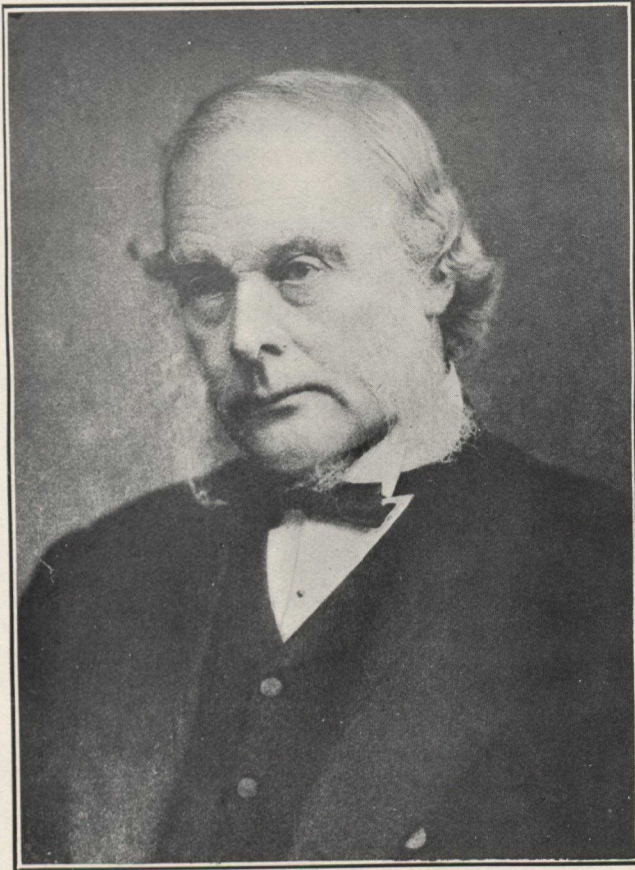


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Perhaps enough will have been said to show that the medical and surgical profession is really in an anomalous and untenable position today. Its members seek to exist by their private and individual services to individuals, as the barrister or solicitor does. But the profession of healing has another function to which that of the law offers no parallel. It has a branch of science in its keeping; and the time has very nearly if not wholly passed when a practitioner, such as was Joseph Lister, can, simultaneously with the practice of his profession, institute biological experiments, which transform one of the major facts of human life. The public and the philanthropic and the state must learn that the time has come when competent men must be supported in decency and certainty whilst they discover the natural facts and laws upon which the future progress of medicine and surgery depends.

—C. W. Saleebly, M.D., F.R.S.E.



The Late Lord Lister, P.C., O.M., F.R.S.

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Special Articles

PHYSIOLOGICAL OBSERVATIONS ON MEN'S WEARING APPARATUS FOR SAVING LIFE IN MINES

BY DAVID FRASER HARRIS, M.D., D. Sc., B.Sc. (Lond.), F.R.S.E.,
PROFESSOR OF PHYSIOLOGY AND HISTOLOGY, DALHOUSIE UNIVERSITY, HALIFAX, N.S.

The tests described were carried out in the experimental mine of the University of Birmingham, during the years 1909-11. The persons who volunteered to undergo the tests with the rescue apparatus were members of a committee of the South Staffordshire Coal Owners' Association. They are designated by letters thus:

	Kilos.
Weg. No. 8	20.1
Weg No. 9	20.3
Meco No. 4	17.5
Meco No. 5	17.6
Fleurs No. 6	18.5
Fleurs No. 7	18.7
Aerolith (empty)	8.0
Aerolith (full)	11.0

I. General Remarks.

It was distinctly understood that the chief object of the tests was to ascertain the relative fitness of various forms of apparatus designed to permit the breathing of compressed gas, and not to undertake a physiological examination of the men wearing the apparatus, nevertheless, since the success or failure as regards the saving of life in mines depends on certain physiological factors, it would have been absurd to investigate the instruments without also studying the condition of the men inside them.

The experimenters were all men in good health and capable of doing hard manual work for upwards of 1.5 hours, while wearing apparatus, the lightest of which weighed 17.3 kilos (the aerolith of 11 kilos

Subject	Height Age	Height Feet	Inches	Average Weight Kilos.
A.	29	5	9	76.5
B.	35	5	11	69.0
C.	41	5	7½	78.0
D.	26	5	9	77.0
E.	39	5	7	65.5
F.	34	5	10	76.0
G.	50	6	0	89.3
H.	34	5	9	68.5
I.	26	5	8	53.6
J.	28	6	6	89.0
K.	35	6	1¾	80.0

The weights of the apparatus as carried were as follows:

	Kilos.
Drager No. 1	18
Drager No. 2	17.3
Drager No. 3	17.3

alone excepted). We had no means of ascertaining in kilogramme-meters the amount of work done by each man during a test, but it may be stated that the following figures have been obtained under conditions where measurement was possible in Drager:

43,500 kilogram meters of work per	
2 hours, or per minute	362.50
35,000 kilogram metres of work per	
2 hours, or per minute	250.00
33,028 kilogram metres of work per	
100 minutes, or per minute	330.28

These may be regarded as maximum values.

The powers of endurance of the experimenters were considerable, as may be seen from the maximum times during which the following five types of apparatus were worn: Drager, 155 minutes; Fleuss, 135; Meco, 130; Weg, 122; Aerolith, 115.

As might be expected, the men experienced some discomfort in the wearing of the apparatus, especially those of helmet form where the lack of ventilation of the face is very trying. The face perspires profusely and no provision is made to carry off the moisture; and in those forms of apparatus with mouthpieces the flow of saliva proves troublesome.

The most exhausting atmosphere was found to be not the irrespirable, hot and moist one of the Group II., but the respirable and excessively hot and moist atmosphere of the tests of Group III. At the end of only one hour all experimenters in temperatures of wet bulb about 90 degrees F. felt excessive lassitude and disinclination to remain any longer in that atmosphere. Even those not wearing apparatus were similarly affected.

As regards the observations which follow, the experimental conditions fall into three classes, thus:

- I. *Respirable and not excessively hot or moist atmospheres.*
- II. *Irrespirable and hot and moist atmospheres.*
- III. *Respirable but very hot and moist atmospheres.*

II. *The Pulse.*

Reviewing the whole series of tests, the increment in the pulse rate was very much the same throughout the three sets of ex-

periments. Thus taking the figures for the test on May 10th, 1910 (Group I.), we have:

Subject	Pulse Rate Per Minute		Increase Per Minute
	Before	After	
J.	72	120	48
A.	68	118	50
F.	69	90	21
L.	74	120	46
G.	68	90	22
C.	72	96	24
B.	84	124	40
B.	84	104	20

Taking the following as typical of Group II. (test April 10th, 1910):

Subject	Pulse Rate Per Minute		Increase Per Minute
	Before	After	
J.	88	120	32
F.	72	104	32
C.	88	124	36
B.	86	104	18
A.	76	92	16

The following is typical for Group II. (November, 1910):

Subject	Pulse Rate Per Minute		Increase Per Minute
	Before	After	
J.	72	120	48
A.	80	100	20
J.	82	122	40
A.	68	126	52
F't.	84	126	42

Thus in the 18 cases cited, the pulse rose to above 100 in 15 of them.

In all cases the accelerated pulse had returned to its normal rate within ten or fifteen minutes after taking off the apparatus.

As was to be expected, the rate of the respiration was correspondingly accelerated, but in no case did we observe anything more than a physiological hyperpnoea. We never saw true dyspnoea in any subject even at the close of more than two hours in any of the forms of rescue apparatus.

The special cases of syncope are referred to later on page 108.

III. *The Body Temperature.*

The body temperatures were in all cases taken by a clinical thermometer placed under the tongue, the lips being closed. The thermometers used were "guaranteed half minute" instruments, but two minutes were in nearly all cases allowed to elapse before a reading was taken.

In so exceedingly few cases was the temperature lower after a test than before it, that one is inclined to believe that the lower reading is due to some incorrect method of taking the temperature, air, for instance, having been allowed to pass over the instrument.

In Group I. a typical set of readings is as follows (May 31st, 1910):

Subject	Reading*.		
	Before	After	Rise
C.	98.2	98.4	0.2
G.	97.8	98.8	1.0
F.	97.4	99.1	1.7
I.	97.0	98.4	1.4
A.	96.8	98.8	2.0
H.	97.0	98.2	1.2

Group II.

J.	97.4	99.4	2.0
B.	98.5	99.2	0.7
E.	97.7	98.9	1.2
C.	98.5	98.6	0.1
A.	97.4	98.9	1.5

In Group III. the following were recorded:

Subject	Pulse			Dry Bulb	Wet Bulb
	Before	After	Rise		
J.	97.6	100.4	2.8	98	97
A.	97.8	100.4	2.6	91	90
C.	97.8	100.4	2.6	93	92
J.	99.2	100.2	1.0	91	90
A.	98.8	99.4	0.6	90	89
F't	99.0	100.0	1.0	87	87

The highest mouth-temperatures were recorded in the tests of Group III., in which, as may be seen above, the wet bulb thermometer was exceptionally high and the air practically saturated.

All the above temperatures are those of men wearing apparatus. Three persons who were in the saturated hot air (temperatures 90 degrees F. to 98 degrees F. dry bulb), for one hour on November 15th, 1910, but had not been exerting themselves, had temperatures of 102.2 degrees F., 102.2 degrees F. and 102.3 degrees F., respectively.

That except in Group III. the increase of temperature was not greater than 2 degrees F. is undoubtedly to be referred to the fact of the profuse perspiration which occurred in every case where the experimenter did work while wearing apparatus.

IV. The Loss of Body-weight.

The wearers of apparatus were all

healthy men whose weights varied somewhat from week to week.

The losses of weight during the duration of a test were very different, ranging from a loss of 1/4 of a pound or so (153 grms.) up to 4 1/2 lbs. (2 kilos) or more: a loss of 1 lb. (about 0.5 kilos) being frequently recorded. Subjoined are some of the losses in grammes, total and per minute:

Group I. (May 10th, 1910).

Subject	Weight (Kilos)	Total Loss (Gramms)	Fraction of Body-weight Lost	Loss of Weight Per Min.
A.	56.7	570	1/99	6
F.	55.5	500	1/111	6.2
G.	88.6	226.4	1/347	1.8
C.	75.0	226.4	1/331	4.0

Group II.

Subject	Weight (Kilos)	Loss of Weight (grms)	Loss of Weight Per Min.
J.	89.0	700	6.6
E.	67.0	1250	11.0
F.	76.4	700	7.1
D.	57.0	700	8.0
G.	89.0	570	6.5
H.	69.0	340	3.1
A.	57.0	450	4.3

Group III.

Subject	Weight (Kilos)	Loss of Weight (grms)	Loss of Weight Per Min.
C.	75.0	1930.0	16.8
A.	76.5	1352.4	9.6
J.	88.0	1700.0	11.3

As might, therefore, have been expected the greatest loss in weight was experienced during the tests carried out in excessively hot and moist air.

V. Loss of Water from the Skin.

This is given by the following equation:

$$W_1 - W_2 + O_2 - CO_2 = S$$

Where W_1 = body weight before experiment,

W_2 = body weight after experiment,

O_2 = grammes of oxygen absorbed during the experiment,

CO_2 = grammes of (moist) carbon dioxide excreted during the experiment.

S = grammes of sweat lost.

If we assume that the weight of CO_2 excreted during the experiment is equal to that of the oxygen absorbed, then the sweat lost is merely the difference in the body weights before and after the experiment. But it is not strictly correct to assume this,

*All temperatures in this paper are given in degrees Fahrenheit.

seeing that under healthy conditions there is more oxygen absorbed than CO₂ excreted (i.e., the Respiratory quotient $\frac{CO_2}{O_2}$ is less than unity).

The amount of oxygen actually absorbed was not estimated, and, therefore, we cannot arrive at O₂ in the above equation by the direct method.

We might proceed on the assumption that the oxygen absorption was 1.5 litres per minute per person, which is not an accurate datum, but a safety limit for it. 1.5 litres per minute is 175 grammes per 82 minutes, the actual time of an experiment in which the CO₂ was measured.

The (moist) carbon dioxide can be found, as we ascertained the weights of the regenerators before and after each experiment, the CO₂ was excreted at the rate of 103 grammes per hour (141 grammes per 82 minutes), so that if we take a given case in which in an experiment the total loss of body-weight was 1245.2 grammes and the duration of experiment 82 minutes, we have, if 1254.2 is the total loss of body-weight, 1245.2+175-141=sweat lost=1279.2 grammes, or 15 grammes per minute.

This gives some idea of the magnitude of the loss of water from the skin, more than 1 kilogr. in a particular case; but as the oxygen absorbed was not estimated, I have not thought it well to apply to the difference of body weights, a correction which, though approximately correct, is not verifiable in each case.

In this case the correction works out at 0.4,

$$\begin{array}{r} 175 \quad 141 \\ - \quad - \quad - \\ \hline 82 \quad 82 \end{array} = 0.4$$

but as a typical correction 0.25 may be taken.

VI. The Elimination of Carbon Dioxide.

All the carbon dioxide excreted during a test was absorbed in what are called regenerators or "cartridges"—metal cases containing potassium hydrate in sticks. The gas is of necessity absorbed moist, as, of course, no provision is made to have it dried. The increase in weight in the regenerators, therefore, gave the weight of CO₂+H₂O eliminated from the lungs during an experiment.

The table below shows the actual increase of weight in grms. on six occasions taken at random:

	Weight (Kilos.)	Duration of Test (Minutes)	Increase in Weight of Absorbent (grms.)
A.	78.5	95	135.0
A.	77.7	30	52.7
B.	69.0	130	180.5
C.	76.3	98	176.4
F.	76.3	131	79.2
H.	69.2	60	107.8

Here the amounts of moist CO₂ vary considerably since the amount of CO₂ excreted varies with the weight of the subject and the length of the test. It is better to express the results as CO₂ excreted per hour per unit of body-weight, e.g., the kilo.: when this is done it is seen that the weight of (moist) CO₂ excreted in unit time per unit of body-weight is represented by a figure not greater than 2 and very rarely less than 0.5 gm. In other words, within certain pretty narrow limits, the excretion of CO₂ is the same per unit time per unit of tissue in very different individuals placed under the same rigorous external conditions.

CO₂ (moist) in grms. per kilo. per hour excreted in:

Subject	Flues	Meco	Weg.	Drager	Averages excreted by:
A.	1.30	1.12	1.13	0.86	A. 1.16.
A.		1.35			
A.				1.20	
B.	0.54	1.20	0.80	0.95	B. 0.87.
C.	1.43	1.40	{0.90 0.87	1.40	C. 1.20.
D.		1.86		1.15	D. 1.50.
E.	1.36		0.88	1.40	E. 1.21.
F.	1.67	1.03		{0.65 0.30	F. 1.21.
G.	1.32	0.70		1.43	G. 1.15.
H.	1.50	1.56		{1.34 1.20	H. 1.40.
I.		1.16	1.16	1.82	I. 1.49.
J.	1.40			1.20	J. 1.30.
K.	0.83			1.15	K. 0.99.
Average:	1.25	1.28	0.96	1.14	

Although in a number of individuals the formation of CO₂ undoubtedly varies with their mass, temperament, diet, the intensity of their general metabolism, the external temperature, etc., yet under conditions which one might call those of maximum effort, the excretion of CO₂ in unit time is very much the same in amount per unit of weight of each of the individuals.

One has only to glance at column 6 of the preceding table to see how closely the figures correspond. The figures are the average amounts in grms. of CO₂ (moist) excreted per kilo: per hour by the various experimenters who had worn all the four types of rescue apparatus. The maximum is 1.5, the minimum 0.87 grms. Out of 11 cases no less than 9 are between 1.5 and 1.1 grms. In corroboration of the figures in column 6, we may take the averages of the amounts of CO₂ excreted by eleven of the observers in each of the instruments in turn thus:

In the Fleuss 1.25, in the Meco 1.28, in the Weg 0.96, in the Drager 1.14 grms. CO₂ (moist) per kilo: of body-weight per hour.

The probable physiological inference from this is, that although the intensity of the oxidation of carbon is affected in both directions by a number of external and internal conditions, yet by hard work and maximal supply of oxygen, an intensity can be attained as a result of which the CO₂ excreted per unit of tissue is within very narrow limits the same for everyone under the same vigorous external conditions.

VII. *The Effects of Heat Generated in the Apparatus.*

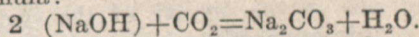
Towards the end of a test the temperature of the regenerators in the Drager, Meco and Weg and of the bag of the Fleuss tended to rise to a degree distinctly uncomfortable to the wearer. This tendency is, of course, particularly well marked when the test has been conducted in a hot atmosphere. The heat complained of is liberated by the union of aqueous vapor and CO₂ with the alkali of the regenerators. Whilst this heat of chemical origin is rapidly lost by radiation in atmospheres not above 70 degrees F., it is lost with increasing slowness as the temperature rises towards 90 degrees F. The heat from the "cartridges" on several occasions became so intense as to burn the skin of the back of the experimenter even through a flannel shirt. Thus on June 21st, 1910, C, wearing a Drager for 76 minutes, had his back badly burned; the temperature of the cartridges was over 200 degrees F. Subsequent observations showed temperatures as high as 201 degrees F. on the outside of the cartridge. After wearing a

Meco at the end of a test of 53 minutes' duration, J. had his back pretty seriously scorched. In both these cases the irritation to the skin lasted a couple of weeks. At the end of the test (120 minutes), on November 15th, 1910, B. had his back burned: he had not been doing work, but merely recording temperatures. On many occasions the discomfort from hot cartridges was considerable, although no permanent reddening of the skin had been produced. Complaints also were constantly being made towards the end of a test of the heat caused by the bag of the Fleuss.

Besides suffering from burns of the skin, the experimenter towards the close of a test frequently complained of the excessive heat of the air returning to his throat from the regenerators.

During the test on June 7th, 1910, D., while wearing a Fleuss, had his throat badly scorched; the temperature of the abdominal aspect of the canvas bag being 135 degrees F. when he came out of the mine after 147 minutes. On this occasion the dry bulb readings were very high, viz.: 103 degree, 106 degrees, 106 degrees F., at 12.10, 12.30 and 1.30 respectively: the atmosphere of the mine was full of smoke and irrespirable.

