

*John Lowe*

**FIFTH ANNUAL REPORT**

OF THE

**MONTREAL SANITARY ASSOCIATION**

WITH THE

**PROCEEDINGS AT THE ANNUAL MEETING,**

HELD, AT THE NATURAL HISTORY HALL, APRIL 13TH, 1871;

AND

AN ACCOUNT OF THE PROCEEDINGS WHICH LED TO THE DISSOLUTION OF  
THE SOCIETY.

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MONTREAL:

THE GAZETTE PRINTING HOUSE, OPPOSITE THE POST OFFICE.

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1871

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## PREFACE.

As will be seen from the accompanying Report, a series of meetings of gentlemen interested in Building were held in the Natural History Hall, of which the first was convened by the Sanitary Association, and the others met by adjournment, under the presidency of T. S. Browne, Esq. At the last of these meetings, held March 29th, after considerable discussion, it was moved by Dr. J. Baker Edwards, seconded by Mr. S. J. Lyman, and carried,—“That this meeting do adjourn to the annual meeting of the Sanitary Association, with a view of re-organizing that Association on the basis of a subscription membership, and to carry out the proposed objects of that Association.”

“It was understood that the Annual Meeting would be held in about a fortnight.” (*Witness*, March 30th.) The following letter was addressed to the Editor, as soon as the President had fixed the date of meeting for April 13th :—

SIR,—When called upon at the last Builders' meeting to state the rules of the Sanitary Association, I had not the original documents at hand; and I find that they have not been printed in our annual reports. As a feeling was expressed that changes might be proposed at the ensuing annual meeting, to be held on Thursday evening next, I have to request that you will print the constitution, as agreed upon at the Mechanics' Institution, April 17th, 1866.

1. That the objects of the Society shall be, generally, to collect and diffuse information, and take action, on all matters relating to the public health; and specially, to assist in improving the abodes of the poorer classes.

2. That all persons contributing not less than 25c be members of the Association.

3. That the Catholic and Protestant Bishops of the Diocese be requested to become Patrons. (An amendment to this motion was lost.)

4. That the Clergy and Home Missionaries of all denominations, medical men, and the editors of newspapers, be *ex-officio* members of the Council.

5 and 6. Appointed officers for the current year.

7. That the Association shall render all the assistance possible to the Health Officers and the city authorities, with a view to the speedy abatement of nuisances.

8. Provided for the organization of District Committees to attend to the wants of different localities and different classes of the inhabitants.

9. Authorized the Council of the Association to make regulations for carrying out its objects.

It appears that while some of the officers have labored unremittingly, and while the annual reports have been much studied in various parts of the United States and Great Britain, very little interest has been taken in the action of the Association by the citizens till very recently. If the fault be either in the constitution or in the officers, the citizens will have full power to change them at the approaching annual meeting. I, for one, shall be rejoiced to resign my office into the hands of any one who will do better work than

Yours, faithfully,

PHILIP P. CARPENTER,

*Hon. Sec. Montreal Sanitary Association.*

A meeting was convened at the Natural History Rooms, by Mr. T. S. Brown, April 12th, “for the purpose of discussing the propriety of forming a Builders' Sanitary Association, on the principle of paid membership.” About a dozen members were present. Mr. Merry, who acted as Secretary, moved, and Dr. Wanless seconded,—“That an Association be formed having for its object the improvement of the sanitary condition of the city.” Dr. Carpenter did not consider this meeting in order, and moved in amendment that the concluding resolution of the Builders' meetings be re-affirmed, by adjourning to the annual meeting the next day. Three persons voted for the original motion, and two against it. Dr. Edwards then moved, and Dr. Fenwick seconded, the appointment of a committee to frame a new constitution, and to attend the annual meeting, to consist of Ald. Rodden, Messrs. T. S. Brown, G. Prowse, A. Perry, A. Wood, W. Merry, Drs. Hingston, Craik, Edwards, Wanless, and Fenwick.”—(Abridged from the *Witness*, April 13th.)

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## PROCEEDINGS AT THE ANNUAL MEETING.

(Abridged from the *Gazette*, April 14.)

The SECRETARY read the advertisement convening the meeting. It "earnestly invited all citizens interested in the public health, and the attendants at the Builders' meetings, to take part in the proceedings."

Wm. WORKMAN, Esq., ex-Mayor and President of the Association, then spoke as follows:—

GENTLEMEN,—Henpecked, sometimes abused and seldom cheered or encouraged, our society again and for the fifth time makes its annual appearance to-night in the interests of public health, a subject which, although so closely interwoven with our happiness and very existence, and so truly within the sphere of the Civil Government and Corporation, has always in modern times been greatly neglected. From the days of Moses, when, from the Records of the good old Book, we find much attention given to this subject, down to the latter end of the last century, little attention seems to have been directed towards it. At that period, France seems to have taken the lead in broadly enunciating the sentiment that the health of the people should become part of the care of the Civil Government. The Royal Society of Medicine of Paris was empowered to appoint a Commission of Health, to which was referred the care of manufactories, the condition of hospitals, and the cleanliness and classification of prisons. England, though of late years waked-up to the consideration of this subject, was long remarkably slow in recognizing its importance. The sentiment which ascribes disease and death directly to the hand of Providence, no matter what we may do to avert them, had no doubt a tendency to lead to the impression that human efforts are unavailing against such decrees. It was not until the cholera visited England, and the inhabitants of various towns and localities saw that the disease was either prevented altogether, or very much mitigated, by cleanliness and sanitary science, that the public mind and the Government became convinced of the fact that much of its destructive effect was the result of circumstances which lay within the control of human effort. Public attention was then given to the subject; the poorer localities, generally the quarters where disease and pestilence first find their foothold, were looked after, dwellings, yards and courts cleaned; and that indispensable necessity for thorough cleanliness and health, pure water, abundantly supplied. The results

