its effects on the colouring matter of the blood, and that congestion of dark blood found in the stomach in certain cases of coma.

Where the poison was introduced directly into the circulation, we had the heart's action put a stop to, and its irritability destroyed, where the dose was large. In other cases a smaller dose caused obstruction to the flow of blood through the lungs, while the heart's action continued; and in one case this obstruction was shown by the hæmadynamometer. In that case the pressure in the arterial system was diminished, but the heart's action continued.—*Edinburgh Medical and Surgical Journal for 1842.*

THE
British American Journal.

MONTREAL, APRIL 1, 1848.

MEDICAL FEES AT CORONER'S INQUESTS.

A Bill was introduced with this object in view, at the Parliamentary session just ended, by the Hon. J. H. Cameron, and we are pleased to observe that a measure has been at last proposed, to compensate medical men for their services on such occasions, no adequate provision having been heretofore made for them in Upper

Canada. Having carefully perused the Bill, we consider it faulty in several particulars, and in the matter of fees especially so. By the Bill, the Coroner is empowered to summon any medical witness whom he pleases, and the medical witness is bound to obey the order, or pay a penalty of ———, unless "he can show good and sufficient reason for not having obeyed it." To this compulsory power on the part of the Coroner we see no good ground for objecting, were the witness afterwards to be remunerated according to a proper scale; but this, we think disproportionate to the services rendered, and bearing no relation to the fine for disobedience likely to be imposed, which will not be, we apprehend, less than £5, "to be levied by distress and sale of the offender's goods."

The third clause of the Bill, contains the scale of remuneration for professional services, which it is proposed shall be £1 5s. for an opinion without a *post mortem* examination; £2 10s. for an opinion and *post mortem* examination; and £5 for an opinion, *post mortem* examination, and chemical analysis of the stomach and intestines if required. Now, we conceive that the fee for the *post mortem* examination should not be less than £3 15s., the sum allowed in this section of the Province; and the fee of £5 for the chemical investigation, is quite disproportionate to the service demanded. The detection of poisons is one of the most delicate operations which the medical jurist has to perform. It requires dexterity in manipulating, the result of practice, intimate chemical knowledge, which is not to be acquired without study, and, above all, time, which might extend over several days. These circumstances, super-added to which is involved in an eminent degree the professional character of the operator, demand that for the performance of such work, the remuneration should be at least adequate to its nature. In Dublin, we are informed that the lowest fees obtained for such services, is £12 10s. sterling, over and above the fee for the *post mortem* examination, and it should certainly not be less here. The lawyer is remunerated for an opinion, involving contingencies of much less moment than life, at a far higher rate, and the Profession should demand (now that legislation is being attempted for it) a scale of remuneration for its services proportionate to their value.

The third clause, moreover, contains the scale of remuneration, in going to and returning from the inquest, which is fixed at one shilling per mile, for each mile of travel to and from it. In this respect the medical witness is worse off than the Coroner himself, who, besides the shilling per mile, is allowed his necessary expenses while absent from home. It must be

borne in mind, that in the compulsory fulfilment of this duty, the practitioner is called upon to throw aside all his other professional engagements; and how far his time would be compensated, and his services remunerated, by the foregoing payment, with the possibility of his attendance being further compensated by a \$5 bill, is a question about which, we think, there can be no difference of opinion.

The Act again expressly limits the power of the Coroner to the summoning of *medical* witnesses, by whom it is expected that the services are to be wholly performed. If the medical witness be unable to examine chemically the stomach or its contents for a poisonous agent, and we maintain that this is an operation which all medical men are not able to perform satisfactorily, however well they may be acquainted with the procedure theoretically, the Coroner is precluded from calling in to his assistance a *non-medical* witness, or should he do so, a legal doubt may arise as to his ability, from the wording of the Act, to fee him. Now, we have ourselves received, on one occasion, the contents of a stomach from Upper Canada, for examination, and we are aware, that the Professor of Chemistry at King's College, who is not a medical man, has had a similar duty to perform on more than one occasion. The provisions for the remuneration of services under such circumstances, should not be restricted to the medical Profession. The intention is, for the ends of justice, to get the operation performed, and that well; and no matter who he is who performs it, the means of remuneration ought to be beyond a question.