On November 15th, C. had a disagreeable condition of his throat after wearing a Fleuss apparatus for only one hour; but minor degrees of pharyngeal catarrh were being constantly reported. It seems that the cause of this distressing sensation of heat in the throat is due to the excessively moist condition of the air returning to the experimenter during the later stages of a test. The circulating, constantly re-breathed air must tend to become saturated with moisture in these apparatuses, for not only is aqueous vapor from the lungs being in diminishing amount absorbed by the alkali—and the expired air is always saturated—but the union of CO₂ with the NaOH forms water according to the formula:



A physical factor comes into play after a short time, for the moisture soon "cakes" the adherent sticks of NaOH and thus reduces their absorbing surface with the result that less and less water vapor is retained by the alkali and more and

more tends to circulate in the air for breathing.

The longer the test continues, the less heat can this very moist air abstract from the mouth and throat. The mouth and throat are quite comfortable in the hot room of a Turkish bath, for instance, where the dry air has a temperature of over 200 degrees F., a temperature considerably above that of the body. Now the air returning from the regenerators with a temperature much below 200 degrees F., and, therefore, nearer the body temperature than is that of a Turkish bath, was yet distinctly painful, so that I feel inclined to attribute this to its saturated condition in virtue of which it failed to take up any heat from the mucous membrane of the throat. On the contrary, we have evidence that this moist circulating air was giving up heat in a marked, unpleasant and at times painful manner to the mucous membrane of mouth and throat.

VIII. Oxygen Deficiency; its Bearing on Syncope.

On only one occasion did the committee encounter a sudden loss of consciousness as the result of some untoward condition in any type of rescue apparatus, although we not infrequently experienced symptoms due to deficiency of oxygen from some irregularity in the apparatus. One of these accidents happened in a smoke-filled irrespirable atmosphere, which was also hot and moist (dry and wet bulbs 84 and 80 degrees F., respectively). A Mecco apparatus with Mecco half-mask had not been in the mine many minutes, when the alarm was given that one of the party had been rendered unconscious. In less than a minute we had reached him and removed the mask. His own account was that he had suddenly become dull of hearing and very sleepy, after which he lost consciousness. He had evidently fallen down without any dyspnoea or convulsions, and thus did not alarm any of the members of his team. Owing also to the density of the smoke, none of his companions had noticed anything the matter with him, but when they called to him and got no answer, they at once rang the electric bell and had the ventilation reversed. His pulse on entering had been 76, on coming out it was 112.

His temperature was 98.4 degrees F. before the test began; it was not ascertained on his coming out owing to the accident having happened so recently.

Another accident happened in a respirable but intensely hot and moist atmosphere. At the end of an hour and ten minutes one of the subjects wearing a Mecco became suddenly seriously distressed. On recovering, he still showed signs of mental confusion, for he persisted that the tap of the controlling valve had become displaced, when it was impossible for it to have been twisted at all. Just previously to the accident he had fallen backwards over a steam pipe while dragging a weight along the corridor; he was under the impression that this had displaced the tap. Subsequently a careful examination of the apparatus was made, when it was discovered that a small fragment of metal from a gauze had become detached by the fall and had looped in the injector-nozzle, completely blocking it up. There is no doubt, therefore, that the subject had suffered from a somewhat sudden diminution of his oxygen supply and would have been rendered unconscious had he not been at once released from his apparatus.

We are inclined to regard these accidents as of considerable importance in their bearing on the choice of men for the wearing of rescue apparatus, since it seems possible that one man in twelve, or, say, ten per cent., may, on suffering from oxygen deficiency, faint without giving any such warning as would be given by an attack of dyspnoea. In other words, the possibility of oxygen-deficiency syncope instead of the more common oxygen-deficiency dyspnoea is a serious affair, for the danger of including a person in the rescue who is liable to loss of consciousness is obvious. If separated some little distance from his companions such a person might fall down unconscious and be left behind without having been able to attract notice to his condition, and in consequence, would be a serious handicap to the rescue team. This emphasizes the grave danger of allowing one or two men to enter an irrespirable zone by themselves, and the necessity of every team consisting of such a number that the unaffected men can rapidly carry out anyone who may become unconscious.

IX. Mental Fatigue in Tests of Group III.

One of the most interesting points elicited during the tests in a very hot and moist atmosphere is the rapid onset of fatigue more particularly mental. After a man has been doing hard work for more than 20 or 30 minutes in an atmosphere with a wet bulb at anything over 85 degrees F., he is overcome by a feeling of irresistible lassitude and disinclination to exert himself in any way whatever. He becomes particularly indisposed to mental exertion and irritable when it becomes imperative. Any such mental effort as deciding on a particular course of action, directing operations and assuming responsibility, remembering where a thing is,

pronouncing whether it is of such and such a kind or not, is apt to prove too exhausting. The mental lassitude and irritability in these hot and moist atmospheres is overwhelming in spite of efforts to the contrary.

I think that this partial mental enfeeblement is a fact of some account, inasmuch as a person, fatigued by hard work in a rescue apparatus worn in a hot and moist air, might, in some situation requiring promptness of decision, coolness of judgment of the accurate recollecting, for instance, of instructions, plans, etc., not prove himself equal to the emergency.

SOME EARLY GARDEN TALKS

BY RACHEL E. TODD, M.D., C.M., TORONTO.

In a few short days, we home gardeners will be prying around among our precious leaf and straw covered mounds, to discover what Old Winter has left us of all our cherished hoards. And we will find Old Winter has been very decent to us, if we have been thoughtful for the welfare of our sleeping plants. If we have given our roots and bulbs a careful mulching and a generous protection of leaf and straw and old weathered branches to protect them from our well known winters, they will be so warm, so cosy, and so well provided for, down underneath, with fresh currents of air playing around them constantly, that long weeks before everyday people even dream of it, steady, silent, sturdy growth is taking place.

For after all, our bulbs and roots do not really sleep long, and it is surprising how many people believe that before any growth takes place, the direct warm rays and heat of the sun is necessary, to waken up life. Not so. Our roots sleep with one eye open, as it were; and many of them take but "forty winks," and many of them but pause to take a longer breath or two. But certainly, growth never ceases. In the darkest, dimmest spot and hour, somewhere, in some degree, while there is life, there, growth is going on. For long, long hours, and days, and weeks, it is infinitesimal, but

it is growth, nevertheless. Some of those that go to sleep last and wake up first are such well known favorites as the Iris, Bleeding Heart, Peonies, and the great host of Lilies; and these truly are they that "sleep with one eye open." Their growth is so constant that it can almost be seen with the naked eye.

And so, if one were to go out into the snow covered garden now, and delve down beneath the snow, and lift up the heavy or light—as the case may be—covering of straw and manure, and put one's hand in underneath it all, close to the earth, one will be surprised to find a genuine blanket of soft warm air, moist and life-bearing snuggling over all. And one's fingers (oh, let them be so wary) may touch a tender spike or two, that has pushed up a curious and inquiring blade to see "the time o' day."

Have You Smothered Your Roots?

I spoke a moment ago of "fresh currents of air, playing around the roots." One of the most frequent causes of failure to a young gardener is this very thing. Plants must have air, and plenty of it. And they must have it constantly; and it must be carried to every part of the plant structure in the very same way that blood must reach every minutest portion of the hu-

man body. They breathe it into their bodies constantly.

Now, do you see what that means? Do you see that even while they are sleeping, in the earth and well covered up, they must not be smothered. Sixty per cent. of the deaths in plant life is due to suffocation. I speak whereof I know.

And (bearing in mind what was mentioned a moment ago, the never-ceasing growth) do not conclude that because your Iris, and your Bleeding heart and your Peonies, and all your other roots, have ceased to show a perceptible growth, that they have decided to cease work for the season. Not so. There may be never a green leaf, never a green spike nor the sign of the smallest activity. If the plant is not dead, unseen forces are building up and storing away and gathering strength; and for it all, *they must have air*. Air to play around those tiny tendrils, air to soften the sodden lumps of earth, air to cushion the sturdy main roots, air, air, air to carry to the whole plant being those mysterious unseen, microscopic "Somethings" that we humans can yet neither see nor smell nor touch nor hear.

And so, stop, think. Have you covered them up out there in the busy garden, in such a manner that they cannot breathe?

Go Early into the Garden and "Loosen up."

Now, if you have piled on the mulching, rank, and soggy, and poison, with a too heavy hand, and packed it down tight, with never the thinnest layer of leaves, or straw, or better than all, old withered flower and plant stalks, spread on between, it means sore, sore disappointment, because it means death to your earliest shoots, or, weak, straggly and feeble stalks, that will not be able either to produce bloom, or stand the early Spring rigors; or perhaps it means no showings at all. Your roots may have rotted away, or smothered to death.

So get you out very early and loosen up everywhere—with no sparing hand. Jack Frost will not get in. Wherever well-rotted old manure has been spread without a protective layer of leaves or stalks to provide avenues for the free passage of air, be extra watchful (when the first sprouts appear), and remove the soggy, clogging and cover with clean straw. They will then

have a chance to harden up and may survive.

And, next Fall, you will be careful to provide for the necessary air as I have shown you how all-important it is, by spreading over the beds, first, plenty of dead leaves and flower stalks before putting on the heavier enriching manure. You can heap the latter on with as free a hand as you wish, for no harm will be done.

And the following Spring you will scarcely be able to credit the difference. Your fresh young things will be so hardy, so sturdy and so bold, and so far ahead of their usual time, that you will feast on your success sooner and longer than your neighbor.

What Can be Done in the Garden in February.

A policy of masterly inactivity is not a successful one to practice if you wish a rich reward for your labors. True, there are three or four months, during which one can apparently do nothing, while Jack Frost reigns undisputedly. But we do know what a treasure store lies sleeping beneath the snow. Daily our mind enjoys its secret peeps into nature's storehouse of Love. Long in advance of the first actual appearance of the dainty snow drop we have watched it, in imagination, nod its brave little head. The golden flame of the friendly tulip warms our hearts weeks before its actual coming. What a never-ending joy of planning and plotting, mapping out a change there; arranging a new color scheme there, and attending to the thousand and one tasks always waiting at hand to be done.

We build dream gardens that are truly dream gardens. Every gardener is a dreamer of dreams and no dreamer in the whole wide world enjoys such a close realization of his dreams; for dream he never so madly, and plan he never so wildly, he reaps a reward beyond his richest deserts.

The man who wrote, "My garden spade my every woe can heal," knew whereof he spoke. For he had learned the unutterable peace beyond compare that will come to him who can really place himself in actual touch with Old Mother Earth.

In her broad bosom he burys all his woes. From her throbbing heart he may draw the warmest hopes and most certain joys that

nothing else can ever quite equal. For, look, his meanest effort brings a tenfold harvest of color and shape and smell.

But, let us to work as well as dream. And let me promise you, my friend, a generous share of some of my dream gardens. You shall share with me, in due time, the pleasure of, oh, so many lovely plans. I shall show you how to plant your shrubs so that your garden will change its color from yellow to white, from white to pink, and then to gorgeous red, and once again to virgin white. And all before one even dreams of roses, I shall build a fernery for you, and a rockery and a fairy-like lily-pool. I shall whisper in your ear, oh, practical one, how I made my Iris bed bring me my first sixty dollars. I will show you my two thousand yellow lilies, started last summer, and now sprouting, almost ready to bring me the seven cents a root already contracted for. And all in a city garden forty feet by one hundred and twenty.

We started out a moment ago to see what we might do, besides planning, in the garden in February. Well, let us glance around. Over here by the gate is an unlucky spot. Some prowling dog, with marauding feet has scratched up a poor "pink" root. We will bring it in and throw it in a dark corner of the cellar for a week or so. Here, he has scattered the covering from my "Madonna lillies." Over in the Peony-bed, a couple of bricks have fallen, torn from the chimney by last week's storm. If I take them away now, before they do further harm, they will not hinder the young shoots that will soon be appearing. And by the corner of the verandah, those enormous icicles that have formed on the wistaria branches, will do untold harm if they are not immediately looked after. Their own weight will cause them to break, and with them, snapped off as clean as a knife, will come the very branches that should bear those incomparable racemes of cream-scented Heaven. I can't spare those clusters. Not one of them! So the eaves-spout must be mended *now*. Should a sudden thaw set in, the water from that broken spout will wash out my lily-of-the-valley roots and do more harm in one hour than a whole summer will undo. I certainly cannot spare one single spike of these lovely

bells that shake out of their creamy depths such fairy fragrance.

And so a constant daily watch should be kept, for no day but brings its troubles, no storm but leaves its trail behind. A prowling dog, a careless passerby, a wrathful wind, each one does its work. And *now* is the time to repair the damage. The tulip beneath that tumbled brick is even now building up a thick green spear to push through the earth. That broken tile, fallen into the very centre of your Crimson Rambler has not only broken off some branches, but is rubbing off some fresh young flower buds. Remove the tile *now*, and at the same time prune away the torn stalks, and to prevent the frost entering, melt some wax from an ordinary candle and seal over the bare raw stumps.

And thus, the daily mischief cared for, you will find your real spring work, marvellously lightened. Every little counts, remember.

Have you a "Forsythia Viridissima?"

Now, come with me, to a corner of my wire fence where the wind sweeps free, nor shelter from wall or shrub or tree. A bush grows here, whose luxuriant trailing branches have crept through and over the fence forming a compact and graceful pyramid. In the first week of March you will see this bush truly "a thing of beauty." Can you imagine a feathery golden mass of yellow misty cloud, that shivers and shakes with every breeze, and stands, literally a drift of dainty almost impalpable fairy gold. For week on week from the last days of February until April's weeks are drawing to May, that bush of dear delights will stop every careless passer-by and make him fairly gasp with joy. Then, on a sudden, before your very eye, it will change into a dream of the tenderest green, a ghost-like green that no other bush ever produces. Do you know this shrub? First of all our glorious troop of flowering Canadian shrubs, it is easily the Queen of the Spring. It is the old-fashioned Golden Bell, "Forsythia Viridissima."

For almost two solid months in earliest Spring, through days of sleet and gloom, it flaunts its beauty triumphantly before our starved and thankful eyes.

Now prepare to draw your breath in scandalized amazement, because I am going to prune this bush now, in *mid-February*, and prune, too, with a free hand. And I dare do it, because I know my Queen of Beauty in her every need and mood. Watch me cut out these strong straight stalks with rough, dark bark; these branches were covered with golden bloom last Spring. Notice I do not touch these that show smooth, pale green brown with dark specks sprinkled over the shiny skin. Note how the long slender trailers are loaded with fat brown buds "alternate," and just ready to burst, apparently. A few more days and each bud will become a rather ungainly (certainly straggly) arrangement of four yellow "fingers" forming a flower. But there will be thousands of them veiling the whole shrub from top to bottom. So although I cannot claim that the single flower is in itself beautiful or perfect in form, comparatively speaking, I do emphatically declare that the alluring spectacle of a blooming "Forsythia" en masse, cannot be questioned or equalled. For there is to be found nowhere in our whole catalogue of superb flowering shrubs, one that will afford so

much pure satisfaction, both as regards easiness of culture, and earliness of bloom as well as wealth and profusion of coloring and the unusual length of the flowering season.

But half the secret lies in the pruning of the shrub; and I have found from my own experience that it is best done in early February.

If you have not this shrub, plant one, first of all your Spring planting. You must not be without one. If you have room for only one single shrub, that's the shrub for you. The lovely Forsythia Viridissima.

Next month, I hope to share with you, dear readers, my wealth of Lilacs. You shall see a Persian Lilac whose blooms, long waving plumes, measured last Spring thirty inches. And the tree was covered with hundreds of these plumes. And I shall tell you just how I coaxed my tree to perform such a miracle.

And then we may have time to make acquaintance with some of the most gorgeous Spanish and German Irises that your eyes ever rested upon. This is such a very interesting group of bulbs that I promise ourselves a rare enjoyment.

PROGRESS IN CANADA IN BIOLOGICAL METHODS OF SEWAGE DISPOSAL DURING THE LAST TWENTY YEARS

BY WILLIS CHIPMAN, C.E.

Twenty years ago the principles underlying the biological methods of sewage treatment were attracting the attention of municipal engineers in Great Britain, experiments were being carried on, and prophecies being made, echoes of which were to be heard in Canada.

Broad irrigation was then the accepted standard in Great Britain, although the nitrification theory of purification was not so well understood as to-day. Profitable crops were too often the desideratum rather than sewage purification, but on the whole the results were satisfactory. Broad irrigation had also been adopted at Paris, France; Berlin, Germany, and many other

cities. The land necessary for broad irrigation was not always available, however, and many cities and towns in Great Britain and in Germany had adopted chemical precipitation methods, but generally speaking its advocates were experimenting continually.

The failure to produce a marketable fertilizer from sewage sludge by chemical precipitants stimulated inventors, and many processes were invented, patented, and advertised to the public.

About 1871 filtration through charcoal was tried in England, as a result of which the conversion of the ammonia and the nitrogen or organic matter into nitric acid

was recognized, and the theory of intermittent filtration first brought to the attention of engineers.

The State Board of Health of Massachusetts undertook a series of experiments in sewage filtration in 1886 as a result of which intermittent downward filtration was adopted by many towns, and by 1891 this method of sewage purification may be said to have become the standard in New England.

In the Province of Ontario the first practical attempts at sewage purification were made at the Asylum for the Insane, London. The works were designed by the late Col. George E. Waring of New York, an engineer of international reputation, and constructed by the Provincial Department of Public Works. The sewage was intermittently applied to channels or ditches, well underdrained, but it was then called a flat-bed-irrigation system. The agency of bacteria was, however, recognized in descriptions given of the system.

These works have been in continuous operation since 1888, and the results have been eminently satisfactory, due largely to the labor available for properly operating the beds, and for cultivating the crops.

In 1890 experiments and tests were conducted at the Provincial Institute for the Deaf and Dumb at Belleville with a patented system known as the "Condor" system, but the results were not satisfactory. The chemical solution in this process was merely sulphate of iron.