which flowed from these efforts were of a most convincing character. It was clearly demonstrated that dirt, squalor, and moral degradation, as well as being dangerous to life and health, and disastrous in their effects upon society, are much more costly in their demands than cleanliness, health and morality. But, although in these experiments, as indeed in all others of a similar nature, comfort, cleanliness and economy were shewn to be clearly subservient to human happiness and safety, the subject of public health, though one lying at the very foundation of common society, has always been treated, as it were grudgingly and by piece meal, and has received public attention, or co-operation, or Legislation, only in proportion as self-defence or alarm for self-preservation, loudly demanded. It will not be denied, I presume, that even in this country our own humble efforts, although they have not actually encountered rebuff and opposition, have not been so cordially recognized or encouraged as might have been expected. Critics have sprung up, who have handled our statements and friendly warnings, with a spirit more of direct opposition, and too apparent ill feeling, than with a pure desire to elicit truth by useful comment and friendly discussion. To these men it seemed a crime that a few private citizens should associate themselves together, and should subscribe their own private means with a view of saving human life and promoting public health and happiness. I was forcibly struck with this feeling a few years ago in some of my attempts to collect for the Association, and that in quarters where one would least expect such a feeling. The cholera had shewn itself in scattered cases in the seaboard towns in the United States, and a few cases had occurred in Western Canada. The current of travel was very large and active from these sources, and a few cases of cholera, breaking out in some of the hotels or streets of our city, would have emptied the hotels, created general alarm, and spoiled what is termed by hotel-keepers their summer harvest. Under these circumstances, I thought it a most opportune period to solicit from these hotels aid for our Society; but notwithstanding that their entire summer business depended on our ability to keep the city healthy, I found that very few of them would recognize our efforts or aid us with one dollar. One hotel, the St. Lawrence Hall, formed an exception

to this unwise course, and subscribed willingly. We must not be discouraged, however, at such things, but persevere, believing that in the end public opinion will become educated up to the point of seeing the vital interests at stake in sanitary reform, which can alone be successfully carried out through such societies as ours.

The Secretary then read the

**FIFTH ANNUAL REPORT OF THE MONTREAL SANITARY ASSOCIATION.**

*Presented to the Annual Meeting at the Natural History Rooms, April 13th, 1871; Wm. Workman, Esq., ex-Mayor and President, in the Chair.*

The year 1870 was remarkable for an unusually hot spring and early summer, succeeding a very genial winter. As, in this city, the death-rate of children appears to follow the variations of the thermometer, for reasons previously explained, it was easy to predict an unusual number of deaths in June, as well as in the uniformly fatal months of July and August. Such predictions were, alas! too fully realized. The effect of heat in developing air-poisons from our polluted subsoil could scarcely be more vividly portrayed than by the contrast which the cool summer of 1869 presents to the heats of 1868 and 1870. The following are the average weekly number of deaths of children for the three years, omitting fractions:

	1868.	1869.	1870.
	Sunstroke year.	Cool summer.	Early heat.
May .....	71 .....	55 .....	65
June .....	77 .....	52 .....	129
July .....	127 .....	83 .....	138
August .....	114 .....	78 .....	103
September .	81 .....	62 .....	78

The children's deaths were the same in 1869 and 1870 during the months of March, October and November; they were fewer in 1870 than in 1869 during January and February; but higher in April, May, September and December; while the contrast is most fatally marked during June, July and August. There never were so many deaths in June and July, during the whole period over which the records extend; although there was no special epidemic in the city. For the first time also in our records, the week of highest deaths occurred at the end of June, instead of in July, as in all other years: that is to say, the sun's heat, beginning earlier in the year than usual, had developed the infant-killing poisons a few weeks before the ordinary time.

The deaths of adults however, as in all previous years, vary very little according to the season; the weekly rates, being for the same months and years as follows:

	1868.	1869.	1870.
May .....	25 .....	21 .....	33
June .....	26 .....	27 .....	24
July .....	30* .....	23 .....	24
August .....	28 .....	22 .....	17
September .	20 .....	21 .....	24

\* Or, omitting sun-stroke, 23 only.

If we take an average week of the three summer months, we find the following marvellous difference between the deaths of children and adults:

	1868.	1869.	1870.
All above 12 years 28 .....	24 .....	22	
All under 12 years 106 .....	71 .....	123	

Among the adult population, both high and low weeks are to be found, without assignable cause, in most of the months; and the extreme range of variation is only from 14 (week ending August 27) to 39 (week ending May 28): i. e., one in the autumnal week to three in the spring; neither extreme of heat or cold seriously affecting the health of the adolescent and adult inhabitants. But among the children, the winter weeks are uniformly low, and the summer ones high; while the variation extends from 28 (week ending Dec. 24) to 158 (week ending June 25). That is to say, six infants died at midsummer last year in our city to one at Christmas; twelve more children died in the midsummer week than during the whole month of November; and seven more than an average week of November, December, January and February added together.

If the children's death-rate of the three summer months had continued during the whole year, we should have been robbed of 7,648 children, which is far greater than the total number of births. If, on the other hand, the winter rate of dying had continued through the year, only 2,145 deaths would have taken place, notwithstanding our bad drains and ventilation, the severity of the climate, and the alleged dangers of winter baptism. We should have saved the lives of 1,472 children who actually died this last year; and of 5,503 who would have died, had the summer rate continued through the year.

On making the same calculations for adults, the summer rate of dying, if continued through the year, would have killed 1,420; the winter rate, 1,407; making a difference of only 13, or about one death per month between the two extremes of climate.

The total number of children's deaths recorded during 1870 was 3,617, against 2,778 in the previous year, making an increase of 839, of which only a small portion can be due to increase of population. The number of births during the same period cannot be stated with accuracy, since to this day there is no public system of registration. There are now four congregations of Protestants who refuse to practice infant baptism; not to speak of others who neglect the rite through carelessness or conscientious scruples; nor of clergymen who neglect to make returns at the appointed time.

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1,308, being an increase over the previous year; but with the total

The total number of deaths during the year of 931 over the only 83 over the even without a tion. If the 133,834, according would give 36 1,000, against 3 396 in the sun- ages are only previous years, error are supposed await the correction.