The Bill has exclusive reference to Upper Canada, but we do not see why the provisions of such an Act might not be made to extend to the Lower Province which requires legislation also on this matter. We notice this Bill as a matter of duty to the Profession in Upper Canada, and have expressed our own opinion upon it: and in inviting the attention of the Profession to the subject, we should desire to see some expression of their ideas in our columns.

FRONTIER MEDICAL SOCIETY.

To the Editor of the *British American Journal*.

Odetown, March 26, 1848.

Dear Sir:—Knowing, from your noble and disinterested advocacy of the cause of the profession, the deep interest you feel in its weal, and the pleasure that any movement tending to its advancement will give you, I beg to enclose for publication (if you deem them worthy) the minutes of the proceedings of two meetings that we have had on the frontier. These are but merely preliminary, it being our intention, after we have become

organised, to bring up at each meeting some professional matter of interest for discussion.

This will produce habits of reading, thinking, and observing, which will be very beneficial, I should hope, in their results. We number about twelve members, but the requirements of country practice preclude the possibility of our being all together at each meeting.

We have named the society the "*Frontier Medical Society*."

You will perceive by the dates, that I have allowed some time to elapse since our meetings, without sending you the proceedings. This I must account for by saying, that I thought the publication of them might be to the exclusion of more valuable matter; but, on the other hand, if our "*premier pas*" should be the means of inducing others to form similar societies, I think it would be a very effective means of banishing quackery, and of elevating the profession to that standard, which, from the highly scientific acquirements of its members, it ought to occupy.—I am, &c.,

HENRY T. LORD, Secretary.

Clarenceville, September 28, 1847.

At a meeting of medical men, held at Clarenceville, present, Drs. May, Verity, Stuart, Livingston, Delisle, Dykeman, and Lord, Dr. May being called to the chair, and Dr. Lord being requested to act as Secretary;

Proposed by Dr. Verity, seconded by Dr. Livingston:

Resolved, That a society be formed, to be called, "*The Frontier Medical Society*," to consist of licensed members of the profession on the frontier.

Proposed by Dr. Delisle, seconded by Dr. Stuart:

Resolved, That such society meet twice a year, once at mid-summer, and once at mid-winter, at such time and place as may be notified to the members by the secretary.

Proposed by Dr. Verity, seconded by Dr. Delisle:

Resolved, That the purposes for which this society is formed, should extend to the following objects: the suppression of unlicensed practice; the regulation of a tariff of fees; the suggestion of by-laws to the College of Physicians and Surgeons, C. E.; and the promotion of friendly intercourse between the members of the profession.

Proposed by Dr. Stuart, seconded by Dr. Verity:

Resolved, That the secretary be requested to invite by letter all the members of the profession along this frontier to join the society, for the furtherance of the purposes above mentioned, and also for the suggestion of such alterations and improvements as may be deemed necessary.

Proposed by Dr. Livingston, seconded by Dr. Verity:

Resolved, That the next meeting of this society take place on the last Wednesday in January, 1848.

(Signed) H. N. MAY, President.

HENRY T. LORD,

Acting Secretary, *pro tem*.

The meeting appointed for the last Wednesday in January was unavoidably postponed to the 9th February, in consequence of the state of the roads.

Clarenceville, February 9, 1848.

At the second meeting of the Frontier Medical Society, present, Drs. May, Barber, Laffin, Delisle, Dykeman,

and Lord, the proceedings of the last meeting having been read:

Proposed by Dr. Barber, seconded by Dr. Lord:

Resolved, That a petition be presented to His Excellency the Governor General, and the other branches of the legislature, remonstrating against a bill, entitled, "*Bill pour régler l'étude et la pratique de la médecine*," &c. &c., signed by J. Emery Coderre, and others, as we consider the introduction of such bill would be injurious to the profession in general, and to practitioners on the frontier in particular.

Proposed by Dr. Dykeman, seconded by Dr. Delisle:

Resolved, That in the petition we state, that we are desirous of such an election of governors as will give a just representation to the frontier and townships, feeling that residents in cities, and persons unacquainted with country practice, are not capable of framing such laws and by-laws as will be suitable for country practitioners.

Proposed by Dr. Lord, seconded by Dr. Laffin:

Resolved, That the secretary be empowered to write to the secretary of the Medical Association, demanding what countenance this society is to expect from them, in the apprehension and prosecution of unlicensed practitioners, and in the suppression of illicit practice.