In the following year the "Ferrozone 'Polarite'" process, another patented system, was experimented with at the Ontario Agricultural College, Guelph. Upon the recommendation of the late C. H. Horetzky, of the Provincial Public Works Department, this system was subsequently adopted at the Mimico Asylum, at the Institute at Belleville, and at other Government institutions throughout the Province.

In 1892, the town of Berlin, Ontario constructed Sewage Purification Works, which were no doubt the first municipal works in Canada.

The population of the town at this time was about 7,500. Three miles of sewers on the separate system conveyed 125,000 gallons daily by gravity to a plot of land secured for disposal works. It was estimated

that over fifty per cent. of the flow represented subsoil infiltration.

Of the twenty acres purchased, five acres at least were unfit for use. Eight acres were originally laid out into four flat beds, closely underdrained, and separated by embankments.

For three or four years the results were quite satisfactory, notwithstanding as much attention appears to have been given to the raising of crops as to the treatment of the sewage. During the winter months the sewage was permitted to flow directly to the small stream with a volume of three cubic feet per second, and only one attendant was engaged in the summer to apply the sewage to the beds in rotation.

In 1896, the Provincial Board of Health investigated certain complaints of riparian owners below, and four years later a small septic tank was added, also two filter beds for experimental purposes.

In 1894, the town of Waterloo followed the example of Berlin and constructed several beds for sewage treatment.

In 1896-97 the city of Hamilton constructed chemical precipitation works at Wentworth street, and in 1898 similar works were constructed at Ferguson avenue, since which they have been in continuous operation. These works were the first municipal precipitation works in the province. The sewage is precipitated by carbonate of lime and sulphate of alumina, the sludge pressed by Johnson presses, and the resultant cake sold or given away to market gardeners, or burned, according to the supply and demand.

Deodorants and disinfectants have been experimented with in several places, but Hamilton has adhered to precipitation, and the satisfactory results are due largely to the original design of the works. The effluents may not be non-putrescible, but the grosser solids are removed.

Of the various proprietary processes experimented with in England, one of the first to receive attention here was the "Amines" process, but it does not appear to have been adopted at any place in Canada. The "Porous Carbon" system was experimented with, but the results were not considered as satisfactory in either case.

The "International System" of purification by the use of "Polarite" and "Ferrozone," having been adopted at several of

the Provincial Institutes, was thus brought pany soon took advantage of this and rosy pictures were painted by promoter artists at Toronto, Stratford and London. In the latter city, in 1898, the system would have been adopted for treating the sewage of the entire city if the engineers acting for the city had not pertinaciously opposed the scheme.

The parent company of the International System was organized in England, and a subsidiary company at Detroit, Michigan, from which point Canada was exploited. Several towns in the United States adopted the system to their sorrow, the most notable instance being Madison, Wisconsin.

After a few years' contributions had been paid to the parent company for supplies of Ferrozone and Polarite, the Provincial Government decided to experiment with sand, gravel, etc., and made the discovery that with selected materials the results were quite equal to those obtained with Polarite and Ferrozone. This process then passed from the Canadian stage of action, to be succeeded by the Septic Tank System, promoted by a syndicate. The claims made for this newly discovered method of sewage treatment were little short of miraculous, and immediately attracted the attention of sanitary authorities in Canada, but it does not appear that any tanks were constructed by municipal authorities in this country prior to 1901.

At Berlin a second investigation was made by the Provincial Board of Health in 1901, the evidence demonstrating that the beds were of insufficient capacity to treat the flow, which had increased to 350,000 gallons of very strong sewage per day. The beds were found to be overworked, waterlogged, full of sludge, and the authorities were at the same time endeavoring to raise crops.

In 1902 the Legislature appropriated \$2,000 to carry on experimental work in the interests of the municipalities in the province, which experiments were made at Berlin. As a result the town decided to construct:—

- (a) Two septic tanks.
- (b) To pump the affluent of the tanks.
- (c) To adopt intermittent downward filtration.

Fourteen acres of high gravelly land subdivided into sixteen beds, were selected ad-

joining the original "Sewage Farm," as the public persisted in calling the works.

In Dr. Amyot's report upon the Berlin experiments of 1902, the system of treating sewage by contact beds was clearly described, as well as the results of experiments with effluents from septic tanks, Stoddard trickling filters, and Intermittent sand filters.

In 1900-1901 the city of Stratford constructed Sewage Disposal Works, comprising intermittent filtration beds, which were soon overworked and outgrown. Additions were made in 1904-1905 and a septic tank constructed.

Ten years ago four municipalities in the Province of Ontario had constructed sewage disposal works:

- (1) Berlin—Filtration beds, 1892. Experimental septic tanks and two small filter beds, 1901.
- (2) Waterloo—Filtration beds, 1894.
- (3) Hamilton—Chemical Precipitation Works, 1896-7.
- (4) Stratford—Filtration beds and small septic tank, 1901.

The sewage from several Provincial Institutions was also being satisfactorily treated.

Two or three experimental septic tanks had been constructed, but the boom of the next decade had not commenced.

As a result of a series of experiments carried out by Mr. D. Cameron, the City Surveyor of Exeter, England, a syndicate was formed and patents secured in Great Britain, the United States, Canada, and other countries throughout the civilized world for the septic tank system. By 1900 the city of Exeter had become a Mecca for engineering pilgrims, and within a few years Cameron tanks or similar tanks were being constructed not only throughout Great Britain but elsewhere, and generally without consulting the Cameron company. This company claimed the following advantages for their system:—

1. The non-production of sludge.
2. An effluent in the best condition for irrigation or filtration.
3. Filters were recommended by the company to purify the tank effluent.
4. A process free from nuisance.
5. Automatic and absolute reliability in working.

6. The first cost was within the reach of all communities.

7. Working expenses were practically nil.

It is not surprising that the Septic Tank System especially attracted attention in Canada, where climatic conditions were more severe than in Great Britain, and the problem of sludge disposal not as well understood.

The first municipal septic tanks to be constructed in Canada were probably the small ones at Berlin and at Stratford.

A larger tank was built at Stratford in 1904, and in the same year two tanks were built by the city of Guelph. The following places constructed septic tanks between 1904 and 1911, approximately in the order given:—

Peterboro, Toronto (Woodbine area); Vancouver, B.C. (in part); Regina, Sask.; Moose Jaw, Sask.; Berlin (No. 2); North Bay, London, Woodstock, Brampton, Barrie, Vernon, B.C.; St. Thomas, Guelph (No. 2); Haileybury, New Liskeard, Orillia, Oshawa, Bridgeburg, and probably other places.

Hundreds of smaller tanks were also constructed for public institutions and private residences, of which there are no records.

In 1910 the Cameron Septic Tank Company, of Chicago, threatened suit against a number of municipalities in Canada for infringement of patents, which had been declared valid by the Superior Courts of the United States, although it would appear that in Great Britain the patentees did not press their claims for royalties.

The most important claim of the company, the non-production of sludge, was soon proven untenable. The discovery was also made that it was not essential that the tanks should be made air tight, and the light excluded, also that the utilization of the evolved gases was more than offset by the risks from explosions.

The Canadian septic tank boom of the last ten years has commenced to subside, but engineers have profited largely by the experience gained.

The removal of part of the matters in suspension renders the sewage more amenable to further treatment and prevents the clogging of beds and filters. The refuse from certain manufactories, such as sugar refineries, breweries, etc., may however neutralize this effect by rendering the sewage

acid.

Many of the tanks constructed during the last five years have been more correctly called sedimentation tanks, sludge removers, rather than sludge digesters.

The "Imhoff" Tank is at the present time prominently in the eye of the public, due largely to the characteristic energy of the promoters of a patented process or article. Dividends must be earned by royalties paid.

The irrigation beds at the London Asylum, at Berlin, Waterloo and Stratford, were practically identical with the downward intermittent filtration system of New England.

The contact bed system evolved from the above system has not had the popularity in Canada enjoyed by the filtration beds or by the septic tank system, owing largely to the expense involved in properly applying the sewage. Contact beds were constructed by the city of London in 1901, by Stratford in 1904, and by Guelph in 1910, also by the city of Toronto at Woodbine avenue, in connection with the Cameron Septic Tank installation.

Hydrolytic tanks do not appear to have been adopted by any municipality in Canada, but experiments were to have been made at Edmonton in 1910, the results of which should soon be made public.

Percolating and sprinkling filters are now being adopted by a number of municipalities throughout Canada, but none are as yet in operation so far as the writer is aware, excepting the percolating filter of the Stoddard type at Vernon, B.C.

At the present date the engineers favor tanks for the removal of the grosser solids by sedimentation, the treatment of the effluent upon filters, and the disinfection of the filtrate after a second sedimentation.

By the end of the decade now dawning, every inland city and town in Canada will probably have adopted some method of sewage purification. Such works must be carried out by the municipal engineer, with the assistance of the chemist and the bacteriologist, and we have much preparatory work to do, not only in educating the general public and their representative councils, but in conducting experiments with systems now in operation and in collecting data in advance of designing and constructing.

NECESSITY FOR PRESERVATION OF FOOD PRODUCTS BY COLD

BY P. H. BRYCE, M.A., M.D.,

CHIEF MEDICAL OFFICER, DEPARTMENT OF THE INTERIOR, OTTAWA.

It will doubtless have been a matter of common interest to all householders, naturally concerned in the cost of living and in the obtaining of food necessities, to observe the influences which affect both, and especially the purchasing of such in their highest hygienic condition at fair prices. For some time past I have endeavored to determine how the preservation of such by cold enters into the problem and am convinced that the need for general public knowledge on the subject, both from the hygienic and commercial standpoints is of the most urgent character. The immense capacity for production in Canada, both of the cereals, animal products, fish products, and fruit products can only be realized, when we examine the returns for any year of the Department of Agriculture, and of the Trade Reports. We have enormous quantities of fish in both oceans and in the inland lakes, meats from all Provinces, with cheese and butter, and fruit, especially from Ontario, the Maritime Provinces and British Columbia. So far as mere local consumption is concerned, we may assume that the foods are supplied in fair condition; but when we enquire how far inland the fish from Nova Scotia or from the Pacific coast reach, we find a quite disproportionate amount to that produced. The same may be said of the extent to which Canadian fruits supply the markets distant from the places of production. To illustrate the first, I learn that a Nova Scotia company has succeeded in sending fish as far as Hamilton, after several years of effort, and that Pacific coast fish comes to some extent to Toronto. As regards fruit, apples may be said to be the only fruit which is transported in large quantities from the orchards, although pears, peaches and grapes are yearly extending their area of consumption.

But in all the latter, common observation teaches us that in the late winter and spring it is the fruits of California and

Florida which supply our needs, while only in the summer and autumn do Canadian fruits prevail.

But if these are facts relating to the home market, it is much more true of the foreign market. In 1909, only some 900,000 barrels of apples were exported from Canada, while probably 15,000,000 are grown, and of those sent to Britain one-third was unfit for market. When enquiry is made as to why so much American fruit enters Canada, and why so little Canadian fruit leaves Canada, it is found that the one real difference is that refrigeration has made possible the sending out annually of some \$30,000,000 of fruits from California, and several millions' worth from Florida. As regards fish products, the American fish companies operating on the Pacific coast have hitherto refrigerated and sent, whether to Canada or the United States, enormous quantities of fish, while the same work by Canadians is only beginning at Vancouver and Prince Rupert, and the fish from the Maritime Provinces is at the most sent iced. Methods for preserving apples by cold storage, so that they may be held over till spring and sent to foreign markets, or even home markets at high prices can hardly be said to exist; while the proper cooling and distributing of the splendid fruits in summer of the Niagara district, is still undeveloped to any great extent.

Now, it will be apparent that when California fruit, as oranges and grapes, can be sent to New York or Montreal, so that less than one per cent. of oranges or grapes is found decayed in ten days, and less than twenty per cent. if held a month, we have results so important, commercially, and from the health standpoint, that we may well enquire how such methods become practical and how they may be put in operation in Canada.

We may, therefore, for a moment enquire as to what is involved in the problem of the conservation of fresh food. In

the living organism we see the operation of vital energy, which, by the absorption of food, maintains a chemical action which develops a temperature in animals of about 100 degrees F., and in plants of varying degrees, but which during the summer and autumn gives fruits a temperature of at least 80 degrees F. It is to this heat that the molecular activities of all matter, whether living or dead, are due, and while it promotes growth during life it will equally, if present after an animal is killed or a fruit is picked, supply conditions for chemical changes or for the growth of parasitic cellular beings in the tissues, as bacteria and fungi, so long as moisture is present and the heat is maintained. Thus warm milk will sour within a few hours, and strawberries will mildew in a single night, in a close summer atmosphere, while similar changes, if less rapid, will begin in meat and the firmer fruits. It is thus apparent that the rapid removal of this heat from the tissues after killing or picking is the only known method, which in practice will prevent the growth of the organisms of putrefaction and fermentation, and the changing of wholesome food into unwholesome.

We are aware, of course, that the transference of heat from one body to another goes on by radiation, by evaporation and by conduction, the first in proportion to the difference of temperature between the two, the second in proportion to the dryness of the air, and the third in proportion to its humidity. In refrigeration it is to the first or radiation that we primarily look; but the relative humidity and movement of the air both enter in as factors. We can best understand this by an illustration. The carcase of a dressed steer averages about 700 lbs. at a temperature of 100 degrees F. when killed. To remove the specific heat of this meat, or, in other words, to reduce it to 32 degrees F., would require the removal of 142 B.T.U. (British thermal units) for each degree for every pound, if the specific heat were that of water. But as it is about 0.8, it means 1.5 less. Assuming the fall of temperature to be 70 degrees F., this means

$$142 \times 70 \times 700 \times 0.8$$

284,000 (B.T.U. in a ton of ice)

or practically the transference of this heat to two tons of ice; or, to take another case, actually worked out, it is found that to cool down a carload of oranges wrapped and packed in boxes in California from 80 degrees F. to 40 degrees F. requires the driving through a duct introduced into the hatch at the top of the car by a fan of all the cold produced by a ten-ton ice machine continuously for 18 hours, the reduction of T being at the rate of 1.8 degrees F. per hour.

And in practice we have in the great abattoirs and in the handling of California fruits these methods constantly in operation, while in the transportation of chilled meats and fruits to the world markets, trains and ships are equipped with cold storage to maintain such products at these low temperatures. It is manifest that this is done with the expenditure of a small amount of machine energy, since it is just as difficult to raise the temperature of food after the heat is removed as it took time and cold to effect the reduction.

But the application of the cold is a matter of much importance. As the temperature falls the moisture increases and it is essential that the R. H. (relative humidity) be maintained at from 70 per cent. to 75 per cent. This can only be done by keeping the air of the cold chamber in circulation, especially during the cooling process. Thus a fan is utilized and a certain amount of fresh air may be introduced to remove especially the animal odors in the case of meat.

It will be apparent that different degrees of cold are demanded for different products, as where meat is frozen in Australia to be taken to London and where ice cream is made at as low as 10 degrees to 20 degrees F.

But not only is the machine for producing cold necessary, but when cold storage warehouses and cars and holds of ships exist, their construction to prevent heat transference to the surrounding air is of equal importance. This is done especially by constructing hollow walls with non-conducting materials. Similarly in hot weather and with moving trains provision for recooling is demanded, and in bringing cars from California several cooling stations exist where the cold air is blown into a car in transit to New York, etc. The

science of ice-making for commercial purposes dates back for more than 50 years; but it was not till 1887 that the first cargo of frozen meat was successfully brought from Australia, while the chilled meat trade of the United States dates back some 25 years. Its application to California fruits is of a still shorter period.

It is not possible to enter here into the discussion of various machines but in the various forms of ammonia machines we find the problem successfully solved, its application and certainty of its success from the commercial standpoint depending upon the degree of knowledge applied, both in construction and in the daily operation of the machine. Manufacturers are constantly improving mechanical effectiveness, till it is stated that the cost of operating a one-tone ice machine is as low as 1 penny per hour for power.

It will be apparent from what has been stated that the successful application of refrigeration, commercially, depends primarily upon the production of healthy animals properly killed and of mature fruits properly picked and packed.

The farmer and fruit growers must be the first to recognize this, and it is found that by organization and co-operation amongst them will the highest results become possible. Much has been done in Canada towards educating these in growing good breeds of cattle and fine varieties of fruits; but less has been done to standardize methods in picking and pack-

ing fruits with preliminary pre-cooling. In California, especially, many associations of fruit growers exist, where trained operators regulate the process from the field to the refrigerator car.

It has long since been perfected in the great abattoirs of Chicago, etc., and to a less degree in the fish trade. In cheese, milk and butter, with the long operation of factories, it is regrettable that methods promising so well 25 years ago have not greatly advanced. But in nothing would it appear that Canada needs such methods so greatly as with fruits. Canadian apples are probably the finest in the world, and bring in April £2 and more per barrel for the best qualities. Yet ordinary picked fruit is being slaughtered in October when fruit decays fast, whereas for at least six months millions of barrels if pre-cooled and kept in cold storage could be supplied to the world's market. If California can get \$30,000,000 for the fruits of a few counties, surely Canada ought to be able to save at least 5,000,000 barrels in a season, which, at \$5, would yield \$25,000,000 and supply the best of all anti-scorbutic fruits to the people—a food absolutely demanded in the best of all anti-scorbutic fruits to the climates. Surely our capitalists can well afford to organize with the fruit growers to produce and conserve products of inestimable value to the people, both from the health and the commercial standpoints.

SOME RECENT ADVANCES IN MEDICAL INSPECTION

BY MRS. N. C. SMILLIE, MONTREAL.

In this Coronation year, when the desire of so many is for closer Imperial relations, it seems peculiarly fitting that this Canadian Public Health Association should have been so graciously opened by His Royal Highness, the Duke of Connaught, who comes amongst us, doubly welcome, as brother to our late dearly beloved King Edward VII., and as Governor-General, representative to us of our reigning sovereign King George V.

The Women's Imperial Health Association of Great Britain has a very apt motto, "The power of the King is in the health of his people," so to-day, in considering the many different social hygienic problems, we are showing our loyalty in one of the best constructive ways possible.