Far more important than the proportion of All children born right to live; estimate, till 70 we were not able of the ages at death and perseverance Council have at the tabulation of Dr. L. has undertaken classifying the race, religion, means he has actually the proportion which are born in suburbs; and the different nationalities. Into these do not intend population have confine our attention to deaths at different tertiary returns, amounting to 3 figures having 1 weeks, while the to Dec. 31st.

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It follows that tried to our cemeteries NEARLY ONE HALL lived a single year two years; 4 per cent not four; and 1 total, out of every healthy outskirt crowded centre reached their fifth ever, the children all but those of being been already 154 deaths, be 70 " 100 "

1,308, being an increase of 92 over the previous year; but a decrease of 10 as compared with the total for 1868.

The total number of deaths of all ages during the year was 4,925, being an increase of 931 over the previous cool year, but of only 83 over the sunstroke year before (1868), even without allowance for increase of population. If the population be calculated at 133,834, according to the previous rates, it would give 367 as the gross death-rate per 1,000, against 313 in the cool year 1869, and 396 in the sunstroke year, 1868. These averages are only useful for comparison with previous years, to which the same causes of error are supposed equally to apply; and await the correction of the forthcoming census.

Far more important is it for us to consider the proportion of deaths at different ages. All children born must die; but all have a right to live; according to the psalmist's estimate, till 70 years. On former occasions, we were not able to present exact accounts of the ages at death; but thanks to the labor and perseverance of Dr. Larocque, the Council have at last granted ruled forms for the tabulation of its cemetery records, and Dr. L. has undertaken the laborious task of classifying the returns according to age, sex, race, religion, disease and ward. By this means he has been enabled to ascertain exactly the proportion of city interments which are brought from extra-municipal suburbs; and the relative deaths among the different nationalities and districts of the city. Into these interesting particulars we do not intend to enter till the returns of population have been presented; but shall confine our attention to the proportion of deaths at different ages in the total cemetery returns. The difference in totals, amounting to 31, arises from all the previous figures having been calculated according to weeks, while the following are from Jan. 1st to Dec. 31st.

It appears that, including 233 who ought to have lived but never breathed, there were no fewer than

	2,396 deaths in the first year of life,
	627 " second,
	219 " third,
but only	90 " fourth,
and	50 " fifth.

It follows that, of every hundred coffins carried to our cemeteries, no fewer than 49 i.e. NEARLY ONE HALF, contained infants who had not lived a single year; 12 per cent had not lived two years; 4 per cent, not three; 2 per cent, not four; and 1 per cent not five: making a total, out of every hundred deaths, from the healthy outskirts as well as the swamps and crowded centres, of sixty-nine who had not reached their fifth year. From that time however, the children become unusually healthy, all but those of stronger constitutions having been already killed-off. There were only 154 deaths, between 5 and 10 years of age; 70 " " 10 and 15 " " 100 " " 15 and 20 " "

That is, only 7 per cent of the total deaths, for the whole period of childhood, youth and adolescence, from five years to twenty, although the epoch for unripe fruit, puberty and evil passion. The decades of mature life from 20 to 70 give 282, 212, 166, 166, and 129 respectively: making a total of only 19 out of every hundred deaths for the whole period of active manhood from 20 to 70 years. There were 178 deaths between 70 and 80; 84 between 80 and 90; and 24 above 90; making a total of only five out of every hundred who may be said popularly to die of old age. Even out of this number, a large number are from hospitals, and belong to other parts of the country

As in former years, a sad proportion of the total deaths of children were from the foundlings under the care of the Sœurs Grises. Of these victims of parental sin there were 662, a number in excess of any previous year. Only two of these were above five years of age; and only 39 of the remainder had kept the breath in their bodies for more than a year; of the remainder, 369, more than half the total number of deaths, could not maintain life a single month. The number who died in the first week however, was only 18.

The total number of foundlings received was 668, against 676 in the previous year. Of these, 385 were born in the city, being a decrease of 70 from the preceding year. The remaining 283 were born in:—

Quebec City.....	128
Ottawa City.....	33
St. Hyacinthe City.....	28
Three Rivers City.....	5
Country round Montreal.....	36
Upper Canada.....	19
United States.....	32
Old Country.....	2

The sad condition of neglect in which these "unwelcome children" were received from their unnatural parents is shown by the following table:—

Naked.....	31
Unwashed.....	104
Wounded by instruments.....	32
Umbilical hæmorrhage.....	101
Hæmorrhage of the lungs.....	33
Tainted with syphilis.....	120
Sick.....	210
With ordinary care, only.....	16

668

When even under the best circumstances, there is but a poor hope for the life of children not suckled by their mothers; for children received in such wretched conditions, and fed only in the indifferent way described in the Report of the City Health Officers for 1868, there remains only the remotest chance. The respectful thanks of the community are due to the good Sisters for the faithful kindness with which they perform their most loathsome task; but the sternest reprobation, for an unnatural crime amounting almost to murder, is due to the fathers and mothers who thus hide their shame by consigning the fruit of their own bodies to

almost certain death. It remains to be told, even of the ordinary infants in our city, how many yield to the deadly influences of the summer because of the licentiousness, the drunkenness, and the other crimes of their parents.

The result of this rigorous analysis, therefore, clearly sets forth (as we have shown before from less complete data) that while Montreal has unusual natural advantages, and is by no means (comparatively) an unhealthy city for older children and adults, its influences are fatal to young infants to an extent beyond anything known in the old country, or in any of the Eastern cities. It further appears that *these fatal influences are quiescent during the severe frosts of winter, conspicuous during spring and autumn, but particularly virulent during the summer months, and always varying in intensity according to the heat.*

It has been the main object of the Sanitary Association during the five years of its existence to direct public attention to these facts; to ascertain their causes, as far as possible; and to press them on the attention of the citizens generally, and the Council in particular. We believe that we have, to a considerable extent, succeeded in our most unwelcome but necessary task. Our oft-repeated facts are now generally accepted by the writers in the public press, even by those who take care to disconnect them from our Association. In the Council there has been, during the five years, a very marked and even rapid growth of sentiment in favour of our principles. From the officers of our governing body, and from the Health Committee, we have received constant urbanity, and even unexpected proofs of confidence; and although, of course, there have been individuals who have not looked with favour on our movement, their opposition has grown less serious, while the positive action of the Council in right directions has sensibly and often unexpectedly increased.

During the past civic year, the Health Committee and the Board of Health held six meetings for business, besides one at which there was no quorum. The following were the principal transactions of public interest:

March 23, 1870.—Action of Road Committee approved in contracts for scavenging; account to be kept of manure sales from the offal-cemeteries. March 29.—Drs. Larocque and Dugdale appointed Health Officers, with salary of \$500 each. Sub-Committee appointed to draft by-law on prostitution. Badge appointed for Sanitary Police; and days for removing offal. June 17.—Gentlemen appointed to arrange the public bathing places at the East and West ends. [Mr. Weaver gave his gratuitous labours, as in former years.] The scavengers ordered to employ more men. Application to Council for dry earth to be carted to the offal-cemeteries. Nov. 15.—Complaints received from proprietors and residents at Point St. Charles against the offal-cemetery; sub-Committee appointed to attempt its removal to the

Lower Lachine Road. Petition received complaining of tannery in Canning street. Dec. 22.—The offal-cemetery sub-Committee reported unable to obtain another lot. 384 cases reported in the Recorder's Court during the year, and \$496 imposed. Scavengers' work having been badly performed, to be fined \$250 from contract. Inspector of Buildings to take legal measures to abate the tannery nuisance. Jan. 16, 1871.—City Attorneys to frame a by-law compelling manufacturers to consume their own smoke. City Surveyor to report on the position, cost, &c., of two or more ventilating chimneys for the sewers, and to report on the same at his earliest convenience. City Attorneys to prepare by-law compelling all medical men to make quarterly returns of children vaccinated.

The first meeting of the Sanitary Association was convened by Alderman Rodden, Chairman of the Finance Committee; and presided over by Alderman Alexander, Chairman of the Health Committee. Alderman Rodden wished the Association to understand that he had long been doing in the Council what they had been contending for. He suggested that they should not present memorials to the Council, but confine their labours to personal hygiene, and similar subjects on which all were agreed. He deprecated publishing statements about the great mortality of the city, lest it should depreciate property, and lessen the number of visitors. M. P. Ryan, Esq., M.P., and Treasurer of the Association, justified its proceedings, and administered an impassioned rebuke to the Chairman of Finance for having refused the appropriation for carrying out the scavenging by-law. The Secretary reminded Alderman Rodden of the recent execration which the whole civilized world had pronounced on the murder of a few persons in Paris; and insisted that the guilt of manslaughter rested on all who allowed these hundreds of children to die every summer month, if their lives could be saved by the judicious bestowal of money and labour. Alderman Alexander ended with an appeal to his brother Alderman to grant the money for scavenging; and apparently his appeal was in part successful.

During the first half of the year, the meetings of the committee were irregular, in consequence of the great pressure of other business which lay on each of the active members. Two of the Secretaries and one of the Vice-Presidents, however, were in continual communication with officers of the Council, and a large amount of important work was done which does not appear on the minutes.

During the autumn, the Hon. C. Dunkin requested the co-operation of the Association in preparing for the approaching census. Great toil was given by some of its officers, in conjunction with other gentlemen, in a work which materially affects the sanitary interests of this city; and we have reason to know that our labours met with approval at headquarters. Situations of great trust were tendered to two of our leading officers. One

of these, who whole of the E of Canada, wa dent, G. W. W supporter of appointment to forego poli a work of great

Additional n of diffusing in articles in the reason to know weight with th take a sanitary other leading o tance of such a overestimated; remain in abeyan to enter into de

During the taken with a v various plans i where, for the dwellings. Th Hall having be pose, a circular ested to a meet vice-president v be attached to t putation which ciation had obtai sen the attenda sidered so succe week to week March 29th, (ac Witness,) it was seconded by Mr "That this mee meeting of the S view of reorgan basis of a subsc carry out the p ciation."

Meanwhile, on ed a similar mee which also adjou and for some we meetings were h were fully report advantage of th public attention cannot fail to b fresh practical k was very meagre that scarcely a p some gentlemen contrary ought t carrying off foul bottom. Some w as breathed; wh man would carry into another, and to economize hea as water becom would be purified a house! In dra water-closets; o privies. Some w sewers; others in imprison the bad

of these, which gave the control over the whole of the English population in this part of Canada, was accepted by our Vice-President, G. W. Weaver, Esq. As he was not a supporter of the present Government, his appointment was an evidence of their desire to forego political objects, in accomplishing a work of great public utility.

Additional means have been afforded to us of diffusing information, by the insertion of articles in the Canada Year Book. We have reason to know that one of these has had weight with the Government, in deciding to take a sanitary census of this among the other leading cities of Canada. The importance of such a census to this city cannot be overestimated; but, while the arrangements remain in abeyance, it would be premature to enter into details.

During the past winter, measures were taken with a view to collect and discuss the various plans in use, in this city and elsewhere, for the ventilation and drainage of dwellings. The use of the Natural History Hall having been kindly granted for the purpose, a circular was issued inviting all interested to a meeting on Feb. 10th. The acting vice-president would not allow any name to be attached to the circular, lest the bad reputation which he considered that the Association had obtained in the city should lessen the attendance. The meeting was considered so successful that it adjourned from week to week; till at the last meeting, held March 29th, (according to the report in the *Witness*;) it was moved by Dr. J. B. Edwards, seconded by Mr. S. J. Lyman, and carried "That this meeting do adjourn to the annual meeting of the Sanitary Association, with a view of reorganizing that Association on the basis of a subscription membership, and to carry out the proposed objects of that Association."

Meanwhile, one of our Secretaries convened a similar meeting at the Union St. Joseph, which also adjourned for further discussion; and for some weeks, both English and French meetings were held in the two halls, and were fully reported in the daily papers. The advantage of this movement in directing public attention to these important subjects, cannot fail to be great; but the amount of fresh practical knowledge eliminated at them was very meagre. It was remarkable to find that scarcely a plan was recommended, but some gentleman insisted that exactly the contrary ought to be done. Some advocated carrying off foul air at the top, others at the bottom. Some would remove bad air as soon as breathed; while one intelligent gentleman would carry the used air of one room into another, and thence to a third, in order to economize heat; under the impression that as water becomes filtered by flowing, air would be purified by circulating up and down a house! In drainage, some recommended water-closets; others, earth-closets; others, privies. Some would drain these into the sewers; others into porous pits. Some would imprison the bad air of the pits; others would

let it off by a shaft into the neighborhood of the dwelling. Some would trap the house drains to keep out the sewer gases; others would tempt these up the spouts to thaw the ice, at the risk of their entrance at the attic windows.

One practical effect of the meetings, however, was an invitation kindly given by Dr. Howard to inspect his arrangements for ventilation at the Provincial Lunatic Asylum at St. Johns. All the gentlemen who examined his plans in operation seemed impressed with the very great difficulties which he had had to encounter, in consequence of the most unsuitable building provided by the Government; but also with the very great success with which he had mastered these difficulties.

While these meetings were in progress, a fresh necessity appeared for immediate action in consequence of Messrs. Paton and Copland having made excavations for building on the most crowded part of the old Catholic cemetery. The desecration of this ground, the raking out of part of the bones, the burial of the rest of the fetid remains, and the burning of the coffin boards in private houses in the lower city, had, in 1867, met with earnest remonstrance on the part of this Association, as detailed in our second annual report for 1868; but the efforts then made to induce the Council to prevent further excavations for dwellings by purchasing the land for a public square had been rendered futile for the time; though, as it appears, the proposal was never formally negatived. On information being received of violent stench arising from Mr. Paton's excavations, the secretary, assisted by Mr. S. J. Lyman, set on foot a requisition to the Mayor requesting him to call a public meeting of the inhabitants to consider the propriety of purchasing the ground for a public square. This requisition was headed by the Metropolitan, the two last ex-Mayors, several of the most distinguished clergy, physicians, and other leading citizens, and in three days received nearly 900 signatures, representing all our nationalities and religious bodies. The meeting convened by the Mayor was crowded, and passed unanimously the following resolutions:

1. Moved by the METROPOLITAN, seconded by the Rev. Dr. WILKES,

That whereas the old Catholic Cemetery in Dorchester street was, until 1854, the burial place for the principal part of the inhabitants, and is now being sold for building purposes, it is desirable, out of respect to the memory of the dead, and regard to the health of the living, to secure possession of the land for the public welfare.

2. Moved by Mr. GEO. MACRAE, seconded by Mr. WM. CLENDINNING,

That, in order to prevent building, which has actually commenced, the City Council be earnestly requested to take immediate steps to expropriate the land in which interments have taken place for a Public Square.

3. Moved by Dr. HINGSTON, seconded by Rev. Dr. JENKINS, and supported by Rev. J. CARMICHAEL,

That, as the interments were made from every part of the city, it is fair that as large a proportion of the expense as possible should be borne by the city generally.

4. Moved by Dr. T. STERRY HUNT, seconded by Mr. HENRY LYMAN,

That the following gentlemen, Messrs. N. Valois, E. Murphy, H. Starnes, H. Lyman, E. Atwater, W. Murray, W. Clendinneng, Drs. Smallwood and Sterry Hunt, Revs. Dr. Jenkins and J. Carmichael, be a deputation from this meeting to confer with the Council, and to take such measures as shall insure the immediate carrying out of the above resolutions.

An amendment extending the object of the meeting to the three other unused cemeteries was lost, simply from a fear of losing what was of most pressing importance by attempting too much. While the conduct of the Fabrique in thus selling land charged with human remains for building purposes, and of the gentlemen who have purchased from them, has met with strong expressions of disapprobation in the public journals, it is consoling to place on record the conduct of the owners of the Emigrants' Fever Cemetery at Point St. Charles. They not only railed it in and erected a monument at their own expense, but they have transferred the ownership to the Metropolitan that it may remain consecrated for ever to the memory of the six thousand victims of the Irish famine and fever of 1847-8, who hoped to have made Canada their home, but who set foot on our shores only to die.

At this very date the exhumation case is pending before the Recorder's Court; the City Health Officers and Attorneys, as well as one of H. M. Ministers, have given their opinions on the subject; the Board of Health has unanimously recommended the Council to buy the land for the public good; the Mayor has promised to convene a special meeting of the Council; and there are good grounds for hoping that this difficult subject will speedily be arranged in the interests of the public health, and to the satisfaction of the citizens generally.

A. B. LAROCQUE, M.D.,  
P. P. CARPENTER, B.A., Ph. D.,  
R. J. WICKSTEED, B.A.,

*Hon. Secretaries.*

On the motion of Mr. T. S. BROWNE, seconded by Dr. WANLESS (City Health Officer), the Report was unanimously received and adopted.

The balance sheet of the Society was not presented, in consequence of the absence of the Treasurer, M. P. RYAN, Esq., M. P., at his parliamentary duties. It was understood that no collection had been made for some years, and that there was a balance due to the Treasurer.

The CHAIRMAN understood that there was a deputation from another meeting in the room, and called upon them to state their views.

MESSRS. MERRY, T. S. BROWN and Dr. WANLESS explained the wishes of the deputation.

The CHAIRMAN suggested that a sub-committee of four members from each body should meet and report to an adjourned meeting.

After some discussion, the following gentlemen were appointed: From the Sanitary Association, Messrs. W. WORKMAN, President, T. S. BROWN, Vice-President, R. J. WICKSTEED and Dr. LAROCQUE, Secretaries; from the meeting convened by Mr. Brown, Drs. FENWICK and J. B. EDWARDS, and Messrs. MERRY and T. S. BROWN.

The members of the sub-committee thus appointed having met at the Natural History Rooms, April 17th, and agreed upon their report, the

#### ADJOURNED ANNUAL MEETING

was held at the same place, April 20th, pursuant to public advertisement.

In the absence of the President, from indisposition, the chair was taken by T. S. BROWN, Esq., Vice-President.

Mr. MERRY read a report of the sub-committee, recommending that the "Montreal Sanitary Association" and the Builders' Committee should form a joint "Social Science and Sanitary Association," for the government of which an elaborate Constitution and By-laws were prepared.

Considerable discussion arose on the details; but on the motion of Dr. WANLESS, seconded by Mr. C. G. JONES, the report was received and adopted.

It was moved by Dr. LAROCQUE, seconded by Dr. TRENHOLME, and carried,—“That Mr. W. WORKMAN, President, Mr. M. P. RYAN, Treasurer, and Dr. P. P. CARPENTER, Secretary, be a sub-committee for winding-up the affairs of the Sanitary Association.”

The meeting then resolved itself into the first meeting of the new Society. As the basis of this was the payment of a dollar, Dr. Carpenter tendered the first payment, and was followed by the other gentlemen present. Most of the active members of the old Society were elected to office in the new, but of these Dr. Carpenter, Dr. Larocque, and (subsequently) M. P. Ryan, Esq., declined to serve. Dr. J. B. Edwards also declined to serve on the Council.

The next meeting was fixed for April 27th, but no further proceedings have as yet been made public.

Montreal, May 24th, 1871.

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## PRACTICAL SUGGESTIONS

ON THE

# Ventilation and Drainage of Canadian Dwellings.

BY

PHILIP P. CARPENTER, B.A., PH. D.

Hon. Secretary of the Montreal Sanitary Association.

The substance of this article was read before a meeting of architects, contractors and gentlemen interested in building, convened by the Sanitary Association at the Natural History rooms, Feb. 20th, 1871.

1. The hardy settlers in our clearings generally enjoy excellent health. The log-houses admit abundant air, which is warmed with an unlimited supply of fuel. The drainage is disinfected, in winter by the frost, in summer by the earth.

2. The old houses in our cities were not remarkable for the close fitting of the carpentry. They therefore had the benefit of ventilation by drafts. The inmates rarely suffered from bad drains opening into dwellings, for the simple reason that inside drainage was not thought of. The surface of the streets and yards received the fluid refuse; an arrangement fraught with fewer evils than at present, because the wind had freer access.

3. Under the existing system of competition, our rapidly built houses must have all the "modern improvements"; i. e., besides following the fashion in matters of appearance, they must have bath and water-closet, sink and drain, and the carpentry and plaster must make them as nearly air tight as possible. At the same time, the cost of wood is leading to a general consumption of coal; the emanations from which are far more injurious to health. At the first cold spell of winter, most persons carefully close all places where cold air can enter; and these continue closed throughout the whole season. The sulphurous and carbonic emanations from the stoves, therefore, are carried over the house in the heated currents; and descend cooled, only to be heated again, with the addition of fresh effluvia. At the same time wooden and other porous drains absorb the decomposing excreta underneath the basement; and the poisonous gases, abundantly generated in the sewers at high pressure, (the gully-holes being generally frost-bound,) force their way through imperfect traps, up the sink and soil-pipe, or through the boards of the floor and the soft plaster of the walls, and invade the dwelling; perhaps carrying the germs of infectious diseases in their train.

4. In the construction of all new buildings, it is the imperative duty of all architects, contractors and proprietors, as well as of the municipal authorities, to see that effective measures are planned and carefully executed to secure to the inmates the fresh

air which is an essential requisite for life and health.

5. Even if good ventilation and drainage were very expensive, they ought to be ensured, at whatever sacrifice to the elegance of the building. But, happily, all the needful arrangements can be carried out, in the first building of a house, at so trifling an extra cost, that their neglect is totally inexcusable. To introduce such arrangements, however, into a house built without them, is generally a very difficult, unsatisfactory and expensive process.

### WINTER VENTILATION.

6. Health and comfort require a constant supply of fresh heated air, and the withdrawal of an equal amount of vitiated air. Hot water and steam pipes or plates have the advantage of avoiding the gases which always escape through red hot iron; and steam is naturally a favourite, from the rapidity with which any room can be rapidly warmed; but unless fresh air be introduced under the coils and plates, the bad air of the house is circulated over and over again. The common mode of heating, by a hall-stove or furnace, makes it easy to introduce the fresh air in one volume, by a pipe or wooden flue from outside, arranged so as to discharge under the heated surface. Care must be taken to isolate this flue (which may occasionally be cooled to  $-20^{\circ}$  or lower) from all connection with water, soil and gas pipes, lest they freeze.

7. In order to prevent the heated air from accumulating over staircases and other useless places, while living rooms are left chilled, a system of air holes, at least one foot square to allow of rapid circulation, should be arranged over doors and in other convenient places, as near the ceiling as possible. These should not only connect each room with the hall or stair, but should make a circulation round each storey, not far from the outer walls. It is best to leave the air holes open; but they may be regulated by Venetian shutters, or screened by pictures.

8. With this provision for a constant supply of fresh heated air, and for its steady circulation through the whole house, the carrying off of the bad air becomes a comparatively easy matter. Without this uniform fresh supply, even with the best ventilating arrangements, houses are liable to down currents from chimneys and air flues, and drafts from all quarters. But with it, the inside air wants to escape, and will do so through the easiest channels; porches and window spaces

are filled with tempered air; and the balance of pressure is always outwards.

9. Every new house should have a glazed tile-pipe smoke-flue fitted inside the ordinary brick chimney. This is worth the trifling expense, if only to prevent the accumulation of soot (which falls to the bottom), to lessen the danger of fire, and to increase the draft. The spaces between the brick and the pipe furnish the very best bad-air-escape flues; the draft being always upward, from the heat of the pipe, while there is no danger of the contents of the smoke-flue entering the room. A single glazed pipe will afford an escape flue on each side; a central chimney, enclosing two pipes, would furnish four. The builder must exercise constant oversight, else the bricksetter will close these openings with rubbish.

10. If openings are made from the rooms in each storey into these flues at convenient heights, the needful work is accomplished. If desired, they may be provided with cast-iron or porcelain ventilators, or covered with perforated zinc. No harm however will follow, if they are left always open. When they can be opened and shut at pleasure, ignorant tenants often shut them at the first cold wind, and do not open them afterwards.

11. Care must be taken that the principal bad-air-escape flues open against a smoke-pipe always heated; else, in cold winds, the action may be impeded, or even reversed. The exit of the flues should be on the least exposed side of the chimney-stack; and, if needful, protected by a shade.

12. Chimney-blocks are now made in solid layers fitting over each other; each layer containing the smoke and air flues. These can be ordered of any required dimensions, with openings at any desired height. The layers are sent numbered, so that the whole chimney is erected rapidly and cheaply.

13. There are two opinions among practical men as to the proper height above the floor for the escape flues. According to Dr. Howard's experiments, the greatest amount of expired carbonic acid is to be found from 8 to 10 feet high. Here then the flue ought to open. It is objected that carbonic acid, being heavy, ought to fall to the bottom, as it does in old wells. But hot carbonic acid from the lungs is lighter than cold common air; and the tendency to diffusion in all gases, as well as the attraction of the moisture, which rises with it from the lungs, aid in keeping the carbonic acid in suspension. Moreover the light hydrocarbons which are constantly passing from the lungs and skin, may be more injurious to health than even carbonic acid. The wretched air in galleries of theatres and churches, is always most offensive at the highest point.

14. On the other hand, when very hot air is rushing from a stove or register against the ceiling, the cooler human gases are forced downwards; and it would be strange economy to carry off the pure hot air before it had been breathed through or allowed to warm the room below. Therefore the maxi-

mum of bad gases may be expected to vary according to the heat and height of the room, the rapidity of the circulation, and other causes. Builders should therefore provide both upper and lower vents, which may be used together or separately according to varied conditions. When there is a grate, the chimney answers sufficiently well for the lower escape flue.

15. When gas is used, there should be an escape flue in the ceiling, if possible directly over the burners. It may be inserted in the usual plaster ornament, and moderated with perforated zinc. The products of combustion are so injurious and insidious that the risk of their descent into the breathing stratum should be carefully avoided. If connected with an escape flue, the burning of gas materially increases the ventilation of the room.

16. In every case the chief escape flue should be made from the water-closet. There is scarcely one house in a hundred provided with this cherished convenience, even though there be a shaft connected with it, in which injury does not result to the health of the inmates.\* As the closet, with its cistern, has to be protected from frost, and generally opens into the interior of the house, the bedrooms are specially liable to be poisoned from it. If there is a closet in the basement, every time the door is opened a flood of fetid air rises through the whole house. No amount of flushing or trapping suffices to ease this fundamental evil of modern houses, which becomes all the more serious in proportion as the woodwork of the house is more accurately constructed to avoid external drafts. There is no known cure except by forcing the air of the house outwards through the closet. The water-closet escape flue, therefore, should be connected with the warmest chimney, and should have two openings, one below the seat to carry off the bad air which is always generated round the pan and pipes; the other above, to carry off the gases from the body. It is possible, and very advantageous, to make the closet carry off most of the bad air, as well as the bad water of the house, in which case it may be placed anywhere, and even the doors and lids left open, without injury to health. To erect a water closet without a self-acting escape flue for the air, is to tempt disease into the house.

#### SUMMER VENTILATION.

17. The external conditions being now reversed, and the external heat being often greater than that within, the arrangements, which are perfect in winter, will often be found insufficient. Even when all the doors and windows are open, there is frequently such a stagnation of the air, that the smells from the closet, drains and bed-rooms, hang about unable to escape. At those times it is

\* NOTE.—The late dangerous illness of the Prince of Wales is attributed to the emanations from a water-closet which opened into his bedroom at Lord Londesborough's Hall.

often necessary by heat or mechanical small jet inside kept burning without question. Where ordinary required current closet, the most the St. Johns worth its cost fan moved by wound up one from the closet would be incoincidence (to be closed) with advantage.

18. Some always be English advantage of lation. The freely, and the air of the convenience is the sashes be the top or the by a very simple never be omitted old arrangement strip of wood, if required) be side of the sash. In making appearance) let inches higher than sash may drop low. Then, by of the top of it into the room two sashes, which frame excludes air, being forced without draught into bed and sitting. 19. A plate taking the place is often beneficial desired, into a hinges below, a rent upwards, in winter by in cotton wool.

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often necessary to create artificial currents by heat or mechanism. Where gas is used, a small jet inside the ventilating flue may be kept burning. The escape flues should now, without question, be at the top of the rooms. Where ordinary means do not ensure the required current, especially through the water closet, the mode adopted by Dr. Howard at the St. Johns Lunatic Asylum will be found worth its cost. This consists of a circular fan moved by machinery, which has to be wound up once a day. A perpendicular shaft from the closet, through the roof, which would be inconvenient (and therefore liable to be closed) in winter, may now be used with advantage.

## WINDOWS.

18. Some at least of the windows should always be English sashes, which have the advantage of allowing graduated ventilation. The top should *always* move freely, and be drawn down whenever the air of the room requires changing. Inconvenience is often felt from drafts, though the sashes be open ever so little, whether at the top or the bottom. This may be avoided by a very simple expedient, which should never be omitted in fresh erections, or when old arrangements need alteration. Let a strip of wood, say two inches broad (or more, if required) be set flush against the lower side of the sash *inside*, as part of the frame. In making new windows (for the sake of appearance) let the frame below be made two inches higher than usual, so that the bottom sash may drop so much deeper into the hollow. Then, by raising the sash to the level of the top of this ledge, the air is admitted into the room in the middle, between the two sashes, while the two-inch extra of the frame excludes it from below. But this *mid-air, being forced into an upward current*, enters without draught, and may be freely admitted into bed and sitting rooms.

19. A plate of perforated glass or zinc, taking the place of one of the top squares, is often beneficial. This may be fitted, if desired, into a triangular frame, working on hinges below, and thus discharging its current upwards. The current may be modified in winter by charcoal in fragments, or even by cotton wool.

20. During the winter season there are often times when more fresh air is wanted than can enter through the usual slits or loose panes. This is easily provided for by making at least part of the winter windows of French sashes, working on permanent frames. These can be opened or shut at pleasure, and be replaced in summer by Venetian shutters hanging on the same frames. Inmates need not fear a sudden passage even of very cold air through the rooms, *providing it occupy a few moments only*; and providing the walls have been previously well heated. The cold air, impinging on the hot surfaces, and rapidly circulating, soon becomes of an agreeable temperature. A few moments of this rapid change should be practised daily before making the beds; the

clothes having been previously thrown completely open. In schools and workshops this rapid, complete change, should frequently be made.

The above suggestions will provide for ordinary wants—1. in extreme cold; 2. in extreme heat; 3. in the long periods of spring and autumn, during which there are rapid alternations of temperature.

## DRAINAGE.

21. The use of wooden box drains, to convey the refuse of dwellings, is the constant source of the most dangerous diseases, as well as of chronic ill-health. It ought to be absolutely prohibited under heavy penalties. Any contractor, owner, architect, or other person privy to the laying down of such drains, may be guilty of *unjustifiable homicide*.

22. Brick house-drains are also injurious from the porous nature of both brick and mortar; and from the friction of square and uneven surfaces.

23. All house-drains ought to be of glazed tile, round or oval, and should be laid, with the greatest care, to allow of an equable fall during the whole length, and with the fewest possible angles. The joints should be fitted with great precision. As workmen seldom understand the importance of this work, and their errors are hidden from sight, it becomes the duty of builders to see the drains laid under their own eyes, as a solemn religious work, on which the lives and health of the present and succeeding generations may depend.

24. The tiles should be laid on a plank, to secure uniformity. The bed may be filled with stones, to allow of escape for the natural drainage. A similar stone drain should be laid round the inside of the basement wall. It is well to cover the whole basement floor (under the boards) with concrete, to keep out damp and rats.

25. An S-trap should be carefully fitted at every place where the drains communicate with the house. If there is sufficient fall to prevent the danger of choking, there should also be an S-bend, after leaving the house branches, before entering the street sewer, to prevent the influx of sewer gases. These are frightfully poisonous; and in winter, when the ordinary escapes are frozen up, they force themselves into the higher levels of the city, and have power to penetrate even through the S-bends, like gas generated in a retort. Whether or not this out trap is deemed advisable, a flue for the easy ascent of whatever gas remains in the drains should always be arranged, in order to prevent escape into the house. A branch drain-pipe, communicating with the chimney, will answer the purpose; but it is better to isolate it in one of the flues between the glazed and the brick chimneys.—See Nos. 9—12.

26. It is a common practice to empty the down-spouts from the roof into the drain. This is useful in flushing the drain, and in carrying up the bad gases. The latter keep the down-spouts from freezing in winter.

But the plan is liable to one very grave objection, viz, that the open tops of these spouts are often below the level of the attics, and even near the windows. Thus the street sewers are encouraged to discharge their poisons into air that has to be breathed through the night. The exit-flue for sewer gases must, therefore, always be carried above the level of the attics, and at a distance from the windows.

#### EXCRETA.

27. It can scarcely be doubted that the earth-closet is the best mode for collecting and disinfecting the refuse of the body, provided the arrangements for supplying fresh dry earth, and for carrying off what has been saturated, can be satisfactorily made. In the meantime privies and water-closets will both be used from their easy convenience.

28. For the ventilation of closets, see Nos. 9, 11 and 16.

29. How to prevent privies from being offensive is a difficult problem. If the vault is not water-tight, its percolations necessarily penetrate the soil, and form one of the chief causes of our high death-rate. It is very rarely that they can be connected with street sewers without evil consequences. It is common to erect shafts, like short chimneys, communicating with the vaults. These simply carry off the imprisoned gases and mix them with the general air of the yard, exactly at the level at which they are likely to be breathed. Perhaps the least evil results from making the vaults as nearly air and water-tight as possible. The seats should be made with hinges, so that, on lifting them, earth, ashes or disinfectants may be frequently thrown in. The privies should be at as great a distance from dwellings as possible.

#### COTTAGE AND TENEMENT HOUSES.

30. The simple expedients here enforced, viz: A fresh-air flue discharging at the stove; a glazed pipe within the brick chimney, forming ventilating flues on each side; together with a trapped pipe-drain for the house slops, ought to be introduced into even the cheapest houses. The removal of the excreta ought to be at the cost, and for the benefit of the city, and should not be dependent on

either the owner or the tenant. The water tax should be charged on the property and the supply should not be dependent on the ability of the tenant to pay the rate for the whole year at one period.

31. It is a great sin to build any dwelling without through ventilation from front to back. The erection of fresh buildings with windows only in front should be prohibited under heavy penalties; as also building round a yard so as to stop the circulation of air.

32. In old houses, and in cases where the owners are covetous, and unwilling to do their first duty in making their dwellings healthy, tenants may obtain great relief by a few simple arrangements: 1. Let a wood or tin pipe be made, communicating with the outside, and discharging under or close to the stove, so that fresh air shall be heated as it enters. 2. Let a brick be taken out in the chimney, to allow foul air to escape. If the smoke returns, cover it with wire gauze or perforated zinc. Dr. B. Edwards has invented a simple plan, by which a T-bend is used, instead of the usual elbow joint of the smoke flue. The open arm of this, protected by a self-acting valve, carries the foul air directly into the chimney. Another plan is to make the chimney hole larger than the flue, so that the foul air may be carried off round the heated stove-pipe.

33. The main principles for health and comfort are to bring in fresh air, heated at the stove, and to carry off what has passed through the lungs. The application of these principles will vary continually; but brain-work, a little time and trouble, and a very few dollars, will generally suffice to make the necessary provisions.

34. To replace all box drains by glazed tile, and to prevent throwing slops on porous soil, is the special duty of every house owner. A man's religion is not worth much if he injures the health of his tenants in order to save a little money or to avoid taking trouble.

35. If any children, through our neglect of the known laws of health, fall sick and die, their blood will be required at our hands at the great day of judgment. If property has its rights, much more has it its duties; if we neglect these, it is at the peril of our souls.