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CANADA

MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

The Small-pox Epidemic in St. John, N. B., in 1871. By L. C. ALLISON, M.B. Read before the New Brunswick Medical Society, 3rd April, 1872.

MR. PRESIDENT AND GENTLEMEN,—There are no phenomena for which we find it harder to account than for the variations that constantly occur in the types of infectious diseases. One year a disease will appear in a particular locality, diffusing itself widely but causing few deaths and comparatively little suffering among those whom it attacks. It disappears—that is, it travels away to act in other places, for the infecting principle of such a disease being constantly transmitted from one person to another never dies out to be regenerated *de novo*, but merely alters its neighborhood and the area of its action. After a second interval it re-visits its former locality in a form so changed that it hardly seems to be the same thing. A large proportion of those who are attacked by it die, and many others escape only after a protracted and dangerous illness. The sanitary condition of the community and the general healthfulness of its inhabitants are no worse than they were before—perhaps they are better, and the infection is or ought to be the same, but the disease is very different. Last year it was not severe anywhere. This year, in every site or community it reaches; in every climate, hot or cold, moist or dry; in every neighbourhood, crowded or scattered, it exhibits the characters of intense malignity. Whence does it derive these characters? How is it that the same factors give a product in one year of four and in another of forty? We cannot tell. The question puzzles the most modern nosologists as hopelessly as it puzzled Sydenham.

The small pox of 1871 is one of these anomalous epidemics. I am not aware that its origin has, as yet, been definitely investigated; but, when this is done, I think it will be found that its

starting point was either in the beleaguered City of Paris or in the camp of the besieging army. Such epidemics are often traceable to the massing of large bodies of troops in field or in camp, and their appearance often follows at a short interval after the tidings of battles and sieges. It is probable that the small-pox of 1871 will prove to have been connected with the Franco-German campaign in the same manner in which the typhus epidemics of the early years of this century were connected with the wars that followed the French Revolution. But whether the disease acquired its virulence from germs of infection imported from beyond the channel or developed it by maturation at home, this much is certain, that during the last ten or twelve weeks of 1870, small-pox, of an unprecedentedly malignant type, began to show itself in London. It increased there, the deaths gradually rising from forty or fifty to two or three hundred per week, and gradually spread to some seventeen of the principal cities of the kingdom, in which, during the course of last year, it destroyed more than 13,000 people, and nearly 8,000 of them in London alone. Early in 1871 it spread westward along the principal commercial highways to New York and other new centres in North America, from which it extended itself, always travelling with the sun, until at the present date few of the larger cities of Canada and the United States are free from it. In England it seems now to be upon the decline, but a month or two ago it entered Scotland and became epidemic in Edinburgh. It will probably visit all the remaining sections of the United Kingdom before it takes its departure. Upon our side of the Atlantic it bids fair to extend across the whole breadth of the continent and renew in California the havoc of 1868. Such is a brief sketch of its geographical diffusion.

There are three points connected with the appearance of the disease in St. John to which I would like to call your attention, and these are: First, the peculiar circumstances under which the disease was introduced; secondly, the measures that were employed to check its spread; and thirdly, the peculiar character of type that it presented. And first, with regard to the

ORIGIN OF THE EPIDEMIC.

On the last day of the year 1870 a man named John W— came to St. John from Portland, Me., his history, so far as then known, being that of a sailor just landed and paid off from a long sea voyage, and wishing to spend a few days in diversion upon his way home to his friends upon the North Shore. He took lodgings in a small house near the end of Erin street, and within a stone's throw of the Marsh Bridge, where he remained about a

fortnight, "spreeing," as the phrase goes, among the ship carpenters and other pleasure-loving folks in whom the neighbourhood abounds. On the 14th January he felt indisposed, but not very severely, and kept to the house, trusting that the uneasy sensation would pass away. As he felt much worse next day medical assistance was sought from a physician who has kindly supplied me with the following particulars of the case:

Case I.—The messenger asked for medicine for a man who had lately been drinking and was then suffering from the symptoms that usually follow excesses of this kind, but chiefly complained of the vomiting. Bismuth was then prescribed, with milk and lime water, but no improvement having taken place, the doctor saw him on the following day (16th) and found him presenting the symptoms of a smart febricular attack, with incessant vomiting and pain referred to the epigastrium. Headache was present, but not very severe. All these symptoms were in perfect accordance with the previous history, and supported the diagnosis of an excess in drinking. The milk and bismuth were continued with the addition of a mustard poultice to the epigastrium. On the 17th the vomiting was relieved and the headache had gone, but a new and strange symptom had appeared—bleeding from the gums and from the respiratory mucous membrane. The blood expectorated was fresh and there was no physical sign of anything being wrong with the lung. A careful examination failed to elicit anything that could account for the mucous hæmorrhage except that during his maritime experience, which included a voyage of seventeen months' duration, the patient had suffered from a scorbutic attack. Constipation, which had previously existed, was checked by a purgative.

So far there had been nothing to excite apprehension or foreshadow the rapidly approaching catastrophe. But on the 17th January a startling change had taken place in the patient's condition. He was passing blood freely from all the mucous membranes, from two old cicatrices now broken down, from a recent scratch upon the face, and from one ear, the cuticle of which had begun to peel off in consequence of a recent frost-bite. The surface of the body was covered with ecchymotic spots, which were largest and best marked upon the limbs; those on the body being smaller and brighter in color. On the tongue these spots assumed the appearance of blood-blisters, which constituted the only elevation of surface that could be seen anywhere. The pulse was rapid, very soft and feeble, and the whole appearance was that of a man rapidly sinking from some form of malignant blood-poisoning. A consultation was held. Beef-tea and brandy were

freely administered, with the effect of somewhat raising the sinking pulse, but the improvement was slight and transitory, and between 9 and 10 p.m. the patient died.

During the last hours of the illness some facts came out that had previously been kept secret. After landing from his seventeen months' voyage, and being paid off at Queenstown, he had come out to Portland in the Allan steamship "Moravian," arriving on the 2d December. Four or five days previous to her arrival small-pox had broken out among the passengers, and the vessel had, in consequence, been quarantined and fumigated after the sick had been removed from her. One important part of the fumigation had been omitted, as I shall soon show, but this last fact was not known then. In the meantime there was nothing to attract much attention to the account or to lead the gentlemen concerned to suspect, for one moment, the nature of the horrible case they had just witnessed. The story did not appear to throw much light upon it. The vessel had been duly quarantined and fumigated, and the man had been more than *three weeks* away from her, leading all the while an active and vigorous life in the open air. Neither the symptoms of the illness nor the antecedent history favored the diagnosis of small-pox; but, taken together they appeared to preclude it. Small pox, without eruption, can be demonstrated only by tracing it to the infection of small-pox, or by tracing the infection of small-pox to it, and in this case the antecedent proof seemed to fail.

From the 23d December, the day on which W— left the "Moravian," to the 14th January, when he fell sick, twenty-three full days had elapsed, or more than three weeks. Now, of all zymotic diseases, small-pox is that which is most regular in the length of its period of incubation, which is never many hours less or more than thirteen days.* In W—'s case we must suppose either that we have the incubation lengthened by fully nine or ten days—an observation such as has never previously been recorded—or that he contracted the infection from his own clothes. We must inevitably come to the latter conclusion, for it is quite evident that the clothes of the "Moravian's" passengers were not thoroughly disinfected. Those which W— brought with him from the steamer retained the creases and the peculiar sea-smell in which they had been packed. The invariable period of incubation just mentioned will lead us to the day of his landing in St. John, as that upon which he received the infection. On that

* Marson in "Reynold's System of Medicine," i, p. 434-5. Barendsprung in "Amalen des Charite Kranken," xix, p. 103. The eleven cases infected by W— followed this rule exactly.

day, his long voyage being at an end, he must have taken off his sea-clothes, put on others which he took out of the trunk, and received the infection from the latter. Thus by a series of little circumstances, all perfectly natural if you will, but all beyond recognition by any human knowledge at the time of their occurrence, a disease of great malignity and infecting power obtained a footing in a neighborhood highly calculated to encourage its spread.

It could not but spread. The people who live about the Marsh Bridge are very sociable and gregarious in their habits, and at the time of which I speak very few of them were vaccinated. The family with whom W — lodged had their own visitors, and there were others who came to see the sick man. Punctually at the fortnight's end, the Board of Health were disagreeably surprised by being notified of the simultaneous appearance of eleven cases of small-pox, all situated within a few hundred yards of the unlucky house, and having a traceable connection with it. The infection was evidently virulent. Six of the cases were confluent, one copious, and only three discreet. The remaining case was hæmorrhagic, and as I have never seen a clinical description of this form of small-pox in print, I shall give the notes which were kindly furnished to me by the physician who attended it.

Case II.—29th January, 1871. In the morning I was asked to see John McE —, who was said to be suffering from febrile symptoms. Being engaged at the time I could not go, but sent him a febrifuge mixture. As he grew worse they sent for me again and I saw him. His skin was dry and hot; his pulse 84, full and bounding. There was intense pain in the back, and pain also in the forehead. He was very despondent and kept saying that he was going to have the same disease that W — had had, and to die in the same manner.* The bowels were constipated, the urine smoky and scanty. There was incessant vomiting and precordial pain. Gave him a dose of calomel and potash, and continued the febrifuge, which contained a diuretic and a diaphoretic, increasing the former ingredient. Ordered ice to be sucked to relieve the thirst, and a mustard poultice to be applied to the epigastrium and back. After the bowels had been relieved he was to take gr. xx of Dover's powder. He did so and passed a tolerably easy night. The vomiting ceased, but the thirst remained, and he still had great fear and depression. 28th January, A.M., pulse 84; skin moist; urine increased to perhaps $\frac{3}{4}$ xl, but still

* This poor fellow had been an intimate friend of W —'s, and had attended closely on him during his illness. The attending physician had not seen or heard anything of W —'s case.

dark colored, and looking as if it contained blood derived from the kidneys. On the back a mahogany-like discoloration, sprinkled with black spots, varying in size from that of a bean to that of a ten cent piece. There was no elevation of the cuticle, and I supposed the discoloration to be the effect of the mustard applied to a congested skin. Two o'clock—Continued the ice. Evening—The mahogany discoloration had spread over the whole surface of the body, still mixed with purpuric spots, larger in size, and, if anything, deeper in colour than those which had been previously observed. Urine decidedly bloody; pulse soft, quick and feeble. He continued despondent and comparing his case to W——'s. 30th January, at 7 A.M., he died.

In comparing his case with W——'s, you will notice in each the sthenic symptoms speedily replaced by those of depression, the purpuric blotches and mucous hæmorrhage following upon the cessation of the vomiting and epigastric pain, and the total absence of papules or of any attempt at eruption. Lumbar pain was present in one case but not in the other.

I shall next speak of the progress of the epidemic and of the measures that were adopted to check its spread.