Before proceeding to the subject matter of my paper, I wish to express my thanks for the honor conferred upon the social women workers, in asking some of

us to address a convention composed almost altogether of professional medical experts, men whose altruistic endeavors are well known, but who, in the busy rush of their daily life, having erected many sign posts to guide those interested in hygienic reform, now welcome as their assistants, those women, who, having leisure and interest, are glad to help in removing the many barriers that impede the path of hygienic progress, or, perhaps, make it easier, to build those bridges of influence necessary to convey from the public treasury, the funds needed to carry out the general wishes of an enlightened citizenship.

Our subject for to-day is a very practical one, "some recent advances in medical inspection," and if time permits, we will glance at those forms of said inspection which touch most closely the life of the home and the mother;—inspection of food supply as a basic necessity—inspection of school children, with its important relative factor, the visit of the school nurse—and, most modern of all, inspection of employees in departmental stores.

All these forms of inspection are new to Canada, none of them was in common use even a decade ago, the only thought in the public mind about medical inspection being that it had something to do with a quarantine station at Grosse Isle for arriving immigrants, or a compulsory vaccination of some traveller by train, or possibly an embargo on cattle; but the wonderful things accomplished in the space of five short years reads almost like a fairy tale.

As the first step towards continuance of life is taken, when the new born infant receives nourishment, we will start with inspection of food. The question of a pure milk supply will be fully and ably dealt with in another paper read before this Congress, so it will not be necessary for me to tell of the good work being accomplished in this locality by the nine milk inspectors, who visit dairies within an area of one hundred miles of Montreal, so we will proceed at once to the inspection of the more solid food. The local food by-law is up-to-date, but there are not enough inspectors to fully enforce all its provisions—in reference to the covering of articles for sale, such as meat, fish, fruit,

vegetables, etc. The agitation re the covering of bread, is still being proceeded with by a committee of the Montreal Women's Club. The following facts and figures show the subject of confiscations to be one of the most important departments of food inspection.

Confiscations of food made by the Inspectors of the Food Inspection Department, from the 1st of January to 31st of October, 1911.

Confiscations at Abattoirs.

Cattle	265
Calves	2,730
Sheep	153
Hogs	298
Bruised meat (lbs.)	165,596

Confiscations at Markets, Stalls, Wholesale Commission Stores, etc.

Beef (lbs.)	14,792
Veal (lbs.)	31,466
Mutton (lbs.)	5,029
Pork (lbs.)	6,172
Sausages (lbs.)	5,823
Poultry (lbs.)	2,824
Blood Pudding (lbs.)	1,446
Kidneys (lbs.)	2,342
Tripe (lbs.)	194
Livers (lbs.)	4,618

Confiscations at Fish Markets, Fruit and Vegetable Stores, Grocery Stores and Restaurants, Bakeries and Confectioneries.

Fruits (lbs.)	69,323
Vegetables (lbs.)	40,105
Fish (lbs.)	13,968
Eggs (gals.)	1,200
Ice (lbs.)	25,000
Loaves of bread	275
Merchandise, sundries (lbs.)	18,874

Inspections of Food made by the Inspectors of the Food Inspection Department, from the 1st of January to the 31st of October, 1911.

Number of inspections at the markets	2,328
Number of inspections at butchers' stalls, private stalls, including fish markets	34,986
Number of inspections at packing houses and wholesale commission stores	242

Number of inspections at railway depots	226
Number of inspections of bakeries and confectioneries	1,858
Number of inspections at groceries and restaurants	4,679
Number of bread waggons inspected	1,483
Number of fruit and vegetable stores inspected	758
Number of cold storages inspected.	167
Number of inspections of ice on the river	60
Number of inspections at abattoirs	292
Number of special inspections	219

In the matter of medical inspection of school children, France led the way, three-quarters of a century ago, many other European countries following suit, in the latter part of the nineteenth century, but on this continent, a decade ago, inspection of school children was considered as an infringement of private and family rights. To-day, both in the neighboring republic and almost throughout the whole of our Dominion, the leading cities welcome medical inspection of schools as a vital necessity in the prevention of contagious diseases, and an essential factor in the up-building of a physically efficient people. Again, the close relationship between health and happiness, as expressed by Thomson in his "Seasons"—"Health is the vital principle of bliss"—has made the question of inspection of school children a central point, from which to work to gain many other desired reforms, in those civilized countries which seek to secure for their children a good fighting chance, in any career.

In Canada, medical inspection of schools first came into operation in the City of Montreal in September, 1906, after a four years' campaign, conducted under the auspices of the Hygiene Committee of the Montreal Women's Club. This movement was copied soon after by the extreme West, in Vancouver, and the extreme East, in Halifax, and was gradually adopted by the capital city of each Province, with the exception of Prince Edward Island, and New Brunswick.

In Montreal, the inspection has always been daily, and under the jurisdiction of the Board of Health. In the first place,

this was necessary, for Montreal is blessed with several school boards, and the matter was much simplified by having the medical inspectors report directly to the contagious diseases department of the Board of Health. Indeed, even where the educational system is more unified than in Montreal, it is desirable to have medical inspection under civic authority, then neither a school commissioner, a principal, nor a teacher has the responsibility of deciding a question which, after all, should rest on the knowledge of a medical expert. Many other cities in Canada have not conducted their inspection in this way, but Montreal followed in the lead of the best established systems, both on this continent and in Europe. The co-operation of the principals and teachers has been an essential factor in this movement, and the benefits they themselves received in dealing with cleaner, happier children have often been made a subject of congratulation to those who first undertook this campaign. Following the establishment of medical school inspection came another reform which is proving to be one of the greatest helps in hygienic progress, that is, the introduction of women into this field as school nurses—(unfortunately there are so few women doctors in Canada that but few are available to be employed as medical inspectors. Toronto, Vancouver, and Montreal have been glad to secure the services of professional women and wherever possible the senior girls can be more efficiently dealt with if under the care of a woman physician, while the teaching of social and sexual hygiene, introduced into the curriculum of so many countries is bound to be adopted sooner or later in Canada, and women physicians will be needed for this work among the girls)—to return to the subject of the school nurse—in following the poorer children to their homes to ensure a more speedy return to school, she is given an opportunity of observing the conditions of the home-life of the pupil and is frequently an instructor of the mother in lessons of hygiene which benefit all the members of the family. Her services are yearly becoming more valuable, particularly as in our larger Canadian cities there is such an influx of foreign peoples, whose knowledge of sanitary

science is of the crudest, and whom we still further hamper by forcing them to herd together in houses that are a scandal to our prosperous civilization.

Here follows a rapid survey of the medical inspection of schools as conducted in the leading cities of Canada:

Table of Medical Inspection of Schools.

Province	City	No. Children	No. Inspectors	Salary	No. Nurses	Salary	Inspection	Board
Quebec	Montreal*	74,524	19	\$1,075.00	5	\$ 720.00	Daily	Health
Ontario	Toronto	50,100 (about)	9	{ 1@ 2,500.00 8@ 800.00	17	{ 1@ 1,800.00 6@ 600.00	Daily	Health
Manitoba	Winnipeg	16,000	2	1,000.00	3	850.00	Daily	Education
Saskatchewan	Regina	2,500	1		1	1,200.00	Weekly	Education
Alberta	Edmonton	3,000	1	1,200.00			Biennial	Education
B. Columbia	Vancouver	11,050	1	2,700.00	2	{ 1@ 1,080.00 1@ 900.00	Daily	Education
Nova Scotia	Halifax	9,000	2	250.00			{ at inter- vals	Education
N. Brunswick	St. John	(No Report)						
P. E. I.	Charlottetown	(No inspection as yet on the island)						

*The province of Quebec has no compulsory education law, therefore, in Montreal, we have the anomalous situation of enforcing a compulsory vaccination law without compulsory attendance at school. The freedom of this city from smallpox, surrounded as we are at the present time, both in the province, and the adjoining state of Vermont, with several epidemics of the disease is no doubt due to our excellent system of medical inspection of schools and compulsory vaccination of employees in industrial establishments.

Montreal makes use of its medical inspectors of schools all the year round, industrial establishments being visited during the summer months, their sanitary condition enquired into, employees vaccinated, etc. One of the nurses employed by the Protestant Board is made use of by the Board of Health during the summer months, in the statistical department and for occasional visits to the homes of newly born infants. The nurses provided by the city for the Protestant Board are all well qualified district nurses of the Victorian Order, Montreal has a sufficient number of medical inspectors, but the number of nurses is altogether too few for the magnitude of the work. Our city, fortunately, has the benefit of the fine district work of the fifty-five nurses of the Victorian Order, three being employed in the pure milk depots established by the Local Council of Women, and all helping to improve the hygienic condition of thousands of homes; the adjacent City of Lachine also has established medical inspection of schools with weekly visits, and the hospital dispensary facilities both there and in Montreal have been made use of freely for the treatment of the poorer children. Montreal also has had a new hospital established to give free medical services to

the children of poor families who are attending school, and last year this hospital alone attended to over fifteen thousand consultations.

The list of questions to be answered by the children to the medical inspectors in Edmonton include one as to the place of

birth of the child and another as to the nationality of both father and mother. In this way they tabulate the prevalence of disease amongst the foreign people in contrast to that among the native born.

The Province of Saskatchewan has adopted a wise and important policy in employing a highly trained nurse who visits all villages of one hundred inhabitants and over, and, taking the prevention of tuberculosis as a central theme, addresses the people upon hygienic subjects, always using the schoolhouse as a place of meeting.

This brings us to a plan recently adopted by the Provincial Government of Quebec, which has, at the suggestion of the Provincial Board of Health, divided the Province into ten sanitary districts, each district to be in charge of a trained sanitarian, to be known as assistant inspector, who will represent the Provincial Board of Health, and will give his whole time to the Province. These appointments will not come into effect until July, 1912, so as to give the physicians who will fill the positions time to qualify by following the special course of applied hygiene which is now being given by the three universities in the Province of Quebec, from October to June, courses which will give the diploma of public health, or professional sanitarian.

The annual salary will be \$1,200.00, gradually rising to \$1,500.00, to those who give satisfaction to the Provincial Board of Health, which Board will pay the traveling expenses of inspectors while on duty. The plans of the Provincial Board of Health include something still further, as its secretary, Dr. Elzear Pelletier, has brought forward a scheme for the medical inspection of rural schools, which, if adopted, will bring this Province into line with England, Sweden, and other leading countries in the matter of inspection of all its school children. The following percentages of the physically defective children will bring home to us how necessary it is in this twentieth century to do more practical preventive work in the schools, if our future citizens are to be physically efficient for the battle of life, but if the Province of Quebec recognizes this need, why not the Dominion?—

Suffering from serious defects of vision	10%
Suffering from defective hearing	4%
Having suppurating ears	2%
Having adenoid tumors or hypertrophied tonsils obstructing the nose or throat	8%
Having advanced dental caries	30%
Having ringworm	1%
Having tuberculosis in an easily recognized form	1%
Having heart disease	1¼%
Suffering from malnutrition	10%

If the enforcement of the Juvenile Delinquent Bill passed by the Dominion Government, is urged upon the Provinces as a measure to correct moral ill-health of children under sixteen, why not a Dominion Bureau of Health, urging medical inspection of schools as a prevention of physical inefficiency? Many cases of so-called moral ill-health would then be prevented, as frequently the moral delinquency can be traced to a physical cause.

In reference to medical inspection of the employees of departmental stores, one of our leading firms has inaugurated a system which will do much to regulate the health and improve the morals of their thousands of hands, and in so doing, en-

sure to the public a greater measure of safety, in receiving goods handed out to them by people who are, of necessity, for the most part forced to live in the most unhygienic portions of our city. This firm employs one of our leading young medical men, who gives his mornings to this inspection, every employee has had to undergo a strict medical examination, the average number of cases needing immediate treatment being about forty a day. This firm employs about two thousand hands. Of course, the number needing attention will diminish, the inspection being but a few months old. An up-to-date hospital of four beds is in the establishment for emergency cases of either employees or customers. Two nurses follow the cases among employees to their homes, and patients requiring operation are sent, by the firm, to one of our general hospitals. Even the question of deportment, such as dress, the wearing of jewellery, unhealthy modes of dressing the hair, are all receiving attention at the hands of the head nurse, a woman of well known ability in influencing others. The manager contends that this is not philanthropy, but a sound business policy, as if even a messenger boy is absent through ill-health, the administration is disorganized to a certain extent. This work has been found to be of great value in certain firms of the United States, and this Montreal firm hopes that their adoption of it will be an example to be followed by many other firms in Canada.

In conclusion, the inspection of food, the inspection of school children, the inspection of departmental stores, all appeal strongly to the home-maker. We women are the shoppers for the nation, the mothers, and for the most part the teachers of the young children, and we are the administrators of the food department or internal economy of the home, we are, therefore, glad that in all these matters, medical inspection is doing its part to make our work more telling in the uplift of the race, and gladly do many of us devote our leisure time to the study of these problems, and try to assist those whose more scientific knowledge points out the way to still further reforms.

HYGIENE LABORATORIES IN MILITARY CAMPS

BY MAJOR H. W. JACQUES, P.A.M.C.,

HYGIENE LABORATORIES, MCGILL UNIVERSITY.

Laboratories in connection with military service at once divide themselves into two separate and distinct classes:

1st. Laboratories in camps of a permanent or semi-permanent character, and,

2nd. Laboratories in the field in time of war.

A laboratory belonging to the permanent or semi-permanent camp may be equipped to any degree of efficiency required; the only item to be considered is one of expense. If so desired, it can be made the equal of the city laboratory. Such a laboratory would probably be considered too expensive to do duty for a portion of the year only. Once the nature of the work required is known the proper equipment can be easily supplied. At Petawawa last summer a building quite sufficient for its purpose was erected and ready to house the equipment in three days. This included water, sewer, and gas connection. The possibility of having the three last conveniences, of course, overcame many difficulties and made the work much easier. In the absence of gas one would have to depend upon some form of oil or spirit lamp. This, of course, would be quite a handicap, but is a workable proposition. With the equipment provided it was possible to do a complete analysis, both chemical and bacteriological of water and milk, examination of urine, suspected throat cases, sputa, and discharges from wounds. It also permits of a much more thorough examination of the ration which at present is one of inspection only. In certain cases of illness especially those involving pay, the laboratory is a great aid to the medical officer in establishing a quick and positive diagnosis.

The principle work lies, of course, along the line of preventive measures, the chief of which is guarding against the use of contaminated water, milk and food supplies. The area covered by troops in the course of a summer encampment is quite extensive, and as the water in great part must be supplied from natural sources, it

becomes a matter of the greatest importance that the officer commanding should know which waters are safe and which unsafe. This can, of course, only be determined by a thorough examination of the water and its surroundings. With a laboratory located in the camp, any supplies which are likely to be used, can be examined and reported on before the troops actually reach the ground. If reported unsafe the officer in command may change the location of his manouvring ground, or if conditions call for the original plans to be carried out, he may take the necessary precautions to protect his men, by having the water boiled, filtered or treated chemically. In this way epidemics caused by water borne diseases may be avoided, and I am sure that as this line of work becomes more developed, the old camp enemies, Enteric and Dysentery, will diminish proportionally.

Much that has been stated is equally applicable to milk supplies. Coming as they do from local points, and gathered under all kinds of sanitary conditions, a careful and frequent examination of the chemical and bacterial content is of the greatest importance.

Hospital work is greatly facilitated by the presence near at hand of a working laboratory. This applies particularly to chemical laboratory work. With the improved apparatus at hand, examinations of urine can be more thoroughly made, cases of insipient phthisis accurately diagnosed, permitting of the proper treatment of the patient and his surroundings.

We now come to our second division—Laboratories in "time of war."

Here we find the conditions changed in almost every respect. It would be impossible to convey even the most essential articles of laboratory equipment from point to point, on account of breakage, even were the necessary transport provided.

Here the work both chemical and bacteriological would of necessity have to be done with an equipment small in bulk so

as to economize transport space, capable of withstanding any amount of hard usage, and so arranged to permit carriage by either pack or wheel transport. The greater part of the work would have to be done in a tent or some such temporary shelter, conditions quite different from the comfortable and well-housed camp laboratory.

Water and food supplies are again of paramount importance. For chemical work one would be driven to use the tablet analysis case, and the best you can expect from it is to recognize gross pollutions, smaller ones escaping your notice altogether.

Bacteriological work suffers from the same handicaps. Cases containing slides and stains must be depended on, so that your efforts would be confined to slide work, the sedimentary examination of water and milk, including germs, and smears of all varieties.

Under these conditions the knowledge obtained from thorough and careful examination of the surroundings, must take in great part the place of that generally provided by the laboratory. For more elaborate and careful work, the materials must be sent back to the laboratories at the base or on the lines of communication.

THE CONTROL OF A SCARLET FEVER EPIDEMIC AND ITS DIFFICULTIES

BY T. A. WHITELOW, B.A., M.B.,

MEDICAL HEALTH OFFICER OF EDMONTON, ALBERTA.

It is probable that there are few Health Officers in charge of our larger communities who have not had at some time the responsibility of combatting a scarlet fever outbreak.

During the last year the City of Edmonton has had an unusually large number of cases of scarlet fever which was specially prevalent from April to July, when more than 50 per cent. of our cases of infectious disease was due to this type. The rise and subsidence of the epidemic is indicated by the following table:

Month.	No. of Cases.		Total.
	City. Cases.	Outside Cases.	
February	3	5	8
March	17	3	20
April	27	13	40
May	53	5	58
June	69	3	72
July	43	1	44
August	12	7	19
September	7	3	10
October	8	1	9
	239	41	280

Up to May the remarkable feature of the outbreak was the comparative immunity of the school children of whom very few were attacked. Of 21 cases of scarlet fever admitted to the Isolation Hospital during April, 12 were adults past the school age and 6 were under school age or had just arrived in the city, which indicated that at the outset the disease was not at all prevalent among school children or due to contact at the school. During May the proportion of cases among school children increased, there being 22 out of the total of 58. Of the remaining 36, 17 were over 15 years of age, and 19 under school age. During June, when the maximum was reached, the proportion of school children attacked became much greater, while the percentage of adults became normal. During July some decline in the number of cases became noticeable, which became more marked during August; normal conditions being reached in September.