Proposed by Dr. Delisle, seconded by Dr. Laffin:

Resolved, That a committee be formed, consisting of Drs. May, Barber, and Lord, to meet at Clarenceville on Friday, 18th inst., to draft a petition according to these resolutions.

Proposed by Dr. Delisle, seconded by Dr. Dykeman:

Resolved, That this meeting be adjourned.

(Signed) H. N. MAY, President.

HENRY T. LORD,

Acting Secretary, *pro tem*.

[We publish the foregoing proceedings of our Frontier brethren with great pleasure, and we hope the example, which they have thus so nobly set, in discountenancing by every legitimate means, the unlicensed practice of medicine, and in advancing the status of the Profession in their own District, will be elsewhere followed. We are particularly pleased at the stand which they have taken against the "*Repeal Association*." It proves to us, that the opinions which we have advocated in this Journal, are approved of, and that by men whose good opinion is desirable, who seek for the general good of their Profession, who see in the Act of Incorporation much to be desired, and who, regardless of the manner in which the Townships have been treated, by not being represented in the Council of the College, yet view this disfranchisement as but temporary, and, for the sake of their Profession, rather submit to this personal sacrifice, than sanction the reckless dismemberment, which it was sought to obtain. We honour them for it; and we hope the example which they have set will be generally followed. At the next election, ample justice will be done them.

While upon the subject of Frontier questions, we cannot forbear alluding to a circumstance of a disagreeable character, which has come to our knowledge,

so frequently, as to deserve some notice at our hands. An officer, high in rank, who some years ago exchanged his lancet for a sword, is openly, and in defiance of professional opinion frequently and freely expressed, countenancing and assisting in practice, an American quack, who is unlicensed even in his own country, to the prejudice of the Physicians located in the District, and in violation of the law of the Province. We are not desirous of using names, but we beg to assure that gentleman, that as our advocacy of the general interests of the Profession has been throughout, and before our editorial career, of the most unmistakable character, so is it our prerogative to watch over its interests in particular sections; and this we will do in the same fearless and independent manner, that has ever marked our career. Against this violation of the ethics of the Profession, for the offence is not the less against the Profession generally because occurring in a frontier section, we at this present moment indignantly protest. We take this opportunity of warning the gentleman alluded to, of the impropriety, to use the mildest word, of his conduct, and most emphatically to assure him, that if there is no other court before which he can be arraigned, we shall place him at the bar of Professional opinion in the columns of our Journal. Either an officer of high rank on active duty, or a Physician in active practice, he may be at his option; but both, at one and the same time, he shall most distinctly not be.—ED.]

Meetings of the College.—We beg to refer our readers to our advertising columns, in which will be found the notice for a meeting of the Governors, and of the Corporation; the latter for the purpose of considering a code of by-laws, which will be submitted at the time. We believe it is the intention of the committee immediately to publish a copy of them in the English and French languages, for the purpose of being placed in the hands of every member of the Corporation for their careful examination.

The Repeal Association.—While the House was in session, we have understood, that a meeting of the medical members of the Legislative Assembly was convened, by the leaders of the Repeal Association, to take their proposed Bill into consideration. It has been currently reported, and we believe not without good foundation, that the members stated, that the measure proposed would receive no sanction at their hands, and that the most influential of them expressed their determination to offer the proposed Bill, contemplating the repeal of the Act, their most determined opposition. Matters, we think, are thus indefinitely procrastinated. "The earth has bubbles, as the water hath, and this is of them."

French Version of the Disinfecting Experiments in Canada.—We quote the following from our cotemporary,

the *London Medical Gazette*. It is a literal translation from the original article in *L'Union Medicale*. We are certain our readers will be highly amused with the ingenuity which the French translator has displayed in his version, the original of which appears to have been our own remarks on the subject.