The measures which the Board of Health adopted upon the appearance of the disease were as follows:

The doors of the infected houses were placarded, and all communication with the inmates was forbidden, save the visits of the medical attendant, of those whose own houses were infected, and of those appointed to bring the necessary provisions. These last were supplied at the public expense to such families as had not the means or credit to supply themselves. At a meeting of this Society, held upon the 31st January, it had been resolved to recommend that the Board of Health should appoint a physician to visit the sick, and should procure a temporary hospital to accommodate such as required it. Both these recommendations were forwarded to the Board of Health and attended to by that body. A physician was easily found, but in spite of what could be done nearly three weeks elapsed before a hospital could be obtained, during which interval the cases had increased to the number of about sixty, and the fright and clamor had arisen to a very discreditable pitch indeed. Small-pox at all times makes more or less stir in the community, but on this occasion the malignant type and high mortality of the disease, so different from what had been observed during any previous epidemic, excited the liveliest alarm, and the accidental circumstance of the physician first employed having been infected before he entered upon his duties, and consequently attacked before he had been long engaged in

them, added, in some measure, to the panic. I cannot say that the tone adopted by the public press made matters any better. From an early period our editorial friends had made up their minds to insist upon three demands, which the authorities concerned, as I think, with very proper firmness refused to grant. These were : first, that the names and residences of the sick should be published ; secondly, that the Board of Health should submit the details of its proceedings for public criticism ; and thirdly, that the patients in the City Hospital should be removed to the Alms House, and the former building converted, for the occasion, into a small-pox hospital ; or, according to the elegant phrase then current, a " pest house." These demands were steadily resisted. The first concession would have increased concealments, and so helped to spread the disease for the mere gratification of an idle curiosity. The second would have subjected the Board of Health to the dictation of the public, which is exactly the reverse of what the mutual relations of these two ought to be, if such a Board is to be of any use. With regard to the dispute between the public press and the Hospital Commissioners, I think that the press was decidedly wrong upon that point also. No unprejudiced person, who knows anything of the matters referred to, can doubt the propriety of providing separate hospital accommodation for infectious and non-infectious ailments, or suppose that a costly institution, supported by a permanent tax, was set up for the accommodation of diseases which do not appear amongst us as often as once in ten years. Those who wish to see a full statement of the reasons upon which the Hospital Commissioners grounded their refusal to admit the small-pox cases, will find it in an able report which these gentlemen presented to the County Sessions on the 15th of last April. It will be sufficient here to say that an arrangement was finally made with the Directors of the Female Reform Society, by which the Board of Health obtained the temporary use of their building for a small-pox hospital. Possession was given upon the 20th February.

It was generally believed at the time that if the first set of cases reported had been removed into a hospital at once, the disease would have been stayed. I am quite confident that it would not. There were then four-and-twenty other cases in progress of incubation, and had the course recommended been followed, nearly all these cases would have been concealed, and the cases infected by them would also have been hidden until the number of the sick had become so great that no hospital would hold them. It would be far better to let isolation take care of itself altogether than, by a series of indiscriminate removals, to

bring about such a state of matters as this. A state of warfare between the infected families and the rest of the public. At that time, however, the public mind was possessed by exaggerated ideas of the extent to which a hospital could be made useful, as a means of checking the spread of small-pox. Of course we all know that there is but one certain method of effecting this desirable end, and that is *vaccination*. Attend to it carefully and you will arrest the diffusion of the disease, no matter how numerous and widely scattered the centres of infection may be. Neglect it, and two or three cases will be sufficient to poison a whole community with infection, in spite of every other sanitary precaution that you can adopt. The popular theory seems to be that, having once obtained an hospital, you can easily put an end to your epidemic by removing to it—*vi et armis*, if necessary—every case of the disease that shows itself. I need scarcely say that this is a fallacy, and that any attempt to stop an epidemic after this fashion will only lead to worse mischief. You will never be able to collect all the infection within the walls of your hospital; but, this is not the chief objection to the plan. Once let the people thoroughly understand what you mean to do, and every case will be hidden until it has done mischief enough to render its removal a matter of comparatively little moment. It must not be forgotten that the chief object of hospitals for infectious diseases is not to protect healthy people, but to accommodate a certain class of the sick, whom it would be impossible, or very inconvenient, to take care of elsewhere. A servant in a family; a lodger in a boarding house; any person who cannot get friends to take proper care and keep proper quarantine of him where he lives, if attacked by such a disease, must go to an hospital, and there certainly ought to be an hospital (and a separate hospital) for him to go to. There are also cases in which it is very advisable that a member of a family should go. A poor man who, even under ordinary circumstances, lives pretty near the edge of his income, cannot keep a case of small-pox in his family without making up his mind to undergo much hardship and suffering. He has no money, but he must give up all his employment. His neighbors are not always charitably inclined, but if they should be so, they cannot visit him to relieve his necessities. His house is small and he cannot isolate the sick person or prevent the disease from more or less endangering every member of his family. Some persons will prefer facing all these hardships and others, *quæ nunc lingue*, to parting with their relatives; but, they should never be able to say that such a terrible situation was thrust upon them by the negligence of the authorities. Moreover, under some circumstances we are justified

in resorting to removal, irrespective of personal considerations. When a solitary case appears, surrounded by a crowded, uncleanly, unvaccinated and ignorant population, it is wise and proper to remove that case and whatever may follow it, as long as by so doing you can keep the neighborhood clear of infection. By following this rule during the last epidemic the northern, southern and south-eastern portions of the city were kept clear of the disease until sufficient time had been gained to allow the vaccinators to go over the whole community. After this had been done no further forcible removals were made, for the only circumstances that would justify them had ceased to exist. It is highly necessary that the authorities should have the power of forcible removal, but the useful and necessary power must not be employed indiscriminately or it will become, to the public, a source of danger instead of an instrument of safety. In all cases where people (after thoroughly understanding what the consequences will be) prefer to keep their relatives with them, it is both cruel and unwise to force them away, unless you feel satisfied that the disease will spread beyond the family if they remain, and disappear altogether from the neighborhood if they go.

I trust, gentlemen, that you will not consider these few remarks upon the function of small-pox hospitals misplaced or superfluous. Very different views from those which I have just been stating, found favor with the public last year. They were loudly pressed upon the authorities by some of the public prints, and claimed to be supported, to a certain extent, by medical opinion.

The measures which the Board of Health adopted for quarantining and disinfecting the infected houses have often been sneered at as inadequate. They are not perfectly protective, and, indeed, no human measure can be, yet they evidently produced some good effect. The district in which the disease first appeared, and to which it was kept chiefly confined, is bounded by Brunswick street and by portions of Erin and Brussels streets. It presents many obstacles to the enforcement of any kind of sanitary regulations, and contains, for its size, a good many inhabitants, very few of whom, at that time, either were vaccinated or wished to be. Up to the middle of March I kept finding unvaccinated people in it who had been living, week after week, within a very short distance of the infection, before it found an entrance into their houses. Notwithstanding all sorts of local furtherances, the disease, even in this infected district spread but very slowly from one house to another, and never became localized anywhere else, although solitary cases appeared at intervals in almost every part of the city. Clearly, McBurns, with his placards and fumigations,

played no contemptible part in suppressing the epidemic. But, the most careful attention paid to infected houses, coupled with the most judicious series of removals to hospital, could not have eradicated the disease, had it not been for the district vaccinators.

As early as the 2nd February, the Chairman of the Board of Health had written to the editor of the *Morning Telegraph*, a letter, in which he dwelt upon the impossibility of using the public infirmary as a small-pox hospital; the hopelessness of expecting to extirpate the disease through the medium of any hospital, and the pressing necessity of attending to private vaccination. This last piece of advice was much needed, for, as it afterwards turned out, there were then in the city more than 6,000 unprotected people, or about one-fifth of the entire population.* The necessity for a public vaccination soon became apparent and pressing. Owing to various causes, the chief of which was the absence of a compulsory vaccination law—a defect which, I regret to say, still remains unremedied—there was a great scarcity of lymph in the city. Moreover, there are, in every large community, a certain class of the people who will not look after their own protection as they are influenced by a dread of vaccination, the combined result of ignorance and quackery, which nothing short of the fear of imminent death can overcome. Lastly, the poorer people, who need vaccination most of all, can never be properly attended to by private practitioners. In view of all these considerations a public vaccination was instituted, and to this wise and prudent measure we owe the speedy extinction of the disease that followed. Without it we might have been, at this present moment, sharing the fate of many large cities of Europe and America, which have had the disease domesticated among them for many months, with lamentable waste both of life and public and private expenditure.

The city was divided into ten districts, and, to each of these was appointed a physician to inspect its inhabitants and vaccinate or re-vaccinate such of them as he might find unprotected. The undertaking was commenced upon the 3rd March, and completed in the course of a few weeks, 5,379 people being vaccinated, or re-vaccinated, at a cost to the public of a little over sixteen hundred dollars. Never was public money better invested.

The new cases which, in February and March, had been occurring at the rate of two or three a day, declined, in April, to three or four a week, and by the third week in May the disease had

* Between 10th February and 19th May there were vaccinated or re-vaccinated: By the District Vaccinators, 5,379; at the Board of Health office, 875. Total, 6,254. Besides what was done in private practice, and what Dr. Holden and myself did among the infected families and their neighbors.

almost disappeared from the city, but at that date it received, from three concealed cases, an impetus that one might call a second epidemic. Eighteen or twenty new cases appeared, nearly all unvaccinated people, who had either lately arrived from the country or been accidentally overlooked in the district visitations. The disease had lost none of its malignancy. Two of the cases were hæmorrhagic and two petechial, and seven, or more than a third of the whole number, died. The fact that all this mischief arose from three concealments shows what a dangerous thing concealment is, and how strenuously we ought to avoid anything that may tend to encourage it. The new outbreak thoroughly tested the efficacy of the district vaccinations, for I believe it infected every unprotected person that was to be found within a large radius from the site of its appearance. It was dealt with in the manner that I have already described. By the end of June the city was clear of small-pox and it has since remained so.

I may here say a word or two upon the subject of

THE SMALL-POX HOSPITAL.

Irrespective of other recompense, the public owes its thanks to the Directors of the Female Reform Society for affording it the use of the Home, which, as regards site and internal conveniences, is, I believe, the best building in the city that could have been procured for the purposes desired. I make this acknowledgement all the more cheerfully because, at the time when we most needed co-operation and good will, it was almost impossible to hire anything for the use of the sick. Whatever we wanted we could only have by buying it altogether, and, cramped as we were for funds, this was a serious inconvenience. I have already mentioned that there was some unavoidable delay in getting possession of the building, but when it was finally handed over to me in a very unfurnished state, the cordial co-operation of Dr. Bayard and the Hospital Commissioners enabled me, in the course of a few hours, to fit it up for the accommodation of some eight or ten patients who were all that then required removal. We were soon ready to receive about eighteen more, or eight and twenty in all, had circumstances required it, but the actual number in hospital at one time never exceeded fourteen, exclusive of a matron, two men servants, and a female nurse, all permanently employed by the Board of Health. Besides these we had other assistance. Certain relatives of the sick who were properly protected, were allowed to enter the hospital and attend upon them if they wished it, on condition of assisting, if required, to look after the other patients, without demanding any wages beyond their board and lodging,

and leaving the hospital with the patients that they had accompanied thither. The plan seemed to work very well, and we had always one or two of these volunteer nurses on hand. If I thought it would please any of them to have their names mentioned I could do so, and commend their kindness and diligence as well. Neither were the permanent servants wanting in these respects. The food and all the other supplies were good, and to shorten a long story, if I had been taken sick I would have gone there myself. I mention all these things because within three days after the hospital had been opened it was asserted in public print, not only that the place was ill-provided and ill-managed, but that the sick within its walls were treated with gross inhumanity. I contradicted these statements at once, but they produced a bad effect. Up to the 23rd February, the date at which they were published, I had not met with a single concealment. In the course of the week immediately following I found *nine*. All this shows how careful the press ought to be in seasons of public panic, and furnishes an excellent commentary upon the popular notion of combating the disease through the medium of the hospitals.