The course followed by the Health Department was to encourage as far as possible the prompt removal of all cases to the Isolation Hospital and disinfection of the premises affected, but prejudice in some

cases, obstinacy and ignorance in others made it impossible to remove a number of cases where home conditions were not at all favorable for the isolation and treatment of the patient and the protection of susceptible members of the family. The number of secondary cases was, therefore, much greater where quarantine regulations were put in force in private houses, than where removal to the hospital of the initial case was effected.

Though the subsidence of the outbreak coincided with the advent of the holidays, it was not thought necessary to close the schools as the percentage of school children attacked did not become very marked until almost the end of the school term. Moreover, it was thought that greater exposure to infection might occur through contact at play if the schools were closed, and stricter supervision could be carried out by the teachers and the Medical Inspector while in attendance at school. On account of the very close contact afforded by attendance at Sabbath schools and the entire absence of any medical supervision there, it was thought advisable to close up the Sabbath schools in June and the proprietors of moving picture shows were requested to exclude all children under 16, which the majority of them cheerfully acceded to for two months. Considerable opposition to the closure of the Sabbath schools on the part of some of the ultra-religious developed and some criticism was tendered the Health Department and especially the M.H.O., whose religious convictions were by some regarded as hopeless, but so far as could be learned, no falling off in Sabbath school attendance or a lowering of the moral tone of the community had occurred when the restriction was removed in August.

The difficulties met with in controlling this epidemic appeared to be the following:

1. The existence of mild unrecognized cases under no restrictions whatever during the whole course: In some of these, seen late in the attack, a diagnosis could only be made in consequence of the development of secondary cases and the history of slight indisposition some time previously. These cases, I believe to be the most dangerous from a public health

standpoint, as no physician is called nor a report made to the Health Department.

2. The existence of a more or less mild but recognizable type, where conscientious and careful parents will call in their physician, especially when the disease is known to be prevalent, but where a desire to avoid inconvenience of quarantine or the expense of medical treatment, causes many parents and guardians to conceal the disease until all acute symptoms have subsided, when the patient is allowed to mingle with the public in such condition as to readily infect other susceptible individuals by contact: It seems difficult or impossible to deal with such culpable and selfish carelessness. To attempt to secure a conviction in such cases is useless, as magistrates usually accept the plea of ignorance invariably advanced by the accused, as sufficient reason for dismissing the case.

3. The failure of some physicians to recognize or a tendency to minimize symptoms, which ought to be at once reported to the Health Department and the case subjected to surveillance: This was not apparently a great factor in spreading the disease as the majority of physicians gave every possible assistance to the Department in reporting suspect cases.

4. The tendency on the part of physicians to take advantage of the too short minimum period of detention allowed by our Health Act, to ask for release at the end of three weeks: The new Health Regulations of the Province which have since come into effect, have increased the minimum period of quarantine to four weeks, but even this period I am satisfied appears to be sometimes too short, even where desquamation is apparently complete and recovery perfect. Fortunately very few secondary cases occurred after release from the Isolation Hospital, even when the Health Regulations made three weeks the minimum. When desquamation was complete and no discharges from throat, nose or ears, were apparent, physicians had the legal right to ask for release, which was usually granted after thorough disinfection of the clothing and patient. However, in two cases released even after six weeks' detention, where recovery seemed perfect in every respect, secondary

cases occurred. In the first, kissing was freely indulged in by the fond young mother who in three days had the disease and in the second, patient on reaching home was allowed to sleep the first night with another child of the family, possibly because sleeping accommodation was limited, as is the case in many of the homes of the laboring classes. In these cases there was absolutely no doubt, as to the thoroughness of disinfection before leaving the hospital. The question then occurs, is the scarlet fever germ still present in the throat, nose and mucous membranes after even six weeks of quarantine? We know that the diphtheretic bacillus is frequently found in the throats of patients many weeks after recovery. Why may this not be the case in scarlet fever? This suggests to me very forcibly that it is impossible to guarantee as an absolute certainty, that infection will not be conveyed after any given period of time up to eight or nine weeks, and yet it would be an injustice to greatly lengthen the period of detention for the vast majority, who do not and will not convey the infection after three to six weeks' quarantine, when fully recovered, as far as can be judged, and properly and thoroughly disinfected.

5. Prejudice existing in the minds of the public regarding Isolation Hospitals leading to difficulty in obtaining proper and effective quarantine: Many of our homes, especially among the working classes are small, consisting of from one to four rooms, and it is little wonder that secondary cases frequently occur in spite of all instruction given. There is reason to suspect also that quarantine regulations, as applied to private residences, are occasionally broken by householders who cannot and will not see the necessity for such precautions. The remedy for this is to equip and maintain an efficient Isolation

Hospital properly conducted, which in course of time will gain the confidence of the public so that the great majority of the cases can be induced to go there. A law of forced hospitalization would be in the interests of public health, but would be extremely difficult to enforce in our community at present.

The evidence gained from a close observation of this series of 280 cases, coming under my notice, indicates very strongly that the chief source of infection was the secretions, and that actual contact with other cases of the disease took place in the great majority of the cases. No material evidence is to hand which indicates with any degree of certainty that the desquamation played a very important part in the spreading of infection or that infection was transferred by a third party or any inanimate object. Disinfection by the formaline and permanganate method, and bi-chloride of mercury in solution, was liberally and freely carried out as far as was possible, but I am not inclined to give these measures as large a share of credit for the early cessation of the outbreak as is usually attributed to them by the public. Every effort was made to follow up promptly each suspect case, reported either by private individuals or by physicians and the absence from school of any member of a family reported by the school teachers, was made the occasion for an investigation. More than half of all the cases were removed to and treated in the Isolation Hospital, which included the majority of those whose homes were small and the exposure of others imminent. The advantage to the householder of allowing a child to go to the hospital is gradually becoming better understood and every care is taken there to prevent cross infections in which respect we have so far been comparatively successful.

TOWN PLANNING AND CIVIC AUTHORITIES

BY DR. J. E. LABERGE,

SUPERINTENDENT, DEPARTMENT OF INFECTIOUS DISEASES, MONTREAL.

Hygiene, the aim of which is to check the dangers inherent to a grouping of individuals, must therefore take a great interest in the housing of families, and especially

in dwellings in large centres.

The subject of hygiene in city dwellings is one of the most serious that should preoccupy all those who have to deal with pub-

lic health and, especially, the municipal authorities. However, we must confess that, until of late years, this important matter received little consideration from the public authorities; this is due greatly to the ignorance of the public in matters of hygiene. Even among our own colleagues of the medical profession the knowledge of hygiene is very rudimentary; many physicians rest satisfied with treating patients; their studies, their works do not extend beyond the realm of pathology; very few, unfortunately, take a serious interest in matters of hygiene. However, the hygienist is the guide and the sanitary adviser of the families. The wholesomeness and salubrity of the habitation is one of the principal objects of the hygienists; and it must also be to our colleagues of the medical profession, as well as to the municipal authorities, the object of constant preoccupation. These two great factors, "sanitation" and "salubrity," naturally lead us to seek for pure air and sunlight which are the two important agents to keep our body in a good physical condition, or to restore impaired health.

It is not because the public is refractory or indifferent to sanitary legislation that we see so many unhealthy dwellings in large cities; it is ignorance of the principles of public affairs; and as a sanitary law can only have a practical effect when it is in accordance with the public mind, it follows that education and legislation should be the two great factors to improve the actual state of affairs in so many cities of this country. The problem of a sanitary habitation for all classes of the population, is, it is true, of a rather complex solution; therefore, we must have recourse to all scientific and philanthropic associations, to the working classes as well as to the liberal professions, or to the great financiers; in a word, it is necessary to rely upon every person of good will, in order to secure for the population pure air and sunlight in abundance. How many families live in narrow and dark wretched lodgings, where the sun's rays never penetrate? What restoring sleep will the tired workman find coming back home after his day's labor, breathing a mephytic air, introducing into his organism those germs called microbes, which will find in a weakened body the soil

favorable to their development? Very often this poor workman will leave his sad dwelling to go to a tavern where alcohol will hasten the fatal solution.

This subject of the habitation lies in the path of all social reform works; that is to say, each and every one should co-operate with the impulse in favour of a salubrious habitation. Persons of duty and devotedness, who will have espoused this noble cause, will not be sufficiently armed for the struggle if the governments, either municipal or provincial, do not come to the rescue. It is not simply a legislative intervention, that is necessary in this case; it must also be an economic intervention, this is certainly socialism, but good socialism. In such a matter, it is not enough to legislate, it is also necessary to educate the people to a certain extent; because to transform the state of a dwelling, the habits and morals of the people must be changed, and in order to obtain this end, the people must be made to know better conditions than the actual ones before their eyes; the people must be inculcated with the taste of comfort and dignity, taught cleanliness, made to understand the need of sunlight and pure air to preserve one's health. Instead of leaving to the initiative of individuals, of speculators, the care of laying out streets, more or less wide, rather the latter than the former, the authorities, whoever they be, should take in hand this transformation and, in buying to sell later on all vacant lots in a given radius, should, after having made the wanted and needed improvements, sell these lots under certain restrictive conditions which would prevent the detriment of the aesthetics by certain persons erecting structures which would depreciate the surrounding buildings.

When a public administration determines the undertaking of a sanitary measure of this kind, the problem to decide upon requires intervention on the part of the hygienist, because this is a matter of public sanitation; on the part of the financier, because this work calls for expenses exceeding the ordinary receipts; also on the part of an engineer who will sketch out new streets to give the maximum space, as far as means of communications are concerned. But, all hygienists, financiers and engineers are not equally qualified to fulfil this

task; they must be learned, of great conceptions, they must be men who foresee the future; they must be persons of duty, whose activity increases according to the difficulties to be encountered, men for whom difficulties only exist to be overcome; in fine, men for whom difficulties have the allurements of a stimulant, and not of a sedative. The public do not always choose such qualified men to commit to them the administration of their affairs; they sometimes consider as a business man worthy of such a task a gentleman who has been able to make a certain trade successful. This gentleman may be a clever tradesman, but he is not necessarily a business man in the strictest acceptation of the word. As financier, here, must be understood the man who conceives the needs, not only of the present, but who foresees for twenty, thirty years hence; the man who can say: "In ten, in twenty years we will have a population of so many, and an income of so much, and we will have such and such sources of income to pay for these improvements, either required by hygiene or by the increase in the population." The real business man will be the one who will find the necessary money to make successful all great public enterprises which are needed. The engineer, the learned economist will foreknow the need for a great boulevard, for a park, for a sewer system of such or such dimensions to meet the requirements of the future; a man who will secure for his city a water supply free from all causes of contamination in the future.

It is not an opportunist that is needed to administer a large city; the right man in the right place will be the one continually in quest of progress and will be able to secure it.

In our American cities, the ways of rendering a town wholesome differ from those being employed in European cities which are surrounded by thick walls and deep ditches, conditions which complicate the problem. All around our cities, without any line of demarcation, there are fields, large open space, which a municipality could acquire to divide into building lots, according to a well studied uniform design, which would be transformed into attractive suburbs; these new wards, hav-

ing all desirable modern arrangements, such as large parks, wide avenues, securing an abundant aeration, proper light for the houses, abundant supply of water free from all contamination, underground wires, etc. This perfect hygienic arrangement of the new wards is only possible when the municipal authorities take it in hand; left to private initiative, the new wards will be just as bad, if not worse than the old ones.

Nowadays, the facility and cheapness of communications by trolley cars almost cancel distances. Workmen are transported from one end of a city to the other for five cents, and the distance to the workshops is no longer an obstacle to the convergence towards the periphery of great agglomerations. Under such conditions, a progressive administration can, with expenses relatively low, undertake great ameliorations, the results of which would be to render those unhealthy centres wholesome and to facilitate circulation in the old wards of a city. The great increase in the population of certain centres requires new ways of communications, the opening of long and wide boulevards, and the rendering healthy of the old wards by making parks which will be wells of air and light in those overcrowded centres, where the houses are unhealthy habitations into which light and pure air seldom penetrate. Those ameliorations will necessarily make all these lodgings disappear, where nothing but ruin and misery are to be seen, where ignorance, routine, the evil glare of cities, inveterate habits, too often unhealthy and costly, confine the population in those centres where physical degeneration awaits them. As a consequence of these great transformations, the people who lived in those centres will be taken to these outside spots, where light, air and space are not spared; this is what I call making headway.

These displacements cannot be effected without exciting much criticism and arousing protestations prompted by the narrow-minded people. But the general interest must always prevail for the one whose mission is to govern, to administer a large city.

In most large cities there exist clusters where sordid, unhealthy houses are in great proportion and even in the majority, and inside of which throngs of people are gathered, whose mode of living, the limited means, ignorance of the most elementary principles of hygiene and cleanliness, predispose to diseases and physical loss.

These clusters of insalubrious houses are as many sources of contamination in which death, especially infantile death, reaches surprising proportions. The necessity of causing these clusters to disappear is uncontested by all those who have to deal with public hygiene. But, it is necessary to know those unhealthy spots, and the city authorities can only get a clear idea of them by establishing sanitary records of all the houses in the municipality. This index will be the guide which will lead them in such an important work as the finding out of the spots which must disappear. Then, the main obstacle to these ameliorations, made in the name of hygiene, is the expense these expropriations will cost. But, a good administration, helped by just and equitable laws, can reduce these expenses to a minimum cost. In fact, the point in view is to suppress speculators, who are always upon the watch for these great improvements and are an obstacle to their realization.

It seems to me that expropriation would be made more easy and just if the Legislature enacted that, for expropriation purposes of public interest the municipality could in a few years, let us say, three or four years, buy the land to be expropriated at the municipal estimate price of the last four years, plus twenty per cent. By this process, the municipality would know just exactly what the cost of a projected expropriation would be. The owners will be interested to see that their real estate is always reasonably taxed. Nowadays, the law rather seems, in matters of expropriation, to protect the private individual to the prejudice of the community; it is the reverse that should exist.

In concluding therefore, I may say that the great remedy for this sad state of affairs, which is deplorable in so many cities, is the education of the people.

It is education that will induce the citizens to choose representatives possessing the indispensable qualities distinguishing a real public man.

It is education that will make, out of all citizens, men animated with the desire of seeing their city, large, beautiful, sound and prosperous. To obtain such object, such men will not hesitate to impose upon themselves all the necessary sacrifices asked by the representatives they have placed at the helm.

PERTINENT REPETITION AN EDUCATION REQUIREMENT

BY WALTER S. CORNELL, M.D.

The dull and backward present a problem to the school authorities because they possess the right to a place in the public school, but are not able to keep up with the regular graded course of study. A clogging of the regular classes results. The dullards learn but little because they need individual attention and less daily mental

work; the brighter children lose valuable time because of the diversion of the teacher's activities to the relatively few dull pupils; the teacher suffers twice the wear and tear by reason of double work. For this reason an elastic curriculum and special classes employing special methods are necessary to an efficient educational system.

Editorial

JOSEPH LISTER

In the death of Lord Lister on the eleventh of last month there passed into the vista of history the founder of surgical cleanliness and all that term implies.

Joseph Lister, first Baron Lister, was born on April 25th, 1827, at Upton, Essex, England. Lister received his early education at University College, London, where he came under the influence of William Sharpey. Syme was at that time in the fore-front of surgeons and on Sharpey's advice, Lister visited Edinburgh with the view of "taking six weeks" of Syme's clinic." The six weeks extended, however, into years, for Syme's personality, teaching and practice made a great impression on Lister.—The marriage of Syme's daughter, Agnes, and Lister at the same time proved a union whose happiness terminated only with her death in 1893, leaving Lister as lonely in his affections as he afterwards became solitary in his fame.—In 1860 Lister was appointed Professor of Surgery in the University of Glasgow.

To realize the revolution in the means of healing and prophylaxis, the outcome of Lister's work, a picture of the state of affairs before the discovery of the microbic influence in the production of inflammation and destruction of the tissue must be seen. Since time began until the seventies of last century, when Joseph Lister gave his discovery to the world, dangerous inflammation was the ordinary sequel of what was always most eminently destruc-

tive and painful surgical interference—an interference which had become for all the final and most desperate of remedies. Almost all wounds then underwent a process of inflammation and supuration accompanied by much pain and many patients died rather than face the dread ordeal of operation. The miseries of crowded maternity houses, of the wounded in war and the horrors of field surgery at that time were dreadful.

Such an appalling state of affairs acted on Lister as a stimulus to strenuous endeavor in remedying the evil, and his great deductions in this work were: (1) That "putrefaction" in wounds was caused by microbes; (2) that these were introduced from the outside; (3) that "putrefaction" might be prevented by keeping the wound free from germs; (4) that this might be effected by the employment of some substance which would destroy the microbe.

The success that followed Lister in the application of antiseptics and the fact that Listerism now aims at the exclusion of enimical factors altogether, at asepsis, heralds, in the words of Saleeby's Tribute, "those imminent advances of science, preventive and curative which will substantially supercede any occasion for Listerism whatever, except in the noblest task to which this or any other form of knowledge or power can be called—that of serving those who give birth to the life of this world to come."

PUBLIC HEALTH AND SANITARY ENGINEERING.

The Public Health Journal recognizes that engineering hygiene is one of the most important features connected with public health problems. It is the province of the designing and structural engineer. This is especially the case with the engineer who

devotes his energies to designing plants and apparatus for the purification of water, the disposal of sewage and garbage, town planning, ventilation, etc.

At the recent Canadian Public Health Association Congress the necessity for

greater co-operation than has existed in the past between the engineer, the architect, the medical officer of health, and the chemist, was insisted upon. The sanitary engineering section of the Congress formed no mean part of the proceedings, and was attended by municipal engineers from both Eastern and Western Canada. The papers read dealing with leading features of engineering hygiene were discussed by both the doctor and the engineer to the mutual benefit of both professions.

Many of the questions which come under the head of sanitary engineering are new to Canada, and there is a decided tendency to ask for knowledge upon these subjects. This is especially true with reference to such subjects as sewage disposal, water purification and destruction of garbage. It is acknowledged on every hand that these questions must, in the near future, become the most important of the various municipal problems which require satisfactory settlement to the greater bene-

fit and better health of Canadian citizens. Although the Federal laws of Canada do not as yet insist upon the prevention of pollution of surface waters, many of the Provincial Governments are taking separate and drastic steps in this direction. Several of the larger cities and towns are at present adopting and have under construction modern plants for the purification and disposal of sewage, as well as for the purification of water supply.