"A few months since, the English journals of all kinds, and the proceedings of Parliament, were occupied with the comparative merits of the disinfecting liquids proposed by Sir William Burnett and M. Ledoyen. These liquids were described as infallible agents for preventing the spread of typhus, and destroying contagion. An offer was made to the two inventors by the English government that they should go out to Canada and make their experiments there. Both accepted the offer; they started for Quebec, and the disinfecting liquids were tried. The results were in favour of the liquid of Sir Burnett. But the most remarkable fact is, that these pretended chemists announced that their liquids would be most effectual preservatives against typhus. Sir Burnett escaped an attack, but M. Ledoyen was not so lucky; he caught the typhus fever, and owed his life only to a good constitution. One of his companions, Colonel Calvert Holland, who went out with him, fell a victim to the fever; as if to show in his own person the futility of the means, the value of which had been so grossly exaggerated."

NOTICE TO CORRESPONDENTS.

Dr. G. A. Purvis, Gananoque: In referring to the published list of licentiares, our correspondent will perceive his own name in its proper place. With reference to the other matters alluded to in his letter, as it is impossible to effect his object this spring, we will defer answering the question more definitely until a week or two hence, when we hope more leisure will fall to our lot than we have enjoyed since his letter reached us.

Dr. Morrin's letter has come to hand.

Dr. Von Island's letter, with his paper, has arrived at its destination. The first part will appear in our next.

We are obliged further to postpone several communications.

BOOKS RECEIVED.

The Medical Examiner. March.

London Medical Gazette.

Dublin Medical Press.

Boston Medical and Surgical Journal, from December 1 to March 8, in a parcel, and subsequently to 15th. We express our sincere acknowledgments to our Boston contemporary, for his politeness. We hope our other exchanges, will perform the like good office through Messrs. R. & G. Wood, New York.

Journal of Education. No. 2.

Report of the Eastern Asylum, Virginia, for 1847.

Report of Pennsylvania Hospital for the Insane.

Medical News and Library.

Dental Intelligence and Record. Vol. IV. No. 1.

Provincial Medical and Surgical Journal.

The Annalist. The Editor would confer a favour by sending us No. 8, Vol. I. which never reached us, and the Index to Vol. I. which also never came to hand.

OBITUARY.

At Quebec, on Sunday morning, the 27th February, aged 29 years, Dr. R. W. Stansfield, of that city.

At Sorcel, on the 15th ult., Leon Gauthier, Esq., M.D., aged 28 years.

At Philipsburg, on Monday the 27th instant, Dr. H. N. May, aged 46 years and 10 months. As a physician, his skill, kindness, and unwearied attention, won the confidence of all who had need of his services; while, in all the social relations of life, his urbanity, benevolence, his high sense of honour and unimpeachable integrity, rendered him beloved by all who had the happiness to know him.

ERRATUM IN OUR NUMBER FOR MARCH.

Page 302, line 52, for "*denied poisonous nature,*" read "*acrid poisonous nature.*"

BILL OF MORTALITY for the CITY of MONTREAL, for the month ending FEBRUARY 29, 1848.

DISEASES		Male.	Female.	Total.	Under 1.	1 & under 3	3 — 5	5 — 10	10 — 15	15 — 25	25 — 35	35 — 45	45 — 55	55 — 75	75 upwards
EPIDEMIC OR INFECTIOUS,.....	Small Pox,.....	5	4	9	2	3	1	2	2	1	.	.	.	.	.
	Scarlatina,.....	3	9	12	.	5	3	2	.	.	.	.	.	.	.
	Fever, incl. Typh.	16	12	28	7	5	5	1	1	.	1	6	.	2	.
	Dentition,.....	13	4	17	4	13	.	.	.	.	.	.	.	.	.
DISEASES OF BRAIN AND NERVOUS SYSTEM,.....	Convulsions,.....	1	1	2	2	.	.	.	.	.	.	.	.	.	.
	Hydrocephalus,.....	1	2	2	1	1	.	.	.	.	.	.	.	.	.
	Paralysis,.....	1	.	1	1	.	.	.	.	.	.	.	.	1	.
	Conges. of Brain,.....	1	.	1	1	.	.	.	.	.	.	.	.	.	.
DISEASES OF THORACIC VISCERA,.....	Apoplexy,.....	.	1	1	.	.	.	.	.	.	.	.	.	1	.
	Consumption,.....	8	11	19	.	.	.	1	.	5	2	8	3	.	.
	Pneumonia,.....	2	1	3	.	.	.	.	.	1	1	.	.	1	.
	Croup,.....	1	1	1	.	1	.	.	.	.	.	.	.	.	.
	Hooping Cough,.....	2	1	3	1	2	.	.	.	.	.	.	.	.	.
	Disease of Heart,.....	.	1	1	.	.	.	.	.	.	.	1	.	.	.
	Bronchitis,.....	1	1	2	.	1	.	.	.	.	1	.	.	.	.
	Empyema,.....	1	.	1	.	.	.	.	.	1	.	.	.	.	.
DISEASES OF ABDOMINAL VISCERA,.....	Hydrothorax,.....	1	.	1	.	.	.	.	.	.	.	1	.	.	.
	Diarrhœa,.....	11	6	17	9	4	2	2	.	.	.	.	.	.	.
	Cholera,.....	.	1	1	.	.	.	.	.	.	.	.	.	1	.
	Dropsy,.....	3	.	3	.	.	.	1	.	.	1	.	.	1	.
OTHER CAUSES AND DISEASES, AND DISEASES NOT SPECIALLY DESIGNATED,.....	Disease of Liver,.....	1	1	2	.	.	.	.	.	.	2	.	.	.	.
	Marasmus,.....	11	7	18	14	2	.	1	.	1	.	.	.	.	2
	Debility,.....	.	2	2	.	.	.	.	.	.	.	.	.	.	.
	Still-born,.....	1	2	3	2	.	.	.	.	.	.	.	.	.	.
	Unknown,.....	5	2	7	4	.	1	1	1	.	.	.	.	.	.
	Other Diseases,.....	13	1	14	3	2	.	.	.	.	2	3	1	3	.
Total,.....		101	70	171	51	37	14	11	4	9	8	21	5	9	2

MONTHLY METEOROLOGICAL REGISTER AT MONTREAL FOR FEBRUARY, 1848.

DATE.	THERMOMETER.				BAROMETER.				WINDS.			WEATHER.		
	7 A.M.	3 P.M.	10 P.M.	Mean.	7 A.M.	3 P.M.	10 P.M.	Mean.	7 A.M.	Noon.	6 P.M.	7 A.M.	3 P.M.	10 P.M.
1,	+22	+29	+25	+25.5	29.36	29.39	29.53	29.43				Snow	Snow	Fair
2,	" 21	" 27	" 14	" 24.	29.62	29.65	29.65	29.64				Fair	Fair	Fair
3,	" 5	" 23	" 22	" 14.	29.70	29.63	29.61	29.65				Fair	Fair	Fair
4,	" 20	" 37	" 33	" 28.5	29.58	29.41	29.30	29.43				Fair	o'erc'st	Fair
5,	" 27	" 26	" 23	" 26.5	29.18	28.99	28.98	29.05				Snow	Snow	Sto'my
6,	" 23	" 27	" 22	" 25.	29.06	29.07	29.17	29.10				Fair	Fair	Snow
7,	" 19	" 22	" 15	" 20.5	29.55	29.40	29.52	29.49				Snow	Snow	Fair
8,	" 8	" 20	" 14	" 14.	29.67	29.71	29.79	29.72				Fair	Fair	Fair
9,	" 7	" 21	" 17	" 14.	29.94	29.72	29.54	29.73				Fair	Fair	o'erc'st
10,	" 20	" 8	- 4	" 14.	29.51	29.75	29.95	29.74				Fair	Fair	Fair
11,	- 7	" 6	- 0	- 1.	30.16	30.18	30.22	30.19				Fair	Fair	Fair
12,	- 4	" 14	- 1	+ 5.	30.24	30.25	30.27	30.25				Fair	Fair	Fair
13,	- 0	" 19	+ 5	" 9.5	30.30	30.29	30.07	30.19				Fair	Fair	Foggy
14,	+ 2	" 22	" 18	" 12.	29.94	29.77	29.74	29.82				Fair	Fair	o'erc'st
15,	" 14	" 21	" 20	" 17.5	29.77	29.78	29.82	29.79				Fair	Fair	Fair
16,	" 10	" 24	" 21	" 17.	29.87	29.84	29.84	29.85				Fair	Fair	Fair
17,	" 19	" 30	" 18	" 24.5	29.86	29.81	29.90	29.86				Fair	Fair	Fair
18,	" 11	" 31	" 20	" 21.	30.01	30.00	29.93	29.98				Fair	Fair	Fair
19,	" 14	" 37	" 25	" 25.5	29.89	29.70	29.63	29.74				Fair	Fair	Fair
20,	" 21	" 32	" 34	" 26.5	29.50	29.25	29.08	29.28				Fair	Snow	Rain
21,	" 33	" 34	" 31	" 33.5	29.11	29.40	29.65	29.39				Snow	Fair	Fair
22,	" 22	" 44	" 36	" 33.	29.76	29.71	29.65	29.71				Fair	Fair	Fair
23,	" 33	" 38	" 26	" 35.5	29.54	29.58	29.71	29.61				Snow	Cloudy	Fair
24,	" 16	" 22	" 5	" 19.	29.90	29.87	30.11	29.96				Fair	Fair	Fair
25,	" 0	" 13	" 3	" 6.5	30.30	30.24	30.24	30.26				Fair	Fair	Fair
26,	" 7	" 25	" 16	" 16.	30.17	29.90	29.73	29.93				Fair	Fair	Fair
27,	" 13	" 13	" 3	" 13.	29.76	29.86	30.00	29.87				Fair	Fair	Fair
28,	- 5	" 24	" 21	" 9.5	30.00	29.69	29.39	29.69				Fair	Fair	Snow
29,	+19	" 26	" 17	" 22.5	29.23	29.24	29.34	29.27				Snow	Snow	o'erc'st

Therm. } Max. Temp., +44° on the 22d
 } Min. " - 7 " 11th
 Mean of the Month, +19°.

Barometer, } Maximum, 30.30 In. on the 13th & 25th.
 } Minimum, 28.98 " " 5th.
 Mean of Month, 29.71 Inches.

MONTHLY METEOROLOGICAL REGISTER AT H.M. MAGNETICAL OBSERVATORY, TORONTO, C. W.,—FEBRUARY, 1898.
 Latitude 43°. 39'. 4. N. Longitude 79°. 21'. 5. W. Elevation above Lake Ontario, 108 Feet.—(For the Brit. Amer. Jour. of Med. and Phys. Science.)

DAY.	Barometer at Temp. of 32°.			Temperature of the Air.				Tension of Vapour.			Humidity of the Air.			Wind.			Inches on gage.	WEATHER.				
	7 A.M.	3 P.M.	10 P.M.	Mean of 24 h.	7 A.M.	3 P.M.	10 P.M.	Mean of 24 h.	7 A.M.	3 P.M.	10 P.M.	Mean of 24 h.	7 A.M.	3 P.M.	10 P.M.	Mean of 24 h.			7 A.M.	3 P.M.	10 P.M.	
1,	29,258	29,328	29,427	29,354	27.0°	28.8°	17.6°	24.50	0.97	1.00	0.92	1.01	.64	.63	.91	.75	SW by W	W.	Calm.	—	Orcast till 5 pm. Clear from 6 pm	
2,	29,428	29,418	29,408	29,417	21.2	35.8	31.4	31.27	1.10	1.42	1.66	1.52	.94	.68	.95	.87	Calm.	E.	Calm.	—	Gen clear. Light chds occurs. Fine	
3,	29,406	29,398	29,365	29,377	27.0	40.2	28.6	32.01	1.44	1.69	1.42	1.53	.68	.88	.90	.86	E. by N.	S. S. W.	Calm.	—	Light pass. chds. Gen clear. Very fine	
4,	29,198	29,952	29,964	29,014	38.0	36.7	32.0	33.85	1.62	2.04	1.70	1.71	.87	.95	.95	.87	W by N.	E.	W N W	—	Chd. Slight r'n moon to 7 pm. Snowing	
5,	29,977	29,930	29,079	29,143	27.6	27.6	24.2	25.57	1.25	1.17	1.14	1.13	.81	.77	.85	.80	W by N.	W by N 1.0	W N W	—	8 to 11 pm.	
6,	29,211	29,260	—	29,260	26.0	28.4	—	—	1.26	1.90	—	—	.87	.75	—	.80	WNW 1.5	NNW 2.0	W N W	0.1	Gen chl. Slight snow 7 am to 3 pm.	
7,	29,561	29,589	—	29,560	21.6	26.6	18.8	—	0.95	1.12	0.87	0.92	.79	.77	.82	.78	NW 2.0	N.	N by E.	not ap	Chl. till 11 am. Rem. clear. Aurora!	
8,	29,495	29,671	29,766	29,766	19.5	27.4	25.7	25.7	0.95	1.16	1.13	1.09	.86	.76	.73	.85	N. by E.	E S E	Calm.	—	Light till 9 to midnight.	
9,	29,757	29,417	29,486	29,553	22.4	33.8	31.2	29.60	1.09	1.24	1.28	1.20	.87	.64	.79	.83	N. by W.	S S W. 3.0	NW by W	not ap	Overcast. Light passing clouds.	
10,	29,682	29,789	29,982	29,875	18.7	16.8	12.4	12.39	0.85	0.77	0.71	0.68	.81	.79	.86	.82	N by W 1.5	N. 1.5	N by E.	—	Gen clear. L't chds dispers. Parts of sn	
11,	30,117	30,063	30,010	30,056	0-2	14.4	12.8	10.88	0.44	0.50	0.63	0.57	.93	.56	.77	.74	N. N. E.	N E by E.	N. N. E.	—	Chl. except a few pt. chds occurs. Halo	
12,	30,023	30,021	30,039	29,938	13.8	25.0	14.7	20.53	0.72	0.94	0.85	0.91	.68	.82	.95	.79	N. N. E.	S. S. E.	Calm.	—	at 9 to 11 pm.	
13,	29,985	29,841	—	29,841	20.4	31.7	—	—	1.01	1.04	0.85	0.91	.68	.82	.95	.79	Calm.	S. S. E.	Calm.	—	Cloudy till noon. Ctr from 1 pm. Fine.	
14,	29,625	29,570	29,657	29,657	18.2	38.1	29.1	29.35	0.98	1.35	1.32	1.23	.94	.59	.81	.76	Calm.	N E by S.	Calm.	—	Gen overcast. Light clouds. Fine.	
15,	29,842	29,821	29,787	29,804	18.8	31.0	23.3	24.76	0.82	1.10	1.03	1.01	.78	.63	.79	.74	N. by W.	N E by N.	Calm.	—	Clear a few pt pass chds. Very fine	
16,	29,747	29,710	29,700	29,711	24.6	35.1	25.0	28.18	1.02	1.47	1.36	1.27	.74	.72	.92	.82	N. by W.	S E by S.	Calm.	—	Ctr. Aur light till 1 am. Very fine	
17,	29,698	29,738	29,800	29,761	20.7	35.4	29.2	27.83	1.07	1.55	1.34	1.29	.93	.74	.98	.83	Calm.	S E by E.	Calm.	—	Clear, save a few chds 5 to 9 am. Fine	
18,	29,846	29,783	29,724	29,757	20.8	36.7	29.2	30.83	0.99	1.43	1.60	1.41	.84	.66	.99	.82	E. by F.	S. E. E.	Calm.	—	Clear, save a few chds 1 to 5 am. Fine	
19,	29,600	29,434	29,306	29,355	31.1	37.4	37.4	36.26	1.63	1.70	1.51	1.62	.94	.77	.68	.76	E. by S.	E. by N.	E.	—	Clear & uncl'd. Very fine day.	
20,	28,957	28,897	—	28,897	35.9	41.2	—	—	2.01	2.17	—	—	.96	.95	—	.76	E. by S.	S. W.	E.	—	Ctr. till 4 am. Day chl. Slight rain 5 pm	
21,	29,356	29,558	29,619	29,547	36.4	46.6	36.0	38.02	1.47	1.83	1.52	1.45	.69	.41	.72	.65	W 1.5	W.	S W by S.	—	Densely overcast. Slight rain am.	
22,	29,601	29,468	29,470	29,518	31.0	36.4	32.0	33.89	1.58	1.98	1.71	1.75	.92	.93	.95	.91	Calm.	E.	Calm.	—	Part chl. Brilliant aurora 8 to 10 pm	
23,	29,588	29,677	29,761	29,715	29.3	33.2	26.6	29.97	1.47	1.35	1.31	1.28	.91	.71	.89	.78	W N W.	W N W.	W N W.	0.1*	Part of over. Slight rain from 2 to 6 pm	
24,	29,890	29,874	29,987	29,954	22.9	32.6	22.0	22.90	0.85	1.10	0.81	0.69	.67	.66	.67	.70	W N W.	NNW 1.0	N N W.	—	Slight snow 7 to 9 pm.	
25,	30,109	30,053	30,015	30,041	11.1	32.2	15.7	17.19	0.79	0.92	0.87	0.83	.76	.75	.93	.82	N. E.	S by E.	Calm.	—	Part chl. Aur light 9 & 10 pm	
26,	29,920	29,656	29,614	29,698	12.6	33.6	29.2	25.21	0.58	1.26	1.26	1.09	.83	.75	.77	.79	N. E.	S by W	N. W.	—	Aur pt 1 to 5 am. Mdy chl. Pass chds	
27,	29,645	29,666	—	29,666	25.5	30.0	—	—	1.20	1.44	—	—	.86	.85	—	.82	N. W.	E N E	Calm.	—	Uncl'd till 8 am. Rem of day mdy chl	
28,	29,467	29,165	29,173	29,242	28.0	35.4	31.0	29.88	1.20	1.82	1.52	1.43	.77	.58	.88	.85	S. S. E.	W S W	N by W.	—	Mostly clear. Passing clouds.	
29,	29,304	29,423	29,561	29,465	29.4	32.1	13.6	18.09	1.04	0.79	0.71	0.86	.91	.65	.82	.83	NW by W	NNW 2.5	Calm.	—	Den chl str 7 am to 2 pm & fr 8 to midn	
Mean	29,620	29,585	29,609	29,608	25.32	31.44	24.99	26.98	1.07	1.29	1.20	1.19	.84	.71	.85	.80	—	—	—	10.8	—	Snow squalls till 1 pm. Mdy chl fr 2 pm

Highest Barometer, 30.160 at 10 a.m. on 11th.
 Lowest do, 28.897 at 3 p.m. on 20th.
 Highest Temperature, 40.° on 21st, 3 pm
 Lowest do, 0° on 11th, at 7 a.m.
 Mean Max Therm., 33.05—Mean Min. Therm., 20.27.
 Mean Daily Range, 12.78
 Extreme Daily Range, 23.6 from 3 am to 5 pm on 25th.
 Warmest Hour, 2 pm, Mean temp., 32.01
 Coldest do, 7 am, Mean temp., 22.32
 Diifer., 9.69

Monthly Range 12.63
 Monthly Range 46.6
 Proportion of Wind from each Quarter—
 N.W. 1.67
 S.W. 66
 S.E. 66
 N.E. 108
 Total, 399
 Mean force of the Wind, 0.47 lbs per sq. ft.
 Maximum force, 6.6 lbs on 6th, at 8:30 pm
 Greatest Day's Wind, 23d.—Mean Force, 1.33 lbs.
 Least do, 3d. 0.03 lbs.

Temperature for February.
 Mean, 29.09
 Max, 60.39
 Min, -10.56
 Range, 60.88
 No. Days, 8
 Inches, 1.475
 Winds, 198
 Gales, 80
 Mean Day in, 9
 Dot per, 1.03
 3.625
 402
 33.4
 222
 330
 389
 201
 0.47
 1.05
 1.44
 7
 10.0
 9
 19.0
 13
 18
 27.5

Under the head of Tension of Vapour, is given the elastic force of the Atmosphere at each Observation, in decimals of an inch of Mercury, or the proportion of the Barometric pressure due to its presence.
 The Instruments are Standard Instruments. The Rain Gauge is 27 ft above the soil.—The Means entered are the Means by 24 hourly Observations, from 6 a.m. to 6 a.m.—The quantity of Rain received for the last 24 hours, is noted at 9 a.m.—The Observations entered at 7 a.m., on Sundays, are actually taken at 9 a.m., on Sundays, are not included in any of the means.
 MAGNETIC DISTURBANCES.—FEBRUARY 21st, 11h 00m, to 18h, very remarkable, the great deviation of the magnet being to the East. Easterly deviation, 29° 07'. Total range 3° 31'. 21st, 19h to 21h, slight, 23° 06' decl. 23d 16h, to 24h, 0h, (at intervals of 15m), slight, 89° 07' decl. 24th, 20h, to 25th, 0h, slight, 89° 3' decl.
 * Rain in inches on surface on the 6th, 0.410; 20th, 0.270; 21st, 0.020; 23d, 0.075—Total, 0.775.

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