I have now, gentlemen, explained to you the plan which was adopted in dealing with the disease, and the results which followed it. The plan, I think, was sound and the result good, but I leave them both to your criticism. I hope that the details have not been tedious. I have judged it necessary to go into them because their expediency was much questioned at the time, and may, perhaps, be doubted still, a fact which, at least, ought not to be due to a want of proper explanation. That explanation, which for obvious reasons could not be given then, I think it only right to give now. And before leaving this part of the subject, I shall not be deterred, by any fear of misconstruction, from offering a small tribute of approbation to our worthy ex-President of the Board of Health. I have no private interests to serve with that gentleman. I have not even acquainted him with the fact that I intended, upon this occasion, to make use of his name, lest his modesty should have shrunk from even this small acknowledgment of the very great services for which the public is indebted to him. I am not about to allude to his merits as a private gentleman or as a medical practitioner, which have long been recognized both in the profession and outside of it. It is only of his public actions that I am free to speak; of valuable services long and cheerfully rendered to the public, in posts whose only salary is the consciousness of being useful, in the face of all manner of personal annoyances, both great and paltry; of an hospital

established for the poor, and defended for them against the clumsy manipulations of shallow municipal economists; of the lives of citizens preserved; of a man's duty manfully done, with the sacrifice of all personal and selfish considerations, and in despite of that great modern bugbear of popular clamour which has so often driven incompetent officials to mischief. It is an invidious action for a junior practitioner to pass an opinion upon the conduct of a senior, but the fear of personal misrepresentation shall never deter me from doing an act of justice.

CHARACTER OF THE EPIDEMIC.

I have now to lay before you some of the statistics of the epidemic. The cases, so far as made known to the Board of Health, were 205 in all; 98 males and 107 females. Of these, 32 males and 39 females died; 71 in all, or nearly 34 per cent. of the whole number attacked. This heavy mortality was chiefly due to three circumstances, each of which claims a word or two for itself. 1st, The neglect of vaccination; 2nd, The large proportion of those who were attacked during the early months of life; and 3rd, The great malignity which has everywhere characterised the epidemic of 1871.

1st. *Neglect of Vaccination* in every small-pox epidemic is the chief cause of both the extension of the disease and its fatality. I need not waste time in dwelling upon truths which have been ten thousand times told, and fifty thousand times demonstrated during the past eighty years, although it seems that there are some people who can never be induced to realize them. No epidemic could confirm them more forcibly than that of which I am now speaking. Of 138 unvaccinated people who took the disease here last year, only one escaped with a varioloid attack, and 69, or just half of them, died; twenty-five, or not far from half of these, again, had either hæmorrhagic small-pox, which is invariably and speedily fatal, or the petechial form, which, though a little more protracted in duration, is hardly less deadly. All the rest, except some eight or nine, had confluent or copious eruptions which, even in epidemics of the ordinary type, prove fatal to a full third of those who exhibit them. On the other hand, 67 vaccinated people took the disease, and 30, or nearly half of them got off with varioloid attacks: Only *two* of them died, or about 3 per cent., which is just the usual mortality of small-pox after vaccination. This furnishes us with an important addition to the argument in favour of vaccination, which I have not found dwelt upon as strongly as it deserves to be by any of our authorities, i.e., that *the malignancy of the epidemic does not*

raise the percentage of mortality amongst the vaccinated. While the mortality from the natural disease, never lower than 12 or 15 per cent, may be swelled to 50 per cent. and upwards, by an increase of malignity in the type of the epidemic; small-pox, after vaccination, is, on the contrary, an uniformly mild disease, and attended with an uniformly low rate of mortality, whatever the type of the epidemic may be. I have already shown you how the district vaccinations extinguished the disease among us in less than three months. I wish that these facts could be carefully considered by all who have any lingering doubt in their minds that there is but one method, and that, happily, an infallible method, of dealing with that formidable and loathsome disease; or, who think that any amount of squabbling about "isolation" and "the liberty of the subject" will enable us to avoid the necessity for a stringent Vaccination Act. I have seen people, protected by vaccination only, come out unharmed, after living for weeks together in atmospheres of which the inhalation by the unprotected was certain infection and probable death. I have known vaccination resist all these influences, and that of accidental inoculations as well. In the face of all that I could tell you upon this point, and all that you know yourselves, it does seem a most reprehensible thing that our Legislature should have buried the Vaccination Act that we sent them last year, because they could not decide whether the vaccinators ought to have five cents or fifty cents per head for their vaccinations, or whether they ought to be ordered to perform them for nothing. I hope that this matter will be kept before the public, and not suffered to fall into oblivion until another epidemic calls attention to it in the same melancholy manner as that of last year.

With regard to the *Ages of the Patients*, thirty-five, or rather more than one-sixth of those attacked, were under five years of age, and only three were less than a year old—a circumstance which could not fail to add to the mortality. In treating these little people we thought ourselves uncommonly fortunate to save three out of the nine and sixteen out of the thirty-five. The youngest patient was the child of an infected mother, at the full time, and was born jaundiced. It was vaccinated at once, but seven days after birth it showed the eruption of confluent small-pox, and died five days afterwards. Another female infant showed a copious eruption on the tenth day after birth, in spite of an ineffectual attempt that had been made to save it by vaccination. The vaccine vesicles, two in number, ran their course along with the eruption, and though they did not modify its maturation, I am inclined to think that they may have lessened its amount and

in some measure mitigated the secondary fever, for this infant lived longer than any other fatal case, and at one time I almost indulged the hope that it would recover. It died on the twentieth day exhausted and with paralysis of the soft palate and œsophagus.

A child, four years of age, was apparently well and hearty two days after small-pox had appeared in the family. On the third day, about six p.m., it suddenly sickened, complaining of pains which it could not precisely localize, and laid down. It sank rapidly and died in about four hours. I could not get down to see it during life. The body presented no characteristic external appearances, and I had not then time to make a post-mortem examination, nor do I think that the parents would have permitted one. In such a case the cause of death must remain an open question, but I returned it as a death from small-pox, having little doubt that the infection had proved sufficiently powerful to cut off the child before any special symptoms could be developed. If this were so it is the most rapidly fatal case upon my list. The youngest patient that recovered was two and a half months old, and had varioloid; but another male infant, aged fourteen months, recovered from a confluent attack, followed by an abscess in the zygomatic fossa, which retarded his convalescence by several days. It is seldom that we have to record such a fact, or notice the appearance of small-pox pits upon so young a face.

The two oldest patients attacked were two men, aged respectively sixty and sixty-seven; both of whom had the hæmorrhagic form and died within three days. Three women, aged sixty, sixty-five, and fifty-seven, recovered; the first two from varioloid and the third from the form called "horn-pox," the only case that I have ever seen. The eruption remained papular and took nearly forty days to disappear. The accompanying fever was quite moderate.

To conclude with regard to age, you will see by the accompanying table,* that the lowest death rate—28 per cent.—was met with between the ages of five and twenty.

3rd. The *Malignity of the Epidemic* has been noted during the last two years in every locality where the epidemic has shown itself. It is evinced in the large number of hæmorrhagic and petechial cases, both of which are usually great rarities; in the copious amount and unfavorable character of the eruptions, and the comparatively unfrequent occurrence of the milder form of small-pox among the unvaccinated; in the severity of both the initiatory and suppurative fevers; the large number of deaths,

* [This will appear in the next number of the journal.—Eds. C. M. J.]

and the early period at which they occur. This last point is worthy of special notice. Gregory, averaging from a very large experience, found the eighth or ninth day after the eruption, *i.e.*, the eleventh or twelfth day of the disease, to be the most fatal, and Wood says that most deaths occur between the twelfth and eighteenth days, or, roughly speaking, within the third week of the disease. By the accompanying table of the duration of the fatal cases that occurred here last year you will see that twenty-six, or more than a third, died before the fifth day, only seventeen survived the tenth, only one lived beyond the nineteenth, and that the average duration of the whole seventy-one cases was but seven days and a fraction.

The same virulence has characterized the disease in other places. Last year, in England, where they have a Vaccination Act which, however imperfect, protects thousands of the population, small-pox destroyed, in seventeen large towns, 13,174 people, including 7,876 in London alone; while the average mortality among the unprotected has varied from about 40 per cent. to more than two-thirds. It has sometimes been observed that the virulence of small-pox epidemics abates after the first month or two. In our half year there was no such abatement, the virulence remained unaltered to the last. The last who were attacked suffered as severely as the first, and of the last six deaths recorded, one died on the second, another on the third and two on the fifth days.

I have to add a few remarks upon the different forms of small-pox that were observed, and their treatment.

HÆMORRHAGIC SMALL-POX.

I have failed to find an exact description of this form of the disease in any of our standard authorities. Aitken says nothing of it. Trousseau speaks of two patients "whose bodies looked as though they had been rubbed over with the juice of mulberries or the dregs of port wine." Sydenham, whose opportunities for observation of the malignant varieties of small-pox were ample and well used, gives a very good description of the petechial form, noticing its frequent association with the symptoms of bloody urine, but is not explicit as to true hæmorrhagic small-pox. The only good accounts of the latter that I have found are those of Gregory and Marson, who describe the mucous hæmorrhages and vibices, and mention the fact, the importance of which we have already seen illustrated, that even in the adult this form may give rise to uncertainty in the diagnosis by proving fatal before the eruption has had time to appear. But they agree in stating that it generally proves fatal upon the fifth day of the eruption—

i.e., the seventh or eighth day of the disease. I do not know from what number of cases they took this average, but the eleven cases that we saw here were closely alike in their symptoms, and not one of them presented anything that could be called an eruption at all, while in only one of them, and that a peculiar one (of which I shall shortly speak again), was death deferred beyond the third day. In short, as I have already said, this form of small-pox has no symptom in common with any other, and its identity can be shown only by tracing the cause which produced it and the effects which it produces. From the observations of these ten cases I would describe it as follows :

It results from the action of a very malignant virus working upon an unprotected subject, and seems to require, also, the pre-existence of some debilitated state of the constitution. It commences with a smart febricular attack. Mental depression may or may not be present from the beginning, but the first symptoms are always of a sthenic kind. The pulse is hard and quick. The most distressing symptoms are headache and vomiting. The former is frontal and usually very severe; it is rarely relieved before the first symptoms of sinking appear, and always lasts longer than the vomiting. The latter is severe—sometimes almost continuous, always frequent and associated with epigastric pain, almost as if some irritant poison had been received into the stomach. The heat of the surface at this time will attract special attention; it is, I believe, greater than that which attends on the commencement of any other disease. I regret that I had not an opportunity of instituting a proper set of thermometrical observations upon this point, but, judging roughly from the sensation communicated to the hand, I would estimate it at not less than 108° or 110° . On the second day these sthenic symptoms subside into those of great mental and physical depression. The vomiting stops and is at once succeeded by the formidable and, I would say, fatal symptom of mucous and subcutaneous hæmorrhages. In the cases which I saw these extravasations occurred first in the conjunctiva and in the urinary and intestinal mucous membranes; these soon give way and exude blood which is dark coloured and forms but a loose and scanty coagulum. The natural secretions of the membranes first become tinged and then deeply coloured by this dark blood, and finally almost wholly replaced by it. Superficially the extravasations take place in the subcutaneous cellular tissue, and are also infiltrated into the substance of the derma, giving rise to the appearance of the dark-red patches and blotches which Trousseau has likened in colour to the lees of port wine. These patches may be associated with large and numerous petechiæ, but the cutaneous

appearances are not invariable; either patches or petechiæ may be present alone, or the skin may merely present a diffuse, brawny swelling, somewhat heightened from the natural colour. An ulcer is sure to become the seat of hæmorrhage; a cicatrix or a recent scratch will probable bleed also. Anything that renders the capillary circulation especially active, at a particular point, tends to cause hæmorrhage from it. The patient sinks on the third day.

There is another form of small-pox closely related to this, but attended by an eruption, and differing somewhat in the intensity and duration of its symptoms—the

PETECHIAL SMALL-POX.

Here the premonitory fever is of an asthenic type from the first, and on the second and third days there is a strong tendency to mucous hæmorrhage, especially from the gums and kidneys. Numerous petechiæ appear, and are soon followed by the eruption, whose papules, instead of being small and acuminate, are large, broad and flat, and of a dark purplish-red colour. If the patient survives long enough they become flat, confluent vesicles, irregularly shaped and dotted with small black umbilici, as in the bad, confluent forms of which, indeed, this is the worst kind, the patient usually dying on the fifth or seventh day of the eruption. Sydenham dwells upon the prognostic value of *colour* in small-pox eruptions, a point which modern authorities have disregarded, I don't know why. In this respect the favourable eruption differs most markedly from the malignant one at every stage. In the former, the papules are bright red, the vesicles pearly and translucent, the pustules yellowish white or bright yellow, and the crusts a decidedly reddish brown. In the latter, the papules are purple or claret-coloured, the vesicles an opaque, dirty white, the pustules dark brown, and the crusts (if the patient lives long enough to form them) almost black. The petechial small-pox is closely related to the hæmorrhagic form, which I have just described, but as the latter has well-marked characters of its own, especially that of being an essentially non-eruptive form, I would class the former with confluent small-pox, between which and the hæmorrhagic variety it forms a sort of connecting link. Petechiæ and bloody vesicles are not absolute criteria, but only indices of malignity. When the type of the epidemic is virulent we may see them sometimes present in small size and number even in the company of discrete or moderate eruptions. Their value in diagnosis and prognosis is not absolute but comparative. Yet, when they are at all numerous or large, and precede a dark-coloured flat eruption, attended by vibices, hæmorrhage from the gums, or bloody urine, the case will almost certainly prove fatal, and when the vibices are large and the

hæmorrhages free, the result will seldom be delayed beyond the third or fourth day from the commencement of the attack. When the petechiæ are less numerous, the papules somewhat larger, and the hæmorrhage not so free, the case may last a few days longer, and the eruption advance through some of its stages before death occurs. To sum up with regard to malignant small-pox: There are two distinct forms; one characterized by hæmorrhages without eruption, the other by petechiæ with a dark-coloured eruption which tends to become confluent if developed; but these two forms are closely related to each other, and may, in individual cases, be found, to a certain extent, combined—the hæmorrhages associated with a certain number of petechiæ, or the petechial eruption with a certain amount of mucous hæmorrhage. Both are, so far as I know, inevitably fatal. I saw one hæmorrhagic case in which life was prolonged for ten days, and in one very anomalous case of small-pox, after vaccination, which recovered easily and quickly, there were scarcely any symptoms beside the eruption, which consisted of varioloid papules associated with numerous and well-marked petechiæ on the legs and arms. But such cases must be very exceptional.

(To be continued.)

Proceedings of Societies.

MEDICO-CHIRURGICAL SOCIETY OF MONTREAL.

MEETING HELD APRIL 20TH, 1872.

The Society met in their rooms, the President, Hector Peltier, Esq., M.D.Ed., in the chair. After preliminary business, E. H. TRENHOLME, M.D., read the following paper on *Irregular Uterine Contraction*.

The subject of this paper is of such practical importance that I have thought it might not be uninteresting to briefly bring it before you. Observation alone can satisfy each one as to the accuracy of what is stated, and now that the subject is taken up I hope that it will be thoroughly and impartially investigated by you all.

Spasmodic contraction of the uterus is naturally divided into *irregular* contraction during the birth of the child, and *irregular* contraction during the delivery of the placenta.

1st. Irregular contraction of the uterus, during the expulsion of the fœtus, is known by short partial spasms of the uterine walls, which accomplish but little in the way of dilating the os or advancing labor.

These contractions do not occur regularly, either in respect to the space of time intervening between their return or their duration. By placing the hand upon the abdomen, over the uterus, we can frequently detect irregular and partial contraction of the organ. These pains are of a short, sharp and painful character, and usually cause intense anxiety and distress to the patient.

Upon making a vaginal examination you will detect but slight bulging of the membranes during the pains; also, not unfrequently an unequal dilatation of the muscular layers of the os or cervix uteri. The internal layer is the least dilated; sometimes to not more than half the extent of the external layer. By the way, I may say that the diagnosis of this condition is not so easy as one would naturally suppose, as the internal layer of muscular fibres is thin and might be mistaken for a thickened decidua.

When the finger has reached the os and is attempted to be passed between the neck and the membranes, we encounter adhesions more or less firm and extensive between the internal surface of the muscles and the decidua.

When the adhesions are on one side the os is drawn away from the median line and toward that side to which the decidua adheres. As a necessary consequence of such a condition of things, there are obliquity of the womb and irregular oblique presentation of the presenting part at the brim of the pelvis, and retarded engagement and its consequent results.

The existence of these adhesions are ascertained with little difficulty, for, in addition to the facts already mentioned, we have palpable and ocular demonstration of the attachment of shreds of muscular fibre to the decidua. In these cases the membranes are felt to be thickened, and with a little attention this thickening is recognized as due to shreds of muscular fibre adhering to the surface. I have on several occasions removed, by my finger nails, portions of these shreds from the decidua, both during the dilatation of the os and after the removal of the placenta, and found them composed of fibrillae of unstriped muscular tissue. (*See plate.*)

The adhesions are also recognised by this additional fact, that after such adhesions have been broken up by the finger, the protruding portion of the membranes rapidly increases in size; the uterus, which was before oblique, soon returns to its central position; the presenting part engages; the irregular, ineffective, spasmodic contractions become regular and powerfully expulsive; and a tedious, lingering labor becomes a normal one, and is speedily brought to a satisfactory conclusion. I have but little doubt more correct and extensive observation will demonstrate that the great

majority of oblique presentations will be found to be due to this cause.

The manner in which these abnormal adhesions are produced, and their *modus operandi* in causing irregular spasmodic contractions of the uterus, and its consequent results, will now be considered. In speaking of this matter we can arrive at probable conclusions only, and I shall therefore submit that these adhesions may be due to:

1st. A pathological condition of the inner surface of the uterus, existing previous to gestation; or,

2nd. To injuries received during gestation; or,

3rd. Result from partial, instead of complete separation of the decidua having taken place before term, *i.e.*, that the ripening of the decidua has not been uniform; or,

4th. To a combination of two or more of these causes.

We will now consider the value of these different hypotheses.

1st. In favour of the idea that these adhesions may be due to a diseased state of the internal surface of the uterus, existing previous to gestation, we have the well-established fact, that a part or tissue once the seat of disease or injury, seldom or never regains its original state of perfect health, and is liable to subsequent diseased action. Experience teaches us to be careful in effecting the delivery of the placenta in those cases where we have encountered strong adhesions in a previous labour, as we know that those who have been troubled with such adhesions are obnoxious to them on subsequent occasions.

2nd. Adhesions may occur during gestation as a result of local extravasation of blood, or liq-sanguinis; either from shock; a plethoric state of the system in general, and the uterus in particular; or, by direct violence applied over the parts affected, as by a blow upon the abdomen; or, possibly, by injury to some part of the neck or lower segment of the uterus, upon the brim of the upper strait of the pelvis. Such an injury as this might be caused by a false step, jump, or fall. For my own part, I am of opinion that this is a not uncommon cause of such adhesions. This view is confirmed by the fact that in most of the cases of retarded labour, due to irregular uterine contraction, that I have met with, the adhesions were situated within a short distance of the os.

3rd. The adhesions may be due to partial ripening or want of that cell maturation, by means of which the decidua is separated from the internal surface of the womb at term in natural labour, and which, by the way, is, in all probability, the determining cause of

labour, as lately suggested by the present Professor of Midwifery in Edinburgh—Dr. Alexander Simpson.

The strength of the attachment will determine the extent of the irregular contractions, and consequent delay, &c., in parturition.

The induction of labor at all, where adhesions exist, is probably due to the separation already spoken of having taken place, to a sufficient extent to produce uterine irritation and subsequent muscular contraction of the uterus. In this class of cases we need not look for, or suppose a pathological state of the membranes or uterine surface, but regard it simply as due to a lack of that perfected developement of the mucous membrane of the uterus, which is usually accomplished about the end of the ninth month.

4th. Lastly, these adhesions may be the result of two or more of the foregoing causes. There may be a predisposing plethora of the vascular system, accompanied by shock or blows; or, a weakened state of the uterine walls, the result of former disease or injury, and this, by a subsequent injury, may be the cause of local inflammation, effusion of plastic lymph, and subsequent adhesions.

The causes of these adhesions having been spoken of, we will now look at the manner in which they probably cause irregular spasmodic contractions of the uterus and retard labour.

The fault may be in the nerves or in the muscular structure.

1st. The nerves may be at fault, *i.e.*, there may be hypersthesia of some branches of nerves, thus inducing hasty, irregular action; or, there may be paralysis of some of the nerves which supply to the parts, and thus occasion irregular muscular action; or,

2nd. The cause of the spasm may lie in some abnormal condition of the muscular tissue, apart from any fault in the nerves; or,

3rd. The cause may be adhesions between the decidua and the uterus. Thus the decidua, being closely applied to the muscular surface and the adhesions preventing the membranes from protruding, might act in a mechanical way and thereby check the shortening of the muscular fibre, the attempt at contraction being met by the counter extension of the decidua; or, perhaps, the muscular structure, connected at the points of adhesion, may, by being lacerated or irritated during the pains, cause unequal and undue tension of some muscular fibres, the parts injured acting as direct excitants, and in this manner causing that unequal, short, spasmodic form of uterine contraction which characterizes tedious labour.

Of these hypotheses I am inclined to think that the last is most probably the correct one.

I suppose it will be conceded by every one that the whole uterus responds equally and regularly to the stimulus that induces labour,

unless there is some abnormal condition of the organ, such as defective innervation, excessive innervation, or muscular change of some part of the organ, as already mentioned.

As to defective innervation I shall not speak. The fact that these kinds of labour occur with women who both before and afterward have natural labour, shows that it cannot be due to disease of the nerves or muscles of the uterus.

Where one good and sufficient cause for the production of any phenomenon is known to exist there is no need to go beyond it, and recognized tension and laceration of the inner layer of muscular fibres, at the points of adhesion, are enough to account for irregular action of the uterus. The effect of these adhesions when they exist, say on the right side and near to the os, is to interfere with the regular action of the muscular contractions, for the reasons already mentioned, and at the same time cause a very incomplete and imperfect expulsive effort. The steady, protracted bearing-down pains, so desiderated, are wanting, and grinding pains take their place. We all know that the decidua, with its contents must be elongated, in order to adapt itself to the diminished capacity of the uterine cavity during the spasm, that the waters must escape, or the membranes be protruded through the os and a pouch of fluid occupy the vagina before any progress is made toward the delivery of the child.

This being the case, lateral adhesions must interfere with the descent of the membranes and cause that the bag of waters be formed at the expense of the membranes which slip down from the side where there are no adhesions. The formation of this pouch in this manner, in its turn, necessarily, carries the lower segment of the uterus with the os, toward the side on which the adhesions exist.

Thus in a first vertex or breech presentation of this kind the left side of the presenting part would be driven into the cavity of the pelvis and made to occupy a lower level than the corresponding parts on the opposite side.

The expulsive force of the uterine effort is lost to a great extent, on account of the fœtus not being made to engage in the axis of the brim of the pelvis. When we consider the irregularity of the contractions, and the great disadvantages under which the expulsion of the fœtus has to take place, we find abundant cause, not only for the prolongation of the labour, but also for the anxious and exhausted state of the patient herself. The labour pains in these cases are most severe, and this, in my opinion, is due to the muscles acting contrary to each other and tearing themselves

asunder, as has been already mentioned, when speaking of the unequal dilatation of the os.

It is this form of pains that most authors recommend to be treated by bleeding, when the patient is plethoric, and when weak and nervous by tepid baths, warm injections, sedatives, opium, Belladonna, &c.

The irregularity of the contractions continue till the adhesions are separated; or the dilatation of the neck has been slowly and painfully accomplished by the inoperative contractions of the organ; or until the membranes have been ruptured, so as to permit the child to glide over the membranes, seeing the membranes will not glide over the surface of the uterus, as they should do, to allow the child to be born.

To break up the adhesions is an easy matter in those cases where they are situated near the os. The finger gently introduced around the neck, between the membranes and the uterus, readily accomplishes the desired result. Where the adhesions are beyond the reach of the finger I do not think it advisable to attempt the separation by instrumental means, but rather to rupture the membranes at once, as by this means we effect the chief thing to be desired, viz., the supervention of normal labour. In some cases, after you have broken up the adhesions as far as the finger will reach, you will often find that the os will rapidly dilate, and in a few minutes the finger can be still further introduced and the detachment completed.

I give the following case—one out of many—by way of illustrating what has been said:

Mrs. L. aged 20, first pregnancy; has been in labour last four and a half hours; pains irregular and spasmodic, and accompanied with intense suffering. On examination found os dilated to the size of a twenty-cent piece; membranes adherent on the right side, and neck of uterus turned that way. A somewhat thick layer of muscular fibres, covered the membranes, spread over the dilated part of the os. As I could not reach all the adhesions the membranes were ruptured, after which the pains became regular and powerfully expulsive, the os dilated rapidly, and the child was born in less than two hours.

By way of illustrating another class of adhesions I may state that during the past week I attended a Mrs. R., aged 21, in her first confinement. On examination found womb almost upon the floor of the pelvis, and os dilated to the size of a twenty-cent piece; has had, grinding pains; little expulsive power for last eight hours. On introducing the finger could feel no adhesions between the mucous membrane and uterus. Being somewhat in

doubt as to the cause of the irregular contractions, I examined more carefully, and then found that there were tolerably strong adhesions between the posterior part of the neck of the uterus and vagina. The adhesions did not exist over the anterior third of the neck. The separation of the parts was easily accomplished, when the expulsive power of the pains was greatly increased, the os dilated more rapidly, but the membranes did not protrude. With the dilatation of the os the womb descended more upon the perineum, and I then found adhesions between the mucous membrane and the uterine surface, which, when broken up, the labour progressed more rapidly, but I finally was obliged to deliver by the forceps, as the head presented in the third position, and the woman was too weak to complete the labour alone.

This case is mentioned not only on account of its unusual character, but also because it shows that external adhesions may interfere with labour as well as adhesions between the mucous membrane and the inner surface of the womb.

Before leaving the subject it might not be amiss to say that the cause of gestation being of shorter duration in first pregnancies is probably due to a more rapid maturation of the decidua, combined with a very sensitive state of the muscular surface of the uterine cavity, which favours the induction of muscular contraction before the decidua is thoroughly detached.

It also explains why we have trouble in delivering the placenta in many instrumental cases. The adhesions render the contractions abnormal and inefficient, and this condition renders the forceps necessary to complete the delivery, while the adhesions remain, as before stated, to give us further trouble.

The effects of adhesions upon the delivery of the placenta deserve some consideration, but as I have not had any cases illustrating my views upon the subject, I shall not longer occupy your attention.

We would have no difficulty in attributing hour-glass and spasmodic contractions of parts of the uterus upon the placenta to the same cause that induced such contractions during the first and second stages of labour. In addition to the cause of such contractions, which have been spoken of already, there is the possible irritating effect of the placenta when adherent to the uterus. The mass of the placenta being somewhat firm, and the uterus contracting upon it, might easily cause laceration of some muscular fibres, and thus originate the hour-glass contractions. Also, the contractions might be due to the effect of lacerations of the tissue of the surface during labor, which had left the parts irritable and ready to contract as soon as opportunity offered.

As to treatment of retained placenta I have nothing special to say. We should follow the recognized mode of dealing with such cases, and, when possible, effect the detachment and removal of the entire mass, with its membranes.

VICTORIA SQUARE, Montreal, 19th April, 1872.

Medicine.

OBSERVATIONS ON SEA-SICKNESS, AND ON SOME OF THE MEANS OF PREVENTING IT.

By SIR JAMES ALDERSON, M.D., D.C.L., F.R.S., Consulting Physician to St. Mary's Hospital.

Some remarks which I published lately through the medium of the *Journal* were not intended to be an exhaustive statement of my views on the subject of sea-sickness. I propose, therefore, to consider a few points which I intentionally postponed for a future occasion; and I may at the same time briefly allude to certain objections which, though courteously offered, have, as I believe, been made without a sufficient apprehension of my view of the subject, and of the scientific basis on which it is founded.

The chief points which I omitted to consider are, the immunity of certain individuals from sea-sickness, and the relief which is usually experienced after a certain time spent at sea. But, before entering on these special topics, I wish to enlarge a little further on the connection of sickness and vomiting with brain-disturbance. It is well known to pathologists that, of all the causes which act sympathetically to induce vomiting, affections of the head are the most common; nothing can affect the sensorial functions without in some way disturbing the stomach. The experience of all practical men testifies constantly to this; but if reference to published authority be desired, I may quote undeniable testimony in a valuable paper in the *Transactions* of the Royal Medical and Chirurgical Society, by Sir Benjamin Brodie (vol. xiv., p. 339). In treating of concussion of the brain, he says, that "sickness and vomiting, for the most part, are early symptoms." Now there can be no doubt that the effect on the brain produced by the blood during the descent of the ship is of the character of a slight concussion. It is in the less severe forms of concussion that sickness and vomiting most certainly occur. In the graver forms of head affection, such as apoplexy, it is not so often found, because it requires a certain degree of excitability of the brain to

induce the act of vomiting, and that excitability has been destroyed by extreme pressure.

I pass now to the immunity of certain individuals from attacks of sea-sickness. This, at first sight, seems an anomaly, and presents a difficulty in accepting the theory which I propose, as well as every other theory which may be brought forward. I can only suggest, as a solution of the difficulty, that there are constitutions so formed as to be very slightly subject to sensorial impressions. The same inequality subsists between different individuals in their capacity of being emotionally affected; some are unmoved by the most distressing subjects; some have their feelings easily excited. It must be borne in mind that the argument as to exceptional immunity is equally applicable to all methods of explaining the existence and causes of sea-sickness.

In regard to the recovery from sea-sickness, there is much to be said without abandoning the theory of the original cause. A wonderful and instinctive power of accommodation to circumstances is possessed by the human frame. In the course of time, the sensorium is able to adapt itself to unusual circumstances; and on this point again we may refer to the same paper by Sir Benjamin Brodie, who, to his statement, "that sickness and vomiting are early symptoms," adds "that they seldom continue after the patient has recovered from the first shock of the accident." I may add to this, that, when organic change has taken place in the brain, as in the presence of a clot of blood, from the rupture of a vessel, there is, on reaction taking place, a cessation from sickness and vomiting.

That brain has an extraordinary power of adaptation to circumstances, is evidenced by recovery from hemiplegia, as well as by numerous recorded instances of foreign bodies, such as bullets, etc., being lodged in the brain with subsequent recovery. As an auxiliary to the power of the brain to accommodate itself to the motion of a ship at sea, I must refer to the instinctive act of inspiration, of which I have already spoken, as a great adjunct to relieve the brain from an undue supply of blood.

It must be remembered that recovery from sea-sickness during a voyage, in most cases, takes place after one or two days; by which time the sufferers, now convalescent, have exchanged the short choppy waves of the English channel for the totally different seas of the Atlantic Ocean or North Sea. Having myself several times crossed the Bay of Biscay, and having been once three months on board a sailing vessel, I am quite aware of the entirely different kind of sea to be met with outside the Channel; and I can conjecture that any relief which took place in the broad swelling

waves of the Atlantic would not have been experienced if I had been still pitching about between England and France.

As to my suggestion, I must remark that it was intended to prevent sea-sickness, and not as a remedy to relieve it after it has been once set up. It is offered as a means whereby the action on the sensorium shall never be induced. After that has once taken place, the effect cannot be expected to subside immediately from the mere avoidance of further exciting cause.

I am afraid that some misunderstanding may have arisen from the use of the word "towards" instead of "in the direction of" the bows of the vessel. I could not have meant to indicate the forward part of the vessel as desirable for the recumbent position; because, the centre of oscillation of a ship being the point about which all its parts may be supposed to oscillate, whether in pitching or rolling, it will be in the midships that the least motion will exist; and it is obvious that there, or as near as may be, the berths or sofas should be placed, especially those for the ladies, who, from delicacy of organisation, are the most easily affected.

I must just allude to a suggestion that "precaution as to diet" is of great importance in preventing sea-sickness. Of course, before going on board, any excess or change of usual habits would be obviously inexpedient; but no rules for a particular diet before going on board can possibly be suited to all habits and constitutions: that which would be suitable for strong men would be very ill-adapted for delicate constitutions. There is evidence that the contents of the stomach have very little to do with the sickness, which is secondary only to a disturbance of the sensorium. Vomiting and retching equally take place after the stomach has wholly emptied itself; and this is a distinctive difference between vomiting which arises as a consequence of cerebral disturbance and that from disordered stomach.—*British Medical Journal*.

Chemistry.

ON THE "CARBON CLOSET SYSTEM."*

BY E. C. C. STANFORD, F.C.S.

I am induced to bring this subject specially before this Section because I consider its merits have never been properly brought under your notice and fully discussed. It has been so fashionable

* Read before the Mechanical Section of the British Association at the Edinburgh Meeting.

to consider the water-closet system as the perfection of sanitary skill, particularly among engineers, who generally look upon it as the *only feasible* means of house excreta removal, that it requires some hardihood for a chemist to urge here a totally opposite opinion. The fact is, however, that by putting this noxious and yet valuable material in the sewers the engineers have removed it from the power of the chemist to bring his science to bear on it. All proposals to deal chemically with the enormous dilution of town sewage have hitherto failed; nor, as far as we know, is there the least probability that anything effectual or profitable can be done in this direction.

Now I have always held that if we are to do anything to assist sanitary science we must begin with the noxious material at an earlier stage of excreta removal than as town sewage. Moreover, I consider that the system by water carriage is founded on error. To accomplish the required result and enormous proportion of water is necessary; no doubt it was at first supposed that this large proportion of water would oxidise and render innocuous the poisonous matter, but the contrary is now admitted to be the case—decomposition is rapidly increased and promoted. Moreover the poison germs, so far from being destroyed, are diffused broadcast with appalling rapidity. In times of danger this becomes painfully evident; hence the *Times*, in a recent article on the expected cholera epidemic, raises an alarm in the following terms:

"In the first place, the destruction of the excreta from cholera patients must be insisted on under the heaviest penalties, and a system of inspection adequate to enforce this provision must be organised. Without these preliminary safeguards we cannot hope to resist the enemy with any success. So long as the germs of the disease are allowed to pass through the sewers into the rivers, to be washed up by the tide against our seaside villages, to be wafted about our streets in the form of an impalpable dust, we cannot hope for any good results from sanitary measures of the ordinary kind. Cleanliness, ventilation—above all a pure water supply, are advantages which cannot be over-valued. But until the germs of disease are systematically destroyed and excluded from any chance of mingling with the air we breathe and the water we drink, nothing will control the ravages of cholera. Every other precaution is subordinate to the main preventative measure, which it will need special powers to carry into effect—the destruction of the cholera germs before their diffusion."

The "sanitary deadlock" is sufficiently perplexing without this further complication; one authority obliging the distracted members of town councils to drain *somewhere*, another interdicting the

drains from flowing almost *anywhere*; but none telling them *where* or *how* to dispose of their refuse. Now, however, the sewage question is to undergo another complication. The citizens of London, after paying so very handsomely for their grand experiment on main drainage, are to be told that, just when they most require it to purge their houses of poison and pollution, the mighty engine has broken down, and they must fall back on their own resources.

There can be no doubt the *Times* is quite right; the prohibition is absolutely necessary if the plague is to be stayed; but admit this, and the water-carriage system goes by the board, it must be condemned as unable to cope with the removal *under all circumstances* of house excreta.

In Glasgow, the Sanitary Section of the Philosophical Society, after two years' discussion, on which most of the members entered with strongly preconceived prejudices in favour of water carriage, a unanimous resolution was passed strongly condemning it, and insisting that in the perfect system of the future all fœcal matters must be rigidly kept out of the public sewers.

It is a compliment to the intelligence of that resolution to find that public opinion is gradually working round in the same direction. The city of Glasgow may not have been so far wrong after all in watching and waiting the experience of the great city before committing herself to a proportionately costly scheme. At the time the resolution I refer to was passed, the water-closet at one end and irrigation at the other were generally considered the two *necessaries* to all civilization. We have lived to see that neither of these are necessities, and that neither are generally applicable or advantageous. We are told now that successful irrigation must be accompanied by processes of deposition or filtration. The British Association Committee even recommend two separate systems of drainage, and this partly concedes what the resolution referred to demands. I would, however, go further, and treat the house excreta as a material the removal of which should have no connection whatever with the sewers and should never be mixed with water; in fact, that the sewage system should not be complicated by this, the main source of the worst pollution.

Now I affirm that in the most populous cities the general use of the carbon closet system is perfectly practicable, and that it must be by far the most healthful and by far the most profitable means of getting rid of the nuisance.

In this Section last year I heard a gentleman say that "no scavenger should ever visit his house." Now I should like to have asked how that gentleman disposed of his house ashes, because either he allowed the scavenger to call for them, which disproved

his assertion, or he put these into the sewers, in which case some other local authority ought to look after him. This, however, is not an uncommon feeling of repugnance on the part of the householder, and must be duly respected; yet the most prominent advocate of water carriage must draw the sewage line somewhere, and all would draw it outside of house ashes. These must not in any case find their way into the sewers. But in the more noxious and more valuable material we actually have much less to remove, and the removal can be made equally inoffensive. I admit that any system to be generally adopted must require no attention from within and must be quite as automatic as the water-closet. This, however, is easily arranged, and if one tithe of the talent and ingenuity had been spent on the dry system that has been lavished on the wet, it would, I believe, have long ago superseded it in this country. There is no more necessity for a scavenger to enter a house properly arranged on the dry system than on the other.

. Let us consider, in the first place, what is the actual total amount of excreta per head to remove; and I wish to premise that I would advocate no system that was not intended to cope with the whole of the house excreta, solid and liquid, leaving only the wash-waters to enter the ordinary drains.

I have published a table, taken from various authorities, showing the estimated amount of this material to be removed per head, with its value.* The last table are the figures employed by Her Majesty's Commissioners on the Pollution of Rivers in their reports, and as they make no allowance for loss, for absence from home, &c., I think the average of 8 cwts. (including only about $\frac{3}{4}$ cwt. solid excreta) per head may be fairly taken; so that in a large household of ten persons it would amount to 80 cwts. (about 8 cwts. solid), and its chemical value would be about 80s., or 8s. per head. The same household would use at least 20 tons of coals, and probably send away four tons of ashes. The total annual quantity of charcoal required therefore could not exceed 4 tons, would probably be much less, and the whole removal, allowing for the drying action of the charcoal in the vault, would be about 5 to 6 tons weight.

Eight cwts., then, is the total quantity to be annually removed per head, and it is now generally effected by mixing it with 1,200 tons of pure water, all of which it renders highly offensive, and its value, however it may be extracted, if that be indeed possible, is reduced to very much less than this, over and above the dilution, in inverse proportion.

* *Chemical News*, vol. xxii., p. 302.

It is scarcely necessary to reiterate the disadvantages of this method of removal. We know that the closets are costly in erection and in repairs, that they consume and foul a large portion of our water supply, and that they have hitherto wasted the whole of the material. We first tried to confine the polluted water in cess-pools, then we converted these into a network of deep laid sewers, thereby connecting all the houses and ensuring the spread of a cholera or typhoid fever epidemic. We do not know yet how to deal with the sewer gases, and have discovered no certainly perfect method of getting rid of the pollution. Now it does appear to me that we have mistaken the application of water; we do not require such a gigantic carrier and diffuser. Knowing how possibly dangerous the excreta may become, we ought to seek a disinfectant which will add as little as possible to its bulk and increase its manurial value. Therefore I would at once add that precisely the same objection may be urged against the use of earth, which would require three and a half to four times the quantity of the material removed, and reduce the value of the manure to even less than this in inverse proportion. The analyses of earth-closet soil by Dr. Gilbert confirm my views as to the poverty of the manure. The same applies more forcibly to the use of ashes, of which even more are required. These two materials act only as deodorisers so long as they are dryers; let the mixture become damp, and it at once becomes offensive. The use of earth in large cities must be impracticable and will always be expensive. Ashes can generally be provided in the houses, but these are not so good as earth, and the manure is scarcely worth removing. In all the tons referred to in the British Association Committee's reports where this system is adopted the price obtained is merely nominal.

In discussing the merits of a dry system, we have always this advantage over the advocates of the wet system, that, while they are limited to the use of water, we have a large choice of dry deodorisers. That which promises the greatest success is charcoal, and this is now being made the subject of experiment on a pretty large scale. There is no greater difficulty than to provide closets for workmen which shall always be perfectly inoffensive and shall not get out of order. I can point out one work where the system I advocate has been in use for three years by 150 men, and the closets have never got out of order. We have never worked with more than a fourth the quantity as compared to earth, and I am convinced that we may reduce the amount required even to one-eighth. I have assumed, however, that we use a weight equal to

the material to be removed.* The house may have a closet on each floor—say three, or even four; these are arranged one over the other. Each draws on the same supply of charcoal at the top of the house; the contents of the closet are allowed to fall through a 12-inch thin galvanised iron pipe into a water-tight cemented cesspit in the basement of the house. The charcoal reservoir is filled and the cesspit emptied by the scavenger once a year, the whole process being quite external to the house. The urine is emptied into a simple earthenware urinal in the closet on each floor, and it falls through a lead pipe direct into the pit, where there is always sufficient excess of charcoal to perfectly absorb it. The total absence of all odour is most remarkable. No water-closet can be compared to it. The quantity to be removed is reduced to less than twice the weight of the total excreta, and when removed an ordinary observer would scarcely know it from the original charcoal employed. The next step in the process is to remove it to the chemical works, where it is re-burned in iron retorts, the ammonia distilled off, and the charcoal returned to the householder. In small villages one of the retorts at the gas works will get through a large quantity, and the ammonia will add to the value of the gas liquor. There is a constant increase of charcoal obtained from the excreta itself; this is an animal charcoal similar to that from bones; it contains the whole of the phosphates and the potash, and with the ammonia is available for manure.

The chemistry of the process has been so fully gone into before, on a former occasion, in another section, that I deem it unnecessary to refer further to it here; it will be found very fully described in several papers already published in the *Chemical News*.* I wish here to show how capable the process is of general extension. It is scarcely necessary to assure you that the cholera germs cannot survive the ordeal by fire which they suffer in this treatment. If, however, in case of cholera, further disinfection be desired, it can be easily effected when the whole excreta of the house is in a small pit, and in any case it is removed from our neighbour's contamination. A remarkable proof of the wonderful freedom from odour is described in a former paper.†

The process is now being worked by a small company, called the

* The remarkable drying action of the charcoal before alluded to was singularly shown in one house, where the contents of a wash-basin had been daily emptied into the urinal and found its way into the vault for twelve months before it was accidentally discovered. The manure, when removed from the vault, was apparently quite dry.

* *Chemical News*, vol. xix., pp. 253, 269, 291; vol. xx., p. 196, and vol. xxii., pp. 289 and 301.

† *Chemical News*, vol. xxii., p. 303.

Nitro-Carbon Manure Company, Limited, established by a few gentlemen to show that the process, even on a comparatively small scale, can be made a commercial success: all are satisfied as to its perfectly fulfilling all sanitary requirements. Several of the principal shipbuilders on the Clyde are erecting the necessary closets and urinals in their yards, and in a few weeks these will be used by about 10,000 men. In re-burning the material the retorts to be employed will be Norman's patent twin rotary retorts, now much used in the principal sugar houses in Glasgow. An arrangement has been made with the shipbuilders to allot them shares in the Company to the value of the closets erected, and thus these employers of labour will share in any profit which may be made. If the process pays as well as we expect, it must rapidly extend: but as I know you will deem it your duty to examine every possible solution of the sewage difficulty, I make no apology for bringing it under your notice at this stage. Now, in estimating the profits of any chemical process as compared with irrigation, it is quite proper to value the manure produced only by chemical analysis. Her Majesty's Commissioners adopt this course; they attach little importance to farmer's certificates, but value entirely by chemical analysis. This is the only fair way, because it shows exactly what it is worth in open market; and, valued in this way, all the manures produced by the several sewage companies are comparatively worthless. Yet, although this has been abundantly proved, why are the shares at such a premium? But in comparing the value of irrigation with that of any chemical process dealing with sewage, they bring in another and, I submit, an improper element, *i.e.*, the total profit of the farmer. This is unfair: the farmer buys his manure—say, made from bones; or, say, from excreta—by analysis at its market value, and his living is made out of what that investment produces from the land. The irrigationists have no right to put themselves in his place, reap his profits, charge themselves nothing for the sewage, and call that "making it pay." In one of the accounts quoted in Her Majesty's Commissioners' Report, the "right of shooting over the farm" is actually entered as an irrigation profit!

We have hitherto used the ordinary earth-closets of Moule's patent, simply throwing smaller charges of charcoal in coarse lumps; these have been wonderfully successful, but in order to use fine granulated charcoal, and to considerably lessen the quantity required, it was necessary to invent a closet for this special application. I applied to my friends, Messrs. Pollock and Pollock, engineers, of Leeds, and the closet exhibited is the result of their

ingenuity.* It delivers a minimum, but accurately measured quantity, and places it exactly where it is required; and it is remarkable what a small quantity of the deodoriser is sufficient to keep the deposit perfectly free from odour.

I exhibit also the plans for workmen's closets; and when I add that in all the yards where these are being erected they are to supersede large and expensive ranges of iron buildings and water-closets, you will understand that their great disadvantages have been already proved to the satisfaction of those pioneers of successful engineering, the shipbuilders on the Clyde. The impossibility of stopping their action and rendering them offensive is highly important. An instance of the extreme difficulty of dealing with factories is mentioned in a former paper.† The almost universal experience is that the water-closet is unsuitable for factories. The owners of private houses are beginning to think in the same direction, or why do we so constantly find disinfectants still employed? If the water system is or can be made perfect, why should such agents ever be required? These disinfectants have all, more or less, a disagreeable odour, are all expensive, add nothing to the value of the product, and confess the weakness of the water-closet system.

I think, therefore, the method of the future must be some such modification of the dry process as that now referred to as the Carbon Closet System.—*Chemical News*.

ON A METHOD OF DETECTING SMALL QUANTITIES OF SUGAR IN URINE.

By J. SEEGEN, M.D., Professor in the University of Vienna.

Trommer's is the most reliable and delicate test for sugar. With its aid, I am able with certainty to make out 0.3 *milligramme* (0.0046 grain) of sugar dissolved in 10,000 times the amount of fluid. This great delicacy of the test, however, only holds good as long as we have to do with a watery solution of sugar. If, on the contrary, small quantities of sugar are to be detected in urine, Trommer's test is neither delicate enough nor reliable, for two reasons. 1. Urine contains certain substances (colouring matters, creatine) which prevent the suboxide of copper when formed from being precipitated; no separation of the reduced suboxide of copper, therefore, takes place, the blue fluid only becoming yellow or yellowish-brown, or presenting a turbid discoloration.

* This closet can be obtained at the Carbon-Closet Company, 46 Naymount street, Leeds. It was figured in the *Engineer* for August 5, 1871.

† *Chemical News*, vol. xxii., p. 302.

2. The same processes of reduction are also brought about by uric acid; and urine, containing a considerable amount of uric acid, acts on Fehling's test-fluid exactly in the same manner as urine containing 0.1 to 0.2 per cent. of sugar.

The method devised by me has for its object the exclusion of those other constituents of urine which would disturb the proper action of the test, and the transformation, as it were, of the saccharine urine into a watery solution of sugar. Animal charcoal has the property of retaining most of the constituents of urine, more especially the colouring matters and uric acid. After filtering a watery solution of uric acid through animal charcoal I could (provided the charcoal had been good), after repeated filtrations, not find a trace of uric acid in the filtered fluid. Now, in order to detect small quantities of sugar in urine, I proceed in the following manner :

I filter one or two ounces of the urine several times through good animal charcoal until the urine is completely colourless. This operation only takes a few minutes. Then I wash the charcoal on the filter with a little distilled water, and to this water, when filtered off, I apply Trommer's test. The water with which the charcoal has been washed is almost as sensitive to Trommer's test as a watery solution of sugar, and in it I could detect even 0.01 per cent. of sugar by a beautiful red precipitate of suboxide of copper, whilst the original saccharine urine, when not filtered, only produces a yellow discoloration of Fehling's test-fluid. With urine containing a little more sugar—say, 0.1 to 0.2 per cent.—the water flowing off from the second and third washing acts even more energetically upon the test-fluid than that of the first washing, producing and even purer deposit of suboxide of copper. The water obtained by the subsequent washings thus evidently contains the sugar in a purer form. With normal urine, the water obtained by the above process is either entirely inactive towards Fehling's test-fluid, which remains blue, or it assumes only after a while a slight dichroid (varying colour according as the light falls on or passes through) turbidity. The water obtained by a second and third washing always remains without any effect. When the quantity of sugar has to be determined, the urine must not be filtered through charcoal, as the latter always retains a certain quantity of the sugar which cannot be removed again by washing.—*British Medical Journal*.

Canada Medical Journal.

MONTREAL, MAY, 1872.

THE CORONER'S COURT.

One of the relics of barbarity is the Coroner's Court. "Crown's quests" have from time immemorial been the subject of ribald jests and sarcastic merriment. We should imagine that the lack of dignity, or the absence of all the paraphernalia which constitute a well-ordered court of law has led to this generally entertained opinion; but, more than this, the absurd and irrelevant verdicts rendered have been seized upon by minds like those of Goldsmith and Dickens, and have served to bring into discredit and ridicule a process in our criminal jurisdiction unfitting the solemnity of the occasion. Investigations touching the death of a human being should, from the very nature of the inquiry, lead to serious thought, patient search for the actual cause of death, and a truthful and straightforward verdict. No personal considerations should be allowed to weigh a hair's breadth. Justice should be administered even-handed, and if a gross wrong has been done it should not be smothered by a verdict of death by the visitation of God.

These reflections have been forced upon us by the hurried and unseemly manner in which, on several occasions within the past few months, cases have been disposed of in this city, so that the office of Coroner appears to have become a useless appendage to our criminal administration; nay, worse, in some cases to which we will allude the whole proceedings were a cruel mockery. If we must have a Coroner—we do not seek to abolish that office—let us have a learned and independent member of the legal profession. It was at one time held in England that the office of Coroner should be filled by a medical man; these views have lately been modified, and it is now believed that physicians do not make the most efficient coroners.

Some years ago, when Montreal was half the size it is at present, there were two coroners. The process of investigation in that day was performed with greater satisfaction to the public than at present. We do not think it necessary to multiply the office of Coroner, but we do think it a reflection on our judicial system to have an office of such gravity and *quasi* importance filled inefficiently.

But, to return to the subject under discussion, we have stated that several cases have been summarily disposed of, and that the verdicts did not give satisfaction to those who thought on the subject. One, the case of a man called Harry Lewis, who died with all the symptoms of poisoning by opium, or of some of its preparations, or salts. It was testified to, under oath, that the man, the evening before his death, had procured morphia in quantity from a drug store in this city. Furthermore, he had been seen to swallow a white powder. A lengthened investigation took place; the viscera of the chest and abdomen were examined, and their condition tallied with what is generally observed in cases of poisoning by opium. No chemical examination was ordered: no attempt to decide the question of opium poisoning was made; the jury were instructed to bring in a verdict of death from congestion of the lungs from natural causes, and here the case ended. Now it happens that the public are deeply concerned in this very case, because it is contrary to law for any druggist or apothecary to sell any noxious thing or poison without the order of a physician, and it did not appear in evidence that the druggist who sold Harry Lewis the morphia was justified in so doing, at least he was not protected from censure or criminal prosecution by holding an order from a recognised practitioner for the dispensing of morphia. It is quite possible that the man did die from natural causes; nevertheless it remains unproven, and if the crown were to institute criminal proceedings against the druggist, one essential element of his defense is wanting.

Again, another case is brought before the Coroner, somewhat of a different character, but which is disposed of with equal dissatisfaction. A man complains of a stomach-ache and resorts to a druggist, who not only prescribes but actually dispenses his own remedy. The next we hear of the man is that he is found dead in a hayloft. A jury is summoned, evidence is taken, and death by the visitation of God the verdict rendered. Here, again, society is deeply interested in this case and its results. The law of the land permits alone persons holding the license of the College of Physicians and Surgeons to prescribe medicines or to exercise the functions and privileges of a physician in the Province of Quebec. The case remains in doubt, and some charitably-disposed persons would naturally and very reasonably believe that the druggist had given the man an over-dose of some drug, which had caused his death. Inquiry is thus burked, and injury is sustained by the druggist who, in all likelihood, gave the man a harmless dose of medicine; but a doubt remains as it is unproven.

Again, we read of a woman who dies and an inquest is held on her body. The medical men who are in attendance at the Coroner's Court find a whitish powder about the premises which they allege to be strychnine, and hence, without further inquiry, a verdict of death from taking an over-dose of strychnine is rendered. Since then we believe the Attorney-General has ordered the body to be exhumed, and a chemical analysis to be made to prove the presence or absence of the poison. A question naturally arises, with what ulterior object is this chemical analysis ordered to be made? Is it to decide the question of the actual cause of death? The Coroner and jury have decided, on what we deem to be insufficient data, that the death was caused by strychnine; thus bringing into ridicule the whole proceedings.

Another case is on record. A man named Bryson was, in May, 1870, found dead with his throat cut. The deceased lived in a house in St. Dominique street, and it was alleged that early in the morning, between four and five o'clock, he rose from his bed and committed the act of self-destruction. A man, whose name is not given, was present in the house, if not in the room, at the time of the occurrence, but his evidence was not produced before the jury. The medical gentleman who examined the case noticed that blood, in considerable quantity, was on the side of the bed and on the floor by the bedside. This did not quite agree with the account of the occurrence given by the inmates, as it was stated that he had risen from his bed and had committed the act while groping about the room. The neighbours had heard a noise as though a scuffle was going on, followed by groans. This case, at the time, called forth some very sensible and pertinent comments by the daily press. No searching or critical investigation appears to have been made; the inquest was hurried through; the man who had slept in the house, but who was not an inmate of the premises, was not examined, and the verdict rendered was one of *felo de se*; the body was buried and the whole circumstances consigned to oblivion.

But another case comes before us, and one in which, through the stupidity of the police, a body is found drowned and is disposed of in the course of a few hours, we believe somewhat under four. The inquest is held, and the man, who was a Protestant, and who had been missing since last December, was buried in the Roman Catholic Cemetery; whether in the consecrated ground or not we cannot say; in this case the friends of the deceased, had not only notified the police but had publicly advertised the circumstances of his disappearance and after considerable running

about and some expense, they had the body exhumed, recognised it, and had it removed to the Protestant Cemetery.

Again, we have the case of the man Jones who shot himself. In this case, aspersion of a serious and damaging character was published by a city paper, reflecting on the conduct of the professional gentleman who attended the case. This attack was so gross as to lose in the telling of the story. But who is to blame that the public are as much in the dark, after the inquest, as to the cause of Jones' death, as they were before the investigation? All we know is that the country is saddled with the expense of a useless trial and inquiry which is allowed to drop for lack of a post-mortem examination of the head of deceased.

These cases point either to the lack of judgment or the want of knowledge of the presiding officer. We will not impugn his honesty in the matter.

We have heard of instances in which the Coroner has taken upon himself to carry on an inquest without any medical evidence whatever. Now, this is decidedly wrong, because medical testimony is the only evidence upon which a jury can arrive at an accurate knowledge of the cause of death. It were better to have no inquests at all, than that they should be conducted in a manner to bring discredit on all connected with the Coroner's Court. Medical evidence should not be suppressed, nor should it be lightly passed over. Nor, again, should the Coroner or jury have the power of deciding the question as to the expediency of post-mortem examination. This is peculiarly the province of the physician, and where he is unable to assert positively the actual cause of death, then should he be required to examine the body *post mortem*, inspecting the condition of the various viscera to decide this point. We must state that the present system of conducting Coroner's inquests, not only in this city but generally throughout the country, is, as a rule, unsatisfactory, and it is high time to make some change, or abolish altogether the office of Coroner, substituting a more searching, impartial and, in consequence, more reliable tribunal.

UNIVERSITY OF BISHOP'S COLLEGE—MEDICAL FACULTY.

The first convocation for the conferring of degrees in Medicine, in the new Medical Faculty of the University, took place in the the College, Lennoxville, on Thursday, the 4th April.

The chair was occupied by the Hon. Edward Hale, Chancellor, having on his right His Lordship, the Bishop of Quebec, President of the University.

Dr. David, Dean of the Faculty, presented the following candi-

dates for graduation. Having taken the usual oath they severally received, at the hands of the Chancellor, the degree of C.M., M.D..

André Latour, Lachine; Wolfred D. E. Nelson, Montreal; Henry S. Cunningham, St. Catherines, Ont.; Philippe Deselets, Three Rivers; Joseph E. A. Lanouette, Champlain; Richard N. Webber, Richmond.

The Dean also made the following announcements:

The number of students in attendance during the session was twenty-five.

The following gentlemen passed their Primary Examination: Mr. Godfroi Dubuc, Chambly; Rodolphe Sicotte, St. Hyacinthe; Valmore St. Germain, St. Hyacinthe; E. A. Duclos, Montreal; Jeremiah Eneas, Montreal; Isaac Fontaine, St. Barnabé; Wm. MacDonald, Montreal.

The prize for the best Final Examination was awarded to Mr. André Latour, of Lachine; that for the best Primary Examination to Mr. Godfroi Dubuc, of Chambly, who also took the prize in the Senior Class of Practical Anatomy. The prize in the Junior Class of Practical Anatomy was awarded to Mr. Robert Costigan, of Montreal, Mr. John Ahern, of Quebec, receiving honourable mention. The two prizes offered to the students of the Senior and Junior Class of Physiology, who obtained the highest number of marks at the written examinations during the session, were awarded to Mr. Godfroi Dubuc (Senior Class) and Mr. Robert Costigan (Junior Class), Mr. Richmond Spencer and Mr. John Ahern (Junior Class) receiving honourable mention for the excellency of their papers.

The graduates were subsequently addressed by Dr. David. His Lordship, the Bishop of Quebec, and the Rev. Dr. Nicolls also addressed the Convocation. In the evening a conversazione was held, which was very largely attended.

We give below the examination papers of the College of Physicians and Surgeons of Ontario for which we are indebted to our cotemporary the *Canada Lancet*.

COLLEGE OF PHYSICIANS AND SURGEONS, ONTARIO.

PROFESSIONAL EXAMINATION, 1872.

DESCRIPTIVE ANATOMY—DR. SULLIVAN.

The brain being sliced to a level with the corpus callosum, how would you expose the third ventricle? Name the structures divided, and the boundaries of the ventricle.

Describe the arch of the aorta, its course, divisions, limits and relations.

Give the exact position of the pancreas, its structure, and the vessels and nerves that supply it.

What ducts convey secretions into the mouth, and at what points o they terminate?

Define the term fascia. Name the varieties, and describe the fascia lata.

The integument being removed, how would you expose the parts passing through the great sacro sciatic notch? Name them in order, and mention generally their destination.

What structures would it be necessary to divide to expose the median nerve from the axilla to its termination in the digital branches?

What class of articulations does the ankle belong to? Describe its ligaments, and name the tendons contiguous to it.

SURGICAL ANATOMY—DR. SULLIVAN.

Describe the mode in which you would expose the several cavities in making a *post mortem*, and state how you would remove the brain entire?

Name the muscles contracted in talipes varus and valgus, and any danger likely to occur in their division.

Give the exact course and relations of the external iliac, and mode of ligating it.

Give the boundaries and contents of the space in front of the elbow.

Describe the Lachrymal duct and Eustachian tube, and mode of catheterizing them.

MEDICINE—DR. WRIGHT.

Give the symptoms of Epilepsy in its two principal forms—Mittior and Gravior. Prognosis in each form, course, termination, and treatment.

Give the symptoms and signs of acute Pleurisy, distinguishing between symptoms and signs, the several stages, prognosis, course and treatment.

Give the symptoms of Dysentery in its Sporadic and Epidemic forms, and definition of the terms. What forms of febrile disturbance are liable to occur in each? What are the assigned causes of the disease? What the complications, prognosis, and full and explicit directions for treatment?

Give the definition of the term Exanthem. Give symptoms of

the premonitory stage in each, the phenomena of the second stage, and the average duration of each. Enumerate the most frequent complications.

Give the appearance of Vaccine disease.

Enumerate the causes which may change the shape of the chest, either increasing or decreasing its size, and means by which you may distinguish them.

MEDICAL PATHOLOGY—DR. WRIGHT.

Give the definition, causes and results of Passive Congestion.

Give the definition, causes and results of Active Congestion or determination of blood.

What is the condition of the blood in Rheumatism, Anæmia and Plethora?

Give the Pathological Anatomy of Enteric or Typhoid Fever.

MEDICAL DIAGNOSIS—DR. DEWAR.

Enumerate the Diagnostic points between Pulmonary abscess and the cavity of Tuberculosis.

Describe the symptoms of acute Bright's disease. Name and differentially diagnose the diseases likely to be confounded with it.

What is Enteritis? Describe its symptoms.

Diagnose Gout.

How would you distinguish between Spinal Meningitis and Myelitis? For what other diseases might the former be mistaken, and how would you recognise it from them?

SURGERY—DR. LIZARS.

Describe the difference between Osteo-Sarcoma and Osteo-Cephaloma.

Describe the varieties of Hemorrhoids.

What is commonly known as White Swelling of the Knee? Describe the Pathological changes that take place in its production.

Describe the difference between Concussion and Compression of the Brain.

Give the different varieties of Erysipelas, the distinguishing characteristics of each form, and their appropriate treatment.

OPERATIVE SURGERY—DR. LIZARS.

Describe the operations for Resection of the Shoulder Joint. State which you prefer, and your reasons for that preference.

Describe the operation of Paracentesis Thoracis, its site and dangers.

Describe the operation for removal of Superior Maxilla.

Describe the various Dislocations of the Hip Joint.

Describe the various methods of treating Fracture of the Patella.

SURGICAL PATHOLOGY—DR. FIELD.

Describe the Phenomena of Inflammation and the transitions to it from Normal Nutrition.

Give the Degeneration of the Fibrinous, and also of the Corpuscular portion of Inflammatory Lymph.

Name the five modes by which the healing of open wounds are accomplished; and describe the process of repair of open wounds.

Show the points of resemblance between a Mammary Glandular Tumor and Scirrhous of the Breast; also their distinguishing characteristics.

Give the distinctions between Innocent and Malignant Tumors as regards Structure, Growth, Ulceration and Propagation.

MATERIA MEDICA—DR. TUCK.

Explain and illustrate by example the Specific Operations and the Elective Action of Medicine.

Give the Description, Action, Use and Dose of the following: Creosote, Santonine, Chloral Hydrate and Tartar Emetic.

Give the British Pharmacopœal names and differential characters of Calomel, Corrosive Sublimate and White Precipitate, with their respective Uses, Doses, and Modes of Administration.

For a case of general Dropsy, write a prescription in full, and state the reasons for the introduction of each ingredient used.

WIDWIFERY—DR. BERGIN.

What are the signs of Pregnancy at the second, fourth and eighth month of Uterine Gestation? Is it always possible to pronounce positively at these periods as to the existence of Pregnancy?

Why does the occurrence of rigor in the child-bed excite the fears of the medical attendant?

How are Puerperal Convulsions to be distinguished from Convulsions that are Hysterical, Epileptic or Apoplectic?

Name the different varieties of Uterine Hemorrhage.

OPERATIVE MIDWIFERY—DR. BERGIN.

What circumstances and conditions justify and necessitate the use of the forceps, and distinguish the cases calling for the employment of the long forceps from those that require the short?

What precautions should be taken before, during, and after the application of the forceps?

Is there more than one mode of Version? If so, describe such modes, and the reasons that compel the operation.

Why should labor be induced prematurely? And if resolved upon, at what period of Gestation, and how should it be accomplished?

When should the Cæsarian section be preferred to Craniotomy?

When is Craniotomy performed, and name the necessary instruments to perform the operation?

PHYSIOLOGY—DR. _____.

Describe the Nerve-Tissue, its varieties, and its several Functions.

Describe the Functions of the Pneumogastric and Sympathetic Nerves.

What are the forces which carry on the Circulation of the Blood?

What theories have been proposed to explain the generation of Animal Heat, and what are the objections to them?

What are the Changes in the Blood in the Placenta, and how are they effected?

Describe the Nervous and Muscular forces by which Respiration is effected.

What are the Constituents of the Blood, and how is it formed, tracing it from the Chyme inwards?

Describe the Functions of the Skin.

Describe the Functions of the several portions of the Alimentary Canal.

CHEMISTRY—DR. SANGSTER.

Give briefly the two theories as to the nature of Electricity.

Describe the Composition, Preparation, and Properties of the compounds of Nitrogen with Oxygen, specially pointing out the relation between $N^2 O^3$ and the Nitrates, and $N^2 O^3$ and Nitrites.

Give Composition and Properties of Cyanogen and its Compounds.

Express by symbols the composition of the following Compounds: Tartaric, Acetic, Nitric and Benzoic Acid, Grape Sugar, and Chloroform.

Describe the Chemical character and composition of the Fats, explaining briefly how they may be decomposed into their proximate constituents. Give general Formula for the so-called Fatty Acids.

Describe the Chemical relations and characteristics of Urea and Uric Acid, and explain how they may be separated from Urine.

Give a brief synopsis of the Chemistry of the Vegetable Alkaloids.

PRACTICAL CHEMISTRY—DR. SANGSTER.

Describe the mode of preparing Pot Iodate, Absolute Alcohol, and Pure HCL. —

Give the group tests for bases, mentioning the principal Metals in each Group.

Give the distinguishing reactions by which you would recognise Salts of Copper, Lead and Mercury.

What special reactions characterize Opium and Morphine, respectively?

What impurities are more or less frequently met with in Commercial Potassium Iodide, Sulphate of Quinine, and Chloroform, and how would you detect their presence?

MEDICAL JURISPRUDENCE—DR. CAMPBELL.

Describe the appearances in Death by Drowning, and note the difference presented by the body entering the water before and after death.

Name several conditions attended with Insensibility, with brief characteristics of each.

State in days the average length of Pregnancy, the shortest period of Gestation compatible with Viability of Infant, and the most protracted with Legitimacy.

Distinguish between Live Birth as understood in Civil and in Criminal Law.

Give the Signs in the Living and in the Dead of recent Abortion, at the Fourth Month.

Enumerate in their order the Personal Peculiarities most to be depended upon in cases of Disputed Identity.

Define Hallucination, Illusion and Delusion, and under what circumstances they would warrant a Physician in signing a certificate for committal.

TOXICOLOGY—DR. TEMPLE.

How are Poisons Classified? Give a few examples belonging to each class.

What are the Symptoms of Poisoning by Oxalic Acid? Give Treatment and Tests.

What are the Symptoms of Poisoning by Strychnine, and give Treatment?

What are the Symptoms of Poisoning by Opium, and give Treatment?

Describe the Symptoms and Treatment of Chronic Lead Poisoning?

SANITARY SCIENCE—DR. CARSON.

What is the Annual Average of Death per Thousand in a Healthy Community?

What Diseases are likely to arise from Imperfect Drainage, from Deficient Nourishment, or Over-crowding?

What Cubic Space of Air should be allowed to each bed in a Hospital, and state the Diseases likely to be caused or greatly aggravated by Deficient Space?

Distinguish between Infectious and Contagious Diseases, with examples.

Describe Ozone, its nature, the modes of ascertaining the proportion in the Atmosphere, with the supposed effects of an excess or deficiency of it.

Define the term Endemic, Epidemic, and Enthetic, as applied to Diseases, with examples.

What kind of Impurities will Filtering remove from Water, and what remain unaffected by that process?

BOTANY—DR. CORNELL.

Why is Physiological Botany the most essential department of the Science of Botany, for the Medical Student to understand?

What is the Organized Fabric or Tissue of Plants? And how is Vegetable Growth effected?

Describe the Minute Anatomy of the Leaf, the cause of Death, and Fall.

To what extent is the Plant covered by Epidermis?

What is Phyllotaxis; and how do you use the term?

Describe Inflorescence, both Definite and Indefinite.

Describe minutely, the Food, Nutrition, and Elementary Composition of Plants.

Medical News.

EXTRACTION OF ARTIFICIAL TEETH FROM THE OESOPHAGUS.

Early on the morning of April 25th, I was aroused by the housemaid, who said she had something in her throat, and that she

feared she had swallowed her artificial teeth during her sleep. She was much distressed, and made constant efforts at deglutition. I passed my finger down the throat; but, although I could reach below the cricoid cartilage, there was nothing abnormal to be felt. I then passed a long œsophagus-forceps, guided by my finger, down the throat, and about four inches beyond the point where my finger reached, the forceps struck against a foreign substance, which I seized and gently withdrew. This proved to be a metal plate holding two teeth, and from which projected two ugly-looking hooks for its attachment to the adjoining teeth. The young woman complained of soreness while swallowing for a day or two afterwards, but is now quite well.

ARTHUR BRACEY,
Surgeon to the Birmingham Eye Hospital.

INJECTION OF TINCTURE OF IODINE AND OF ALCOHOL IN BRONCHOCELE.

Dr. Carl Schwalbe (*Virchow's Archiv*, Band 54,) speaks of injection of tincture of iodine and of alcohol in the treatment of thyroid tumours. Those in which it succeeds best are the soft and cystic enlargements; in hard fibrous tumours no result is obtained; and in vascular swellings there is danger of the production of embolism, unless the vessels have been partially contracted and the tumour diminished by the internal use of iodine and by electrolysis. If blood escape in a stream on the introduction of a cannula, the injection must not be made; in any other case it may be done with safety. About ten or twenty drops are injected as nearly as possible in the middle line of the neck, over the tumour, by means of a syringe fitted with a cannula having a short point. If no blood flow on the introduction of the cannula, the fluid is forced in; and before removing the instrument, the operator waits for a short time in order that the injection may not again flow out. The operation is sometimes followed by transient pain in the course of the nervus auricularis magnus, cough, gastric oppression, vomiting, and in weak subjects by fainting. One woman, who was subject to epilepsy, was seized with symptoms of hemiplegia soon after the injection, and died in convulsions. Schwalbe prefers alcohol for the injection, a drachm of iodide of potassium being at the same time taken daily. The injection may be repeated at weekly intervals. No confinement is required during the treatment; the average duration of which is two or three months.—*Wiener Medizin, Wochenschr.*, March 16th 1872.—*British Medical Journal*.