The demand for the most up-to-date information relating to these problems, for technical descriptions of plants and approved apparatus and designs, will be fully dealt with from time to time in these columns. Many of the leading sanitary engineers are enrolled as members of the Canadian Health Association, being, therefore, subscribers to this journal, and it will be the object of our Publishing Committee to make these pages of practical value to the engineer, as well as of practical value to others upon whom the preservation of public health depend.

OUR FEDERAL BILL

At the Inaugural Congress on December thirteenth, fourteenth and fifteenth, 1911, in Montreal, under the chairmanship of First President, T. A. Starkey, it was deemed advisable by the members there in session to add a Federal Charter to the Ontario Incorporation, which had been obtained for the Association in 1910—following its inception by Duncan Anderson and L. M. Coulter, and the launching of its official organ, *The Public Health Journal, State Medicine and Sanitary Review*, earlier in the same year. The provisions of the proposed Federal Charter were, therefore, carefully drafted and received the approval of the two gentlemen—to whom the Association thus owes its beginning—and the approval of their confreres on the Provisional Directorate, A. J. Harrington, T. Aird Murray and Charles J. C. O. Hastings.

It was felt at the Inaugural Congress of the Canadian Public Health Association, in so deciding, that additional recognition obtainable from the Parliament of Canada would do much to strengthen the work of

this Association, although already of large proportions and wide influence, while at the same time leaving unchanged those desirable relationships guaranteed to its founders at the Association organization meeting, held in Ottawa in October, 1910, under Ontario Letters Patent—in respect to which the Canadian Public Health Association retains in perpetuity the policy control of *The Public Health Journal*.

Here, then, is Our Federal Bill preceding and embodying the provisions of the proposed Dominion Charter, continuing the Canadian Public Health Association and placing it more widely in the care of the citizens of this country, as a National Organization in every sense the most useful, far-reaching and momentous in the history of Canada:

*1st Session, 12th Parliament, 2 George V.,
1911-12.*

*The Senate of Canada.
Bill X.*

An Act to Incorporate the Canadian Public Health Association.

Whereas Duncan MacKenzie Anderson, M.D., and Lester McDonnell Coulter, M.D., publishers of *The Public Health Journal*, and Charles J. C. O. Hastings, M.D., Andrew Jerome Harrington, M.D., and T. Aird Murray, C.E., were incorporated by Letters Patent, issued by the Province of Ontario, as the "Canadian Public Health Association," and, whereas, it is expedient to extend the objects of the said Association by incorporating a new Association with the same name, but with more extensive objects to be exercised throughout the Dominion of Canada, and,

Whereas, a petition has been presented praying that it be enacted as hereinafter set forth, and it is expedient to grant the prayer of the said petition: Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. Charles A. Hodgetts, M.D., Colonel G. Carleton Jones, M.D., Major Lorne Drum, M.D., Sir James A. Grant, K.C.M.G., M.D., the Honorable Clifford Sifton, F. Montizambert, I.S.O., M.D., J. G. Rutherford, C.M.G., H.A.R.C.V.S., Charles H. Higgins, D.V.S., and Peter H. Bryce, M.A., M.D., all of the city of Ottawa, in the Province of Ontario; G. D. Porter, M.B., Charles J. C. O. Hastings, M.D., Duncan MacKenzie Anderson, M.D., Lester McDonnell Coulter, M.D., John W. S. McCullough, M.D., Helen MacMurehy, M.D., A. J. Harrington, M.D., T. Aird Murray, C.E., and A. E. Webster, M.D., D.D.S., all of the city of Toronto in the Province of Ontario; L. Laberge, M.D., Sir William C. Van Horne, K.C.M.G., E. P. Lachapelle, M.D., W. D. Lighthall, K.C., Ethel Hurlbatt, M.A., T. A. Starkey, M.D., Mrs. N. C. Smillie, J. E. Laberge, M.D., C. V. Valin, M.D., and Mrs. Grace Ritchie England, M.D., all of the city of Montreal, in the Province of Quebec; J. D. Pagé, M.D., of the city of Quebec, in the Province of Quebec; G. Macdonald, M.D., C.M., of the city of Calgary, and T. H. Whitelaw, B.A., M.B., of the city of Edmonton, in the Province of Alberta; R. M. Simpson, M.D., P. B. Tustin, M.R.S.I., and A. J. Douglas, M.D., all of the city of Winnipeg, in the Province of Manitoba; W. J. McKay, M.D., of the city of Saskatoon, and Maurice

Macdonald Seymour, M.D., of the city of Regina, in the Province of Saskatchewan; James Warburton, M.D., and Harry J. Johnson, M.D., both of the city of Charlottetown, in the Province of Prince Edward Island; the Honorable G. W. Murray, of the city of Halifax, and Smith L. Walker, M.D., of the town of Truro, in the Province of Nova Scotia; E. O. Steeves, M.D., of the town of Moncton, and George G. Melvin, M.D., of the city of St. John, in the Province of New Brunswick; W. T. Connell, M.D., of the city of Kingston, in the Province of Ontario; and C. J. Fagan, M.D., of the city of Victoria, in the Province of British Columbia, together with such other persons as hereafter become members of the Association, are hereby incorporated under the name of the "Canadian Public Health Association," hereinafter called "The Association."

2. The head office of the Association shall be in the city of Ottawa.

3. The objects of the Association shall be the development and diffusion of the knowledge of sanitation in all its branches, and all other matters and things appertaining thereto, or connected therewith.

4. The membership in the Association shall be divided into three classes, as follows:

(a) Active members, who shall comprise the persons named in section 1 of this Act, and all others who are from time to time admitted to active membership under the provisions of the by-laws of the Association;

(b) Associate members;

(c) Honorary members.

5. The Association, at its first general meeting and thereafter at any annual or special general meeting, may make rules, regulations and by-laws for the following purposes:

(1) The defining and regulating of the terms upon which persons may be admitted to active membership, associate membership, or honorary membership in the Association; the determining of the respective rights and privileges of the different classes of members; the fees, subscriptions and dues to be imposed on the different classes of members;

(2) The constitution, powers, duties, quorum, term of office and method of election of the Executive Council and the

Executive Committee; and the numbers, powers and duties of the officers of the Association;

(3) The time and place for holding the annual general meeting of the Association, which may be held at any place within the Dominion of Canada; and the notice to be given of the annual general meeting;

(4) The calling of meetings, regular and special, of the Association, of the Executive Council and of the Executive Committee, the notice to be given, the quorum, and the procedure in all things at any of such meetings;

(5) The administration and management of the affairs of the Association; and for this or any other purpose authorized by this Act, the Association may by by-law delegate any of its powers to the Executive Council, or the Executive Committee.

6. The first general meeting of the Association shall be held, within one year after the passing of this Act, at the city of Ottawa, or at such other place in Canada as is designated by the first Executive Committee.

7. At the first general meeting of the Association, and at each subsequent annual general meeting, the Association shall elect an Executive Council.

8. The Executive Council shall elect in the manner provided by the by-laws from time to time in force an Executive Committee.

(2) Charles A. Hodgetts, M.D., Colonel G. Carleton Jones, M.D., Major Lorne Drum, M.D., G. D. Porter, M.B., Charles J. C. O. Hastings, M.D., and L. Laberge, M.D., shall be the first Executive Committee of the Association, and until the first general meeting of the Association may exercise, on behalf of the Association, all the powers conferred by this Act on the Association.

9. The Association may acquire, hold and dispose of such real property as is necessary to carry out its objects, provided that the total value of such real property held at any time for the actual use of the Association shall not exceed two hundred and fifty thousand dollars.

10. The Association may receive gifts of real property, grants of money, or subsidies in any form whatsoever, from the Government of Canada, the Government of any Province of Canada, any municipality or any person; and shall apply the same in accordance with the conditions of the gift, grant or subsidy, or, if there be no such condition, in accordance with the objects set forth in section 3 of this Act.

INTER ALIA

The Second Congress of the Canadian Public Health Association will be held in the city of Toronto on September 18th, 19th and 20th, 1912—Charles J. C. O. Hastings, Chairman, and T. Aird Murray and Duncan Anderson, Secretaries of the Committee for Local Arrangements.

The common sense of the doctor question is pointed to by an English contemporary in debating the British National Insurance Act as that of the State regarding its doctors as public servants whose duty it is to preserve health. The question is put as to whether modern medical practice is not largely founded upon delusion, and the medical profession consequently maintained as a private one with financial interest in keeping people "ill." In making an affirmative answer our contemporary

does not blame the doctor, but attempts to show that healthy people mean bad times for a profession that depends for its livelihood upon fees from a "sick" public, and remarks that as long as that is so it is hardly likely to find a great enthusiasm among doctors for healthy people. "Why should the doctor exert himself to destroy his own livelihood?" it is asked.

One result of all this, our contemporary further remarks is an almost complete limitation of the doctor's interest to curative medicine to the neglect of more important preventive medicine. Diet, fresh air and the other common-places of hygienic living—how much is heard of any of them from the general practitioner? How much is expected to be heard? If patients are told to keep their windows

open who will provide the physician with payment he would otherwise receive for bottles of cough mixture? If the physician orders patients to put on the "brake" in matters of certain habits of eating, etc., who will compensate him for considerable annual loss? These are not idle questions. The doctor has to live, and while good deeds are no doubt all that Sunday school books say they are, it is an undeniable fact that they are not readily acted upon by the digestive juices and converted into bone and muscle.

Now we not only believe, but we know it to be common knowledge, that the medical profession in private practice is the self-sacrificing profession among all professions, yet there is truth in our contemporary's position—exaggerated though it may be—that if the State wants to keep this profession from becoming "a public danger and transform it into a real public service, we shall have to make the doctor something other than a private tradesman." In other words, we shall have to nationalize our medical profession.

Five times out of ten the most poorly ventilated building in town is the church. People complain of feeling drowsy during the sermon. Sometimes it is the minister who is to blame, but more often it is the lack of ventilation. Put a hundred or so men and women into a room. Keep them there for an hour and a half. Each one is breathing on an average 540 cubic inches of air a minute. At this rate without ventilation the air is likely to become stale even before the sermon begins. Besides this, the church has been closed all week. The air has had no change. No wonder it is bad. Why not air the building thoroughly before service begins by throwing open all the doors and windows. Give thought to the subject of ventilation. Perhaps you will find certain windows that can be kept open without annoying the congregation. Each church building has its peculiarities in this respect. A little time and ingenuity will no doubt solve the problem. The result will be fewer drowsy audiences and a healthier congregation.

The church has been said to be five times out of ten the most poorly venti-

lated building in town. The other five times it is the school. Again and again teachers complain of the stupidity of their pupils when the children are only sleepy because of the stale, impure air.

The disgraceful state of affairs that has, since our last issue, been brought to light by Dr. Bruce Smith's Mimico Industrial School Inquiry, should make all those responsible for the ignorance, stupidity, the fundamentally criminal habits of such management of such schools, the child-spirit, child-body breaking, the chaining and whipping practices, hide away in shame at their carelessness and betrayal of office. In this age of the proved success of humane and particularized educational and public welfare methods, no adequate excuse can be offered by any member of such Board or by any inspector for remaining unaware for any length of time of such brutalizing and unavailing beast-taming Mimico methods in any institution in any way under his control.

Last month in these columns, considering the question of mental defectiveness among children—always largely the result of bad environment (ignorance, disease, cruelty, starvation and poverty, and always finally preventable—in commenting on Dr. Helen MacMurchy's Canadian Public Health Association paper and her report on the subject to the Ontario Government, we pointed out the necessity of meeting the requirements of the weaker ones among our nation's children from an educational standpoint. Particularly pertinent are these remarks at the present time.

Another disgrace to any civilized nation is the withholding from woman of a vote in the making of the laws of her country, her right in this direction being as fundamental and as absolute as that of any other citizen. In England, David Lloyd George, Chancellor of the Exchequer, has recently made a speech in support of discarding from the life of England this *playful shackle* of the dark ages—at which for the welfare of the land, too many women have laughingly connived. Mr. George's stand is said to be favored by two-thirds of the British House. There, as elsewhere, this reform is bound to come.

CURRENT PERIODICAL COMMENT AND
WORKING NOTES

The Mind and Living Things.

Not less instructive, perhaps, than any record of progress in the last decade, writes C. W. S. in *The Pall Mall Gazette*, is a statement of the directions in which we are as we were. When we get down to root questions, those directions are obvious. We talk of life and we know what we mean. A crystal may imitate life in many ways, a machine in many more; but we know that the simplest living things differ immeasurably from any crystal or any machine, that the amœba, or a white blood-cell, performs feats which no machine can begin to rival. Naturally, then, biology asks the nature of life, and its origin. Indeed, it has been asking these questions for half a century, but least of all during the last decade. The reason is that we do not get on with the answers, and so we get tired of asking.

So long as we confine ourselves to the mechanism of life, the case is very different. Here the great new science of biochemistry makes long strides almost daily. Thus, we are convinced that the laws of physics and chemistry are never transgressed by the living organism. If it spends energy it requires to be fed with energy, just like a machine. The law of the conservation of energy is rigorously obeyed in the living body. It neither creates nor destroys either energy or matter. Its elements and compounds behave according to the laws of chemistry. It burns according to the law of combustion. Indeed, the last decade has helped us here by its development of the internal combustion engine, with all that that has meant for motoring and aviation. An amœba or a man is undoubtedly an internal combustion engine. The body takes oxygen into its interior, stores it, combines it with combustible substances derived from the food, and derives the energy of motion

therefrom. There is no doubt that this is *internal* combustion. It occurs in the very substance of the living protoplasm. An isolated muscle will contract in an atmosphere of pure nitrogen, and will give off carbonic acid gas, a compound of carbon and oxygen, showing that it has a store of oxygen which it has used within its substance. The laws of the motion thus derived are Newton's, the very laws which a planet or a bullet illustrates.

Further, we are learning much about the details of this machine, the living body. Its great agents are the special chemical substances called ferments. It makes them in the first place—evidently a somewhat unusual machine, this—and then uses them according to the laws of fermentation which can be observed outside the living body. Oxygen and sugar, say, will not combine at ordinary temperatures—the sugar in the bowl undergoes no “spontaneous combustion.” Yet they combine in the body, and the presence of a ferment explains the process. It is not miraculous nor exceptional.

In fact, we find ferments so universally employed in the living body, according to the laws of fermentation in general, and later we have found the development of the body to depend so largely upon the presence of ferments, or the antecedents of ferments, in the germ-cells, that we are tempted to frame a bold proposition, that “Life is a series of fermentations.” Every observation we make justifies the physico-chemical view of the mechanism of life, and we suppose that the secret is ours. The more are we encouraged by the work of Fischer, of Berlin, and his followers, who can construct, from their very elements, a host of bodies which we had hitherto found only in the living body. This synthetic chemistry has proceeded apace since the death of its illustrious founder, the

Frenchman Berthelot, and we can very nearly, if not quite, manufacture the proteins which are so characteristic of the living body.

Yet life is not "a series of fermentations," nor yet is an amoeba or a man only an internal combustion engine. These things are true, as far as they go. They tell us much, perhaps they summarize the whole, of the machinery. But they tell us nothing of the behavior of life. They show us, in large measure, how it does what it will, but they do not tell us *why it wills it*. Our imitation of the machinery is nothing to the point. A man, himself alive, can make an internal combustion engine; but that is not the first combustion engine that life has made, for the man himself is one, and the amoeba is another. The chemist can make sugar from its elements for his purposes, but so can the plant; this, then, is only a more recent case of life synthesizing sugar, and there is nothing new in that.

The truth is that the living thing employs the engine, and the "series of fermentations" for its purposes, just as the life in man, not content with the internal combustion engine and motor car which it made when it made man, has lately made extra ones for its service. Life uses machinery, such as the cell, the organ, the body; but it is not the machinery, any more than the maker is the motor car, or the synthetic chemist is his compound. And, further, life makes the machinery which it uses. If, now, we remember that life, in its highest forms, is associated with mind, we begin to understand why physical science, having gone so far, fails us in biology. There must be mind behind all this, as there is mind behind the motor car. Mr. Francis Darwin examines plants for us, and finds that they have sensations. Others observe microscopic one-celled organisms, animal and vegetable, and find that they *behave*, that they learn and choose and try. Of course, they use physico-chemical means, as the engineer or the poet does; but they are none the less engineers and poets on their humble plane. In short, as Bergson says, Life is "of the psychological order." How many places, in which the nineteenth century materialism made a darkness that could be felt, does this make plain?

Theories as to Cancer.

The National Review contains a suggestive article on the relation of cancer to gout and rheumatism by Dr. Haig. The writer informs us that the ailments cited above flourish under substantially the same conditions of sex, age and place, and draws his conclusions accordingly.

Thus he says gout is a disease of winter and of cold climates and is less seen in Southern Europe than in England and the North. Cancer has its higher European death rates in Switzerland, England, Wales and Scotland, which have cold climates; and its lower rates in Italy and Spain, which are warmer. In Egypt, he says, cancer is little known, as also gout and rheumatism.

Again, he maintains people are most subject to cancer at the same age as they are most susceptible to gout. Similarly women are less liable than men, and the poor than the rich. Thus in the richest parish in England in 1909 cancer accounted for one in eight deaths; in the "slum" parish of Bethnal Green for one in twenty, and other examples to the same effect.

Now, gout is caused, according to Dr. Haig, by uric acid—i.e., the "waste products of unnatural foods." Those whose wealth enables them to live too high, especially in cold climates, where perspiration is more difficult, are peculiarly subject. His parallel between gout and cancer is intended to prove that both are attributable to the same causes. Both diseases, according to him, are caused by the consumption of irritating foods which man in his natural state does not, or rather would not, feed upon.

Prominent among these, he states, are meat and tea, declaring that England, which heads the nations of the world in meat-eating, also has the highest cancer death rate; and that cancer is increasing in countries like the United States, where the consumption of meat and tea is also on the increase.

He further cites various authorities to the effect that natives of vegetable-feeding nations get cancer apparently without possibility of infection "when they begin to eat meat like Europeans, but only those who eat meat develop it."

However, even suppose cancer is due to a parasite, then Dr. Haig says his theory is still good, since if the diet does not suit the parasite the parasite cannot thrive.

How far Dr. Haig's theory has the indorsement of the profession is not a matter that concerns us. But as a reminder of the importance of temperate and judicious feeding his article is valuable, especially for those persons whose sedentary occupations do not permit them to take much exercise, so as to rid themselves by perspiring of the "waste products."

Polluted Springs.

Edouard A. Martel, the French cave explorer, in the course of his researches has developed an unusual knowledge of underground waters and in a number of communications to the scientific and medical press has called attention to various of the problems that come into view in a limestone country in which there are many caves. The general matter of the value and safety of so-called springs has been much discussed in Europe, where a great deal of the country is chalky or of limestone in which underground waters have worn out enormous caves, which are the collectors of the waters. There has always been the temptation to make use of water from the ground for domestic purposes since by tradition it is pure. In an article some time since in a medical journal Martel has taken up the matter of danger from waters of unknown origin and the present year has brought together the measures of precaution adopted in France since 1900. *The Official Journal of the French Legislature* notes the investigations of Martel and in the consideration of a number of outbreaks of disease, public notice was attracted to the risk of using waters issuing from the earth. It was shown that many of the waters supposed to be springs were those of streams reissuing, and to these for this reason has been given the name, regurgences. The spring, coming from sandy soil ought to be ideal, for there should have been filtering processes that would take from it anything in the way of impurity held in suspension, but in the cavernous countries the whole earth is seamed with tubes and tunnels, to say nothing of great

chambers and river courses, in which the water undergoes no purification. The French have accordingly made supervision by the authorities a requirement before a water may be used. In 1900 a law was enacted in the country that every taking of water for domestic purposes should be preceded by a geological study of the region and a bacteriological examination of the water itself. In 1902 a regulation for the care of the public health prescribed that no dead animals or wastes of house or stable should be thrown into the abysses or "puits," which are, so to speak, the chimney flues of the underground world. Before this time it had been customary to dispose of wastes in this convenient way without a thought that at the bottom of a hole two or three hundred feet deep the refuse could again come into contact with man.

In 1905 a regular committee of the Department of Agriculture took the matter up and has carried on every year some research which will tend to give a better understanding of the underground conditions affecting drinking water. One of the factors of opposition proved to be commercial interests, for Martel in some of his specifications of future conduct desired the care of wastes from manufacturing establishments. These had been exempt from the provisions of previous enactments, but it was evident that the filthy discharges of a factory mingled with its sewage could readily contaminate the potable waters used by some community at a lower level, and second under the exemption a manufactory was not obliged to exercise any care in the selection of water for the use of its employees. In 1910 an Act placed in the hands of the Minister of Agriculture the protection of non-navigable waters, the sources of water supplies and the like.

The matters in this respect to which M. Martel is at present giving attention are more particularly the wells of certain semi-public establishments, schools, railway stations, etc., which have not been considered under any particular official inspection. Further than this the indefatigable Frenchman seeks to place under effective regulation the location of cemeteries, the incineration of manure and wastes of circus or menagerie, the cremation of the

dead, which he looks upon as a highly necessary method of disposal, and the "everything-to-the-sewer" notion, which is the one at present in use in most civilized countries, but which in France gives the better opportunity for the underground streams to become contaminated.

In proof of what has been accomplished already, although important measures have not yet had full time to show their results, M. Martel notes that the typhoid fever rate has fallen in France from 34 per 100,000 inhabitants in 1891-1895 to 17 in the year 1908, with every reason to believe that it will still decrease.

The New Public Health.

A stirring note is being sounded by Dr. H. W. Hill, of the Minnesota State Board of Health, in the presentation in *The Journal-Lancet*, of "The New Public Health." Dr. Hill realizes that much of the popular belief in matters of the public health is antiquated and out of date.

Dr. Hill outlines the present position and notes that within official health circles bacteriology, clinical observations and mathematics have furnished much of the ground for reconstruction. The bacteriologist, the sanitarian and the vital statistician, sometimes working together and more often alone, in the dark and occasionally at cross purposes, have, nevertheless, all reached the same point and to-day find themselves together. Much of the work has been the clearing away of the fallacies built up by tradition, but construction work has also gone on and it is now possible to formulate the results.

"The essential change is this," writes Dr. Hill, "the old public health was concerned with the environment; the new is concerned with the individual. The old sought the sources of infection in the surroundings of man; the new finds them in many cases in himself."

The old public health sought the causes of disease in the air, in the water, in the earth, in the climate and topography of localities, in the temperature of the ground at different depths, in the rise and fall of ground water, in fact, everywhere where they were not. The failure of the old public health lies in this, and the faithfulness and conscientiousness with which the

search was made makes the failure the more evident. The new public health seeks these sources—and finds them—among those infective persons whose dejecta enter, usually by the mouth, into the bodies of other persons.

Dr. Hill outlines some of the older reputed causes of the dissemination of infectious disease. He notes that public water supplies have been found to be "routes of transmission," that milk was hardly suspected twenty years ago, that flies were not seriously considered till the Spanish-American War, and that mouth-spray and fingers have been recognized only very recently. On the otherhand, the list of suspected routes of the older ideas is quite long. It includes dirty clothes, bad smells, damp cellars, leaky plumbing, dust, foul air, rank vegetation, swamps, stagnant pools, certain soils, smoke, garbage, manure, dead animals and, in fact, all the items "physically, sensorially, ethically or psychically objectionable, which were lumped together as unsanitary, and were regarded as a sort of general cause of disease to be condemned wherever found, for fear of epidemics."

Dr. Hill further pictures the older ideas which obtain to-day, that the slum-dwellers live like pigs, for example, and thereby invoke the coming of smallpox, scarlet fever, typhoid and diphtheria. When these diseases invaded the homes of the well-to-do, where this explanation was not seemly, a pinhole in the waste pipes accounted for diphtheria; rotten potatoes in the cellar for typhoid; scarlet fever was traced to a letter from a friend who had the disease months before, smallpox to unpacking books of one who was a patient a quarter of a century previously; manure piles gave malaria, which was not recognized to be transmissible at all. Among these older ideas were those that yellow fever originated in impure water and was transmissible directly from person to person; tuberculosis was non-infectious and hereditary, bubonic plague was banished from Cairo simply by improving the ventilation of the city.

Upon such basis was constructed piecemeal the old sanitary code which, under the conditions of necessary conservatism and the lack of knowledge on the part of

the public is but slowly changing its position.

Dr. Hill notes that the New Public Health concerns itself with practical probabilities. The occasional, unusual, bizarre routes of infection may obtain in one per cent. of the cases, perhaps, so that there need be considered for the present the route of infection of the ninety-nine per cent. This is in the main through infected bodily discharges. This principle is the one to be borne in mind and it is along this line that the fight of up-to-date sanitarians will be in the future.

"The old-style sanitary inspector usually condemned everything in sight, from the garbage pail at the back door to the plumbing," writes Dr. Hill. Anyone who has had the care of real estate, especially suites or tenements, realizes the truth of this assertion without the need of much argument. "But disease continues," the writer goes on to say, "because he was condemning things largely irrelevant and immaterial. What availed it that the garbage pail was emptied every day or a vent pipe placed on the bath-water waste trap, if the milkman delivered scarlet fever infected milk or an unrecognized case of measles sat next the children at schools?"

The New Public Health sees in the garbage pail merely a place where flies are fed and possibly bred. But the flies cannot carry infection if infected discharges are not accessible to them. "Defective plumbing" has been conclusively shown to have very little to do with infection, the few items chargeable to it being extremes and with slight chance of their occurrence. The unventilated front parlor could not produce tuberculosis in a hundred years; diphtheria does not develop from the family well and (in Minnesota) typhoid is seldom traceable to the same source. The dirty back yard or damp cellar in themselves have no importance save only when they enter into the transmission of infected discharges.

In this line Dr. Hill further presents the situation in these words: "The sanitary inspection of the modern sanitarian, so far as relates to infection, begins and usually ends with the search for (a) the infected individual; (b) the routes of spread from that individual; (c) the routes of spread

of the ordinary excreta of ordinary uninfected individuals to the mouths of their ordinary associates in ordinary life." The latter studies are valuable because uncared-for infected discharges will follow the same paths as the ordinary uninfected ones and will necessarily reach the same mouths.

Considering the matter of environment, this authority notes that any surroundings that permit or encourage, or worse, necessitate the exchange of human discharges, are important since they are effective in the exchange. For example, the crowded tenement, if combined with lack of discipline and order and lack of facilities for washing, especially for the washing of the hands, contributes to the spread of infectious disease, but not until that disease has been introduced into the community. On the other hand, infection may spread without the factor of overcrowding if the factor to the spread of infection, exchange of discharges, exists.

Dr. Hill discusses quite at length the relations between environments and resistance. He notes that save in tuberculosis and pneumonia, the connecting evidence is very slight. It is a question whether overcrowding "depresses vitality" in the direction of increasing susceptibility to infectious diseases, whatever may be its bad effect on mental vigor or physical activity. It is in line with mal-nutrition, alcoholism and fatigue, it is true, and may ensure the development of infection which under better conditions and higher resistance might have been negated by the bodily strength. But these conditions cannot induce infection, nor will the converse conditions ward it off if there exist opportunities for the exchange of discharges.

United States National Department. of Health.

The Journal of the American Medical Association in a recent issue calls attention to a few errors into which, apparently, some persons and organizations have fallen regarding the proposed national department of health at Washington, and makes the following statement regarding the attitude of the American Medical Association on the question:

"The American Medical Association is a national professional organization of scien-

tific men, endeavoring to be of service to the people and to elevate the standard of medicine. It could not 'establish a monopoly' of healing if it desired to do so, and it would not if it could. It would limit the right to care for the sick to those who have sufficient knowledge of the human body to assume such a responsibility with safety to the patient and the public. And in this aim it should have the support of all right-thinking people. A national department of health would exist for the study and prevention of human diseases, and not for the treatment of individual patients. Many sincere but misinformed persons have opposed such action on the part of the Federal Government because they have not distinguished between disease and the person afflicted with the disease.

"A national department of health would study diseases, their cause, method of transmission and prevention, just as the Department of Agriculture investigates seed, soils, crops and animal and vegetable diseases. It would have no more authority over the individual invalid than the Department of Agriculture now has over the individual farmer. One of the favorite arguments made against a national department of health is that it would establish a 'State school of medicine' and would limit the practice of medicine to a certain class. This argument, of course, is absurd. The establishment of a Department of Agriculture has not resulted in a State school of agriculture, nor has the establishment of a department of commerce and labor brought about a State school of business or labor.

"Furthermore, every competent lawyer knows that the regulation and restriction of the practice of medicine, like that of any other profession, or calling, is a function of the individual State and out of the National Government. Congress has no right to say, and could not say, who shall or shall not practice medicine in Illinois or New York or California. Each State must settle this question as it sees fit. The American Medical Association is not responsible for the bills recently introduced into the Senate; they were prepared by Senator Owen, on his own initiative. The American Medical Association is naturally

in favor of such a bill and will do all in its power to secure its passage, but the credit of originating it is due to Senator Owen. The American Medical Association has urged such legislation for over twenty years. It will continue to urge it and to do everything it can to secure it, now and in the future, until Congress shows the same regard and gives the same care to human life that it now gives to animal welfare, to crops and produce, to banks and business concerns, and to the innumerable material interests of the people which the Federal Government now safeguards. The objections urged against this measure are either figments of the imagination, held by sincere but misguided and prejudiced persons, or specious and fallacious objections raised by those having a selfish interest in the perpetuation of existing conditions. The misguided must be enlightened and the selfish objections must be exposed. The more discussion there is on this important subject, the better. The more thoroughly the plan is understood, the clearer will its advantages be seen, and the sooner will it be become a reality."

The Aesthetic Side of Surgery.

We are not accustomed to associate surgery with the idea of beauty. But there seems to be no reason why the skilful surgeon should not beautify his patients as well as cure them.

A London surgeon in commenting on an article in *The London Lancet*, states that decorative surgery is by no means uncommon at the present time. "Of late years," he remarks, "with the development of surgical asepsis operators are more and more turning their attention to plastic surgery. Misshapen noses are made straight by cutting out deformed bones, scars are removed and replaced with healthy skin, and eyelids destroyed by diseases or burns have even been replaced by grafts from those of animals."

"Operations may be usefully divided into two classes," observes the writer, "into those which are required for the life, for the health, or for at least the comfort of the sufferer, and those which are performed merely to improve the personal appearance of the patient. . . . The dis-

tion between the two classes of operations can not always be drawn very clearly, for there are cases which lie on the border line. An operation for strangulated hernia is undoubtedly an operation of necessity, and equally certainly an operation for the cure of a saddle-back nose is an operation undertaken merely in order to improve the personal appearance of its owner. In these two cases the distinction is obvious. But is the cure of a harelip to be considered an operation of necessity or performed merely for the purpose of improving the patient's looks? . . . There can be no doubt that physical malformations which interfere in no way with the well-being of their possessor may yet cause an immense amount of mental torture to those who have them—an amount of mental pain which can hardly be imagined by those who are formed normally. A slight harelip, a nose with a sunken bridge, a nose with a bulbous end, the presence of a large mole on the face, even an overgrowth of hair on the face of a woman, may, harmless though they may be in themselves, be sufficient to make the lives of their owners intensely miserable. . . . It is easy to smile at this morbid sensitiveness, but it is important to recognize how vital a matter it is to those who are so afflicted. Even from a pecuniary point of view these deformities are not without importance. In several occupations a young woman will find a deformity of the face a very definite bar to employment, and she may be compelled to accept a lower rate of wages in consequence. . . . The absence of a nose may not in the least interfere with the working-powers of a man, but he will undoubtedly find that it will militate against his power of getting work. This diminution in the earning-capacity of those who have facial deformities is very real, and the knowledge of it, and the concomitant recognition of the fact that many people have an involuntary shrinking from those who are deformed, must act prejudicially on the mind of the victim."

This is why, the writer goes on to say, attempts to cure, to remove, or, at least, to mitigate facial deformities must be regarded as important. We have only to determine what limits there are to surgical

practice in this direction. The greatest care must, of course, be taken, and the fact that these operations are not performed with life dependent upon them, and, strictly speaking, need not be performed at all, must not persuade the surgeon to relax his watchfulness." He concludes:

"But the responsibility of assisting the public by cosmetic operations is upon the medical profession. If surgeons will not undertake the manifold operations belonging to this class, the unqualified practitioner will step in and will carry out inefficiently the work neglected by the surgeon. Without training and without due knowledge of the conditions and of the risks that are run in operating and of the precautions that should be taken unqualified operators do grievous harm. Already they venture to undertake much that is pure surgery, and the evil is growing. It is true that the surgeon is willing to operate on harelips and a few of the more striking deformities, but many of the malformations he will not touch. In skilled hands the risk and danger are small, and with practice the results may be very good. The work must be undertaken as a real and important part of surgery, and when carried out with care much misery will be saved and many men and women will be rendered more capable of earning a livelihood."

Reference Guide to Other Journals.

American Journal of Clinical Medicine (Vol. XIX, No. 2) "The Future of Medicine," by Maynard A. Austin; "The Physician and His Place in the Community," by Seth Scott Bishop.

American School Board Journal (Vol. XLIV, No. 2) "School Administration Problem in the South," by W. F. Doughty; "Some Waste Motion in School Administration," by Walter I. Hamilton.

Canadian Medical Association Journal (Vol. II, No. 1) "Under-Graduate Training and Requirements for License to Practise," by Alexander McPhedran; "Semmelweiss and Holmes," by H. E. MacDermot.

Canadian Municipal Journal (Vol. VIII, No. 2) "Town Planning for Toronto," by Helen MacMurchy.

Contract Record (Vol. XXVI, No. 8) "Good Roads—The Symbol of Progress," by R. E. Speakman.

Fruit Magazine (Vol. IV, No. 5) "The Great North Land of British Columbia and Alberta," by Hugh Savage.

Heating and Ventilating Magazine (Vol. IV, No. 2) "Important Points in Gravity Hot Water Heating," by John Jaeger.

Indian Medical Gazette (Vol. XLVII, No. 1) "Appointment to the Indian Army Medical Service Examination," by D. G. Crawford; "Indian Medical Service in 1911" Editorial.

Journal-Lancet (Vol. XXXII, No. 1) "Small-pox and Chicken-pox," by W. H. Hill, H. S. Plummer and William J. Mayo; "The New Public Health"—this is the 1st paper of what will constitute an excellent series—by W. H. Hill; (Vol. XXXII, No. 3) "Some Lessons from the Life and Labors of Helmholtz," by Casey A. Wood; (Vol. XXXII, No. 4) "Symposium on Syphilis," by N. L. Linneman and C. R. Ball; "The New Public Health"—second paper of this excellent series—by W. H. Hill.

Journal de Medecin et Chirurgie (VIIe. Anne, No. 1) "L'Enseignement Médical aux Universités d'Europe et d'Amérique," par Eug. Saint-Jacques; "Le '606' et les Médecins," par R. Falardeau.

Journal of the Outdoor Life (Vol. IX, No. 2) "Starting a Syrian Sanatorium," by Mary P. Eddy; "The Responsibility of the State in the Tuberculosis Problem," by Homer Folks.

Journal of the Royal Army Medical Corps (Vol. XVIII, No. 2) "The Anti-Bactericidal Action of the Bile Salts," by S. Lyle Cummins; "Insanity in the Army During Peace and War, and Its Treatment," by A. G. Kay.

Journal of the Royal Sanitary Institute (Vol. XXXIII, No. 1) "Conference of Engineers and Surveyors—Belfast Congress Address," by P. C. Cowan; "The Discharge of Sewage Into Tidal Waters," by W. S. Harper and A. E. Letts; "The Dust Nuisance," by John S. Brody; "Conference of Port Sanitary Authorities—Belfast Congress Address," by Robert Thomson; "Plague Precautions in Reference to the Destruction of Rats," by Herbert Williams; "The Importation of Unsound Food," by W. Hanna.

Journal of State Medicine (Vol. XX, No. 2) "La Theorie Physique de l'Immunité et ses Bases Experimentales," par O. Gengou (a suivre); "The Prevention of Plague in the Madras Presidency," by W. G. King; "The Effect of recent Legislation on the Control of Tuberculosis," by Nathan Raw.

Juvenile Court Record (Vol. XI, No. 6) "The Illegitimate Child—Its Place In the Community," by Hastings H. Hart.

Medical Council (Vol. XVII, No. 2) "Frost-Bite," by W. N. McCartney; "The Nurses' Registry Law in Illinois," by E. P. S. Miller.

Medical Officer (Vol. VII, No. 2) "Time and the Second Generation"—first instalment—by R. J. Ewart; (Vol. VII, No. 3) "Time and the Second Generation"—second instalment—by R. J. Ewart; "Health Visiting Under County Hospital Auspices," by A. Bostwick Hill; (Vol. VII, No. 4) "Time and the Second Generation"—third instalment—by R. J. Ewart; "The Outbreak of Typhoid Fever in Leicester Traced to the Consumption of Mussels," by C. K. Millard; (Vol. VII, No. 5) "Corporations and Controlling Organizations for Household Receptacles" by R. H. Pryne; (Vol. VII, No. 6) "Time and the Second Generation"—fourth instalment—by R. J. Ewart.

Medical Review of Reviews (Vol. XVIII, No. 2) "Peace and Occupational Diseases"—Editorial; "The Pathology of Good Health," by William S. Hubbard.

Monthly Bulletin, New York State Department of Public Health (Vol. VII, No. 1) "Vital Statistics for the Year 1911"—Report.

Oral Health (Vol. II, No. 2) "The Field of the School Nurse," by Lina L. Rogers.

U. S. Public Health Reports (Vol. XXVII, No. 4) "Epidemic Cerebrospinal Meningitis," by W. H. Frost; (Vol. XXVII, No. 5) "The Relation of So-Called Brill's Disease to Typhus Fever," by John F. Anderson; "An Acid-Fast Organism Resembling the Bacillus of Human Leprosy Cultivated from the Tissues of a Leprous Rat," by C. W. Chapin; (Vol. XXVII, No. 6) "Vegetables as a Possible Factor in the Dissemination of Typhoid Fever," by R. H. Creel; (Vol. XXVII, No. 7) "Investigation of Typhoid Fever at Texarkana," Ark.-Tex. (Milk Outbreak)," by J. R. Ridlon.

Sanitary Record (Vol. XLIX, No. 1157) "Engineering and Public Health Problems"—first instalment—by Arthur J. Martin; (No. 1158, Vol. XLIX) "Engineering and Public Health Problems"—second instalment—by Arthur J. Martin.

REVIEWS AND ACKNOWLEDGEMENTS

[Any book reviewed in this department may be obtained direct from the publishers, or from leading booksellers, or through The Public Health Journal]

"Modern Surgery and Its Making."

This book is Dr. Saleeby's tribute to Listerism and covers the subject in the fullest possible manner. He points out the lack up to as late as the second decade of the twentieth century of any book devoted to the most beneficent achievement in the entire record of science, surgical cleanliness; and now that the founder of surgical cleanliness has passed away this work speci-

ally will undoubtedly be in very large demand.

Dr. Saleeby covers his subject in seventeen chapters, dealing with Surgery as it Was and the Introduction of Anasthasia—Microbes,—Pasteur, the Fore-Runner—The Intervening of Lister—Critics—Antiseptic and Aseptic Methods—Listerism and Motherhood—Listerism and War—Surgery as it Is—The Record of a Case—Surgery and Alcohol—Florence Nightingale

—The Modern Nurse—Abuse of Listerism—Provision of Listerism—and The Promise of the Future. The frontispiece consists of a photogravure of Lord Lister.

Dr. Saleeby is a powerful public health advocate and sees the necessity of constant reiteration along this line; he does not yet believe that the public health conscience in the community is anything but a stripling. Repetition must be so continuous, he says, long maintained, and, if possible, varied, that at last by the action of certain psychological sequences which are well worthy of study for their bearing upon national policy and conduct, people begin to suppose that these ideas and arguments are their own. Again he says, the culture of racial life is the vital industry of any people. The tree of life and the tree of knowledge which grew side by side in Eden, and the tree of life whose fruit and leaves were for the healing of the nations in the Holy City, are all one: as we must realize if we are to make our cities and citizens holy and healthy—which are two forms of the same word. He also finds that the Press is beginning, in its news columns, to furnish some antidote to the lies which appear in the advertisement columns of most papers; but surely, he says, it would be to the public interest greatly to advance the general standard of knowledge in such matters.

Dr. Saleeby, in dealing with the subject proper, points out that as a result of Listerism modern surgery is essentially conservative and that large numbers of operations are now daily performed where there is nothing taken away; where, indeed, on the other hand, there has been positive construction achieved by the surgeon. Furthermore, the surgeon is now, as the result of Lister's work, above all, the enemy of inflammation, which is to say that he is the enemy of pain. *Modern Surgery and its Making. A Tribute to Listerism. By C. W. Saleeby, M.D., F.R.S. (Edin.), Fellow of the Obstetrical Society of Edinburgh, formerly resident physician to the Royal Infirmary and resident surgeon to the Maternity Hospital, Edinburgh. London: Herbert and Daniel, 21 Maddox Street W., England. 10/6 net.*

“The Principles of Sanitary Tactics.”

This book has been adopted by the United States War Department and is in-

tended as a guide for line officers as well as medical officers since the best use and proper tactical direction of medical department organization is a necessary knowledge for all commanders.

The author is well qualified by his experience and attainments to write on this subject and he has produced, in our opinion, a very valuable work, one, however, that should not be used for casual reading, but must be thoroughly studied. The book not only gives all the general information necessary to a comprehension of sanitary tactics, but tends to standardization therein and the subject is considered in detail for the benefit of those to whom sanitary tactics as a whole is largely new.—*The Principles of Sanitary Tactics. A Handbook on the Use of Medical Department Detachments and Organization in Campaign. By Major Edward L. Munson, Assistant Commandant, Field Service for School for Medical Officers; Senior Instructor, Department Care of Troops, School of the Line and Staff College, Fort Leavenworth, Kansas. Fort Leavenworth, Kansas: U.S. Cavalry Association, General Agents. Price, \$2.00.*

“Interstate Medical Symposium Series.”

We are pleased to be able to draw the attention of our readers to the above series, the first two numbers of which are “Recent Studies of Syphilis” and “Recent Studies of Cardio-Vascular Diseases.” Each volume is a compilation of advanced articles on the subject by foremost authorities.

The discovery of the spirochaeta pallida by Shaudinn, the importance of sero diagnosis and the experimentation of Professor Ehrlich in the matter of chemotherapy has made the subject of syphilis specially interesting at the present time. The volume before us is one of the most satisfactory we have seen; for this reason among others, that it is the work of several experts—and we believe with its compilers, that progress is never satisfactorily interpreted by one author.

Volume No. 2 of the series, on Cardio-Cascular diseases, is the work of such men as Arthur B. Hirschfelder, J. George Adami, Francis M. Pottenger, Hobart A. Hare, Walter W. Hamburger, Albert E. Taussig, J. L. Pomeroy, J. B. Gerstley,

Franz M. Groedel, E. H. Skinner, Alfred Friedlander, Louis M. Warfield, Albert Henry Beifeld, Hugo Ehrenfest, Isaac A. Abt, John M. Swan, William F. Boos, Wm. Engelbach, Auguste A. Housquains, Malvern B. Clopton—and gives the latest information on the subject.—*Interstate Medical Symposium Series: No. 1. Recent Studies of Syphilis, with special reference to Sero-Diagnosis, and Treatment. Second edition revised. No. 2. Recent Studies of Cardio-Vascular Diseases. St. Louis: Interstate Medical Journal Company. Per volume, \$1.00.*

“British Red Cross Society Training Manual.”

This is the manual issued and approved by the British War Office and is No. 3 of the series. It is intended as a guide, to those who have already acquired a knowledge of first aid and nursing, to acting collectively in carrying out red cross work. It is intended to accustom them to discipline and to stimulate them to exercise initiative and resourcefulness in constructing and applying improvised means of providing help, shelter and transport for the sick and wounded in emergency. The author is well known as an acknowledged authority on the subject and his book should appeal to all those interested in Red Cross work.—*The British Red Cross Society Training Manual, No. 3. Issued with the Approval of the War Office. By James Cantile, M.A., M.B., F.R.C.S., V.D., Hon. Surgeon-Colonel, R.A.M.C. (T.F.), with 8 full page plates and 136 illustrations in the text. London, New York and Melbourne and Toronto: Cassell and Company, Limited. 1/ net.*

“Central Station Heating.”

In “Central Station Heating,” Byron T. Gifford has produced the first authoritative handbook on the subject, his object being to further the interests of district supply in this respect. He believes that Central Station Heating in its broader sense is properly classed as a public utility and will eventually be controlled by the different utility commissions; and the author very fully explains the possibilities of this and its limitations. The book presents the most advanced practice in central

station heating, both steam and hot water and will be found an invaluable guide, not only to the engineer, but to all those where district heating is being or will be used.—*Central Station Heating. By Byron T. Gifford, Member American Society of Heating and Ventilating Engineers; Junior Member, American Society of Mechanical Engineers. 208 pages, with forty-two figures, including fifty pages of miscellaneous engineering data. Size, 6 x 9½ inches. Bound in flexible leather. First edition. New York: Heating and Ventilating Magazine Co., 1123 Broadway. 1912. \$4.00 postpaid.*

“The Wash-House.”

If one wants to know all about the wash-house he cannot do better than peruse the second of the Power Laundry handbooks, edited by C. F. Townsend, F.C.S. In this excellent little volume, among the very useful things considered are: I. General Wash-House Practice, including such things as classification of material, soft water, sorting, steam, soap liquor, water supply, speed of machines, etc.. II. Fog Marks; III. Cleaning Washing Machines; IV. A Note on Bleaching; V. The Removal of Stains; VI. Concerning Laundry Blues; VII. A Note on Color; VIII. Soaps, Alkalies and Silicate of Soda; IX. Blankets; X. Starching; XI. A Washing Machine Repair. An index follows.—*The Wash-House: All About It. With Many Useful Hints and Tables. By various authors. Edited by C. F. Townsend, F.C.S. London: The Power Laundry, 89 Farringdon Street, E.C., England. 1s. net.*

“A Manual of Fevers.”

Dr. Kerr writes this work particularly for students, but it will be found useful to all those interested in this important subject. It is compact in form and presents the subject under the fifteen headings: Infection — Immunity — Fever — Toxaemia — The Stages of Fever — Types of pyrexia — Management of Fevers — Prophylaxis — The Examination of Rashes and Throats — Measles — Rubella — Scarlet Fever — Smallpox — Vaccinia — Chickenpox — Typhus Fever — Enteric Fever — Diphtheria — Erysipelas — Whooping Cough — Mumps — Cerebro-Spinal-Meningitis. During his discussion the author denounces the use of

antipyretics such as antipyrine and advocates in their place sponging and plenty of water to drink. Dr. Ker is absolutely fair in his statements of facts and theories and is obviously an experienced, observant and broad-minded teacher. This is probably the best handbook on the subject which has appeared.—*A Manual of Fevers. By Claude Buchanan Ker, M.D. (Edin.), F.R.C.P. (Edin.), Medical Supt. City Hospital, Edinburgh, and Lecturer on Infectious Diseases to the University of Edinburgh. London: Henry Froude, Oxford University Press. Toronto: D. T. McAinch and Co., 123 Bay St. \$2.25.*

“Child-Nurture.”

Presenting child study from the parent's point of view, practically and simply, Honnor Morten takes the physical, mental and moral side together and points to our duty in letting the world lessons we receive have effect on those who come after us; seeing that our children and the nation's children “tread more softly through our sufferings.” The story of child study is well told and the handling of the subject as a whole displays the author as one without prejudice. In one part Honnor Morten, remarking that there are two sides to every story, presents this picture: “Of late years the unfortunate child has in many cases been ‘studied’ to such an extent that nothing natural, nothing of its own personality is left. It was ‘taught’ to play, ‘taught’ to observe, ‘taught’ to hear, ‘taught’ how to move, ‘taught’ to think. Instead of going and getting well scratched in a briar bush in a glorious effort to see the thrush's nest with its two little blue eggs it was taught to put its two hands together cup shape, call them a nest and sing sentimental twaddle about ‘little birdies’ in a strident unnatural voice. Instead of playing ‘robbers’ and ‘bear’ in the copse with other little children it had to prance up the lawn with elderly kindergartners of affected sprightliness and chant ‘Here We Come up the Green Grass.’”—*Child Nurture. By Honnor Morten. London: Mills and Boone, 49 Rupert Street W., England. 3/6 net.*

“Pure Foods.”

The object of “Pure Foods” is to present in simple language the result of scientific investigation to which foods have been

subjected during recent years. The work is the outgrowth of a series of lectures on foods given by the author, considering—What Food Is; What Pure Food Is; Standard Rations and the Cost of Food; Milk; Bacteria and Milk; Fats and Oils; Butter and its Substitutes; Meats; Carbohydrates; Candies; Aniline Dyes and Other Food Colors; Preservation of Foods; Fruits; Jams and Jellies; Fresh and Canned Vegetables; Bread and Cereals; Leavening Agents; Spices and Condimental Foods; Flavoring Extracts. The book is well adapted for use in domestic science and chemistry classes where the chemistry of food is studied and laboratory tests made for purity. The author gives a statement of legal requirements for pure foods and a list of references to literature on the subject so that those interested may peruse the subject still further.—*Pure Foods. Their Adulteration, Nutritive Value and Cost. By John C. Olsen, A.M., Ph.D., Professor of Analytical Chemistry at the Polytechnic Institute of Brooklyn, New York. Author of “Quantitative Chemical Analysis,” Editor of Van Nostrand's “Chemical Annual,” etc. Illustrated. Boston, New York, Chicago and London: Ginn and Company. 80c.*

“A Practical Hygiene.”

We believe that the handiest little book published has come to us under the above title from the pen of J. Stephenson, F.I.Hy. Its object is to place before teachers and students of hygiene and sanitary science some simple experiments illustrating the fundamental principles embodied in the subject, and we believe the book will explain many of the difficulties usually met with by students. The experiments are all arranged in tabular form under headings, What to Show, What to Do and Results; and every second page is blank for the purpose of making notes. Where necessary illustrations are inserted.—*A Practical Hygiene. By J. Stephenson, F.I.Hy., Demonstrator in Hygiene at Rutherford College, Newcastle-on-Tyne; Teacher of Hygiene under Gateshead Education Committee. Newcastle-on-Tyne, England: Doig Bros. and Co., Ltd., Heber Power Press, 53 Stowell Street. Price, 1/4 net. At all booksellers.*

"Dining and Its Amenities."

Dedicated, "to the deipnophilic brethren who have all contributed so much interesting and edifying lore during many years of the pleasantest reunions at the festal board," this book shows familiarity with the subject of "good cheer" which is surprising in an age of railway lunch counters and hasty eating. The author shows himself particularly well versed in alimentation science, and the information which he furnishes with point and grace is comprised under such headings as: The Role of the Senses in the Pleasure of Eating; The Refectory and its Appurtenances; Fragments of the Evolution of Cookery and Gastronomy; Ancient and Modern Banqueting; A Christmas Eve Dinner; Beverages; Fermented Liquors; Distilled Liquors; Tea Infusion; Coffee Infusion; Chocolate and Other Broths; The Seasoning of Aliments; Salty and Fatty Condiments; Of Cheese; Of Sour Condiments; Of Pungent and Aromatic Condiments; Of Sweet Condiments; Metaphoric Uses of Sweetness; Slang Speech; The Pleasure of Eating and the Pleasures of the Table; The Dessert; Anniversary Feasts; Dining Clubs; Table Jests; Table Superstitions; Fasting and Frugality, Luxury and Excess; Gluttony; Trencher Friends; Relations of Physical and Mental; Food Allowance to Warriors; Tobacco Smoking.—The work consists of a compilation of papers which were originally read before an association of medical men who met monthly for diversion and reflection.—*Dining and its Amenities. By a Lover of Good Cheer.*

New York: *Rebman Company*, 1123 Broadway. Bound in Cloth. \$2.50 net.

Publications Received for Later Attention.

The following books will be reviewed next month:—"Blair's Pocket Therapeutics"—"Cave, Mound, and Lake Dwellers"—"Digest of the Laws and Regulations of the Various States Relating to the Reporting of Sickness"—"Girls and Education"—*Gulick Hygiene Series*: "Good Health," "Emergencies," "Town and City," "The Body at Work," "Control of Body and Mind"—*Hazell's Annual for 1912*—"Health to Date"—"Home Water Works"—"Hutchinson's Hand-Book of Health"—"Manual of Natural Therapy"—"Modern Sewage Purification"—*Studies of Leprosy*: "The Artificial Cultivation of the Bacillus of Leprosy," "Attempts at Specific Therapy in Leprosy," "Immunity," "Further Observations in Rat Leprosy," "A Statistical Study of the Nasal Regions in Leprosy."

And this additional literature is here acknowledged:—"Activities and Publications," by the Department of Child Hygiene of the Russell Sage Foundation—"Full Measure of Responsibility," by William H. Pear—"Height and Weight of Dependent Children," by Milton A. Gershel, B.S., M.D.—"Ophthalmia Neonatorum," by The Massachusetts Commission For the Blind—"Ophthalmia Neonatorum: Progress in Prevention," by Henry Copley Green—"Possible Solution of the Midwife Problem," by Carolyn Conant Van Blarcom—"Practical Work in Sight Saving," by The Ohio Commission For the Blind—"Prevention of Blindness, No. 2 and No. 6," by The New York Association For the Blind—"Problems of Infant Mortality," by J. W. Schereschewsky, M.D.—"Report of First International Congress and Exposition," by The Chicago Association of Commerce—"Social and Moral Considerations Related to the Medical and Surgical Care of Crippled Children," by Douglas C. McMurtrie, M.D.

Open Mail

To the Editor, *The Public Health Journal, State Medicine and Sanitary Review.*

Discussion on "Engineering Problems Involved in Biological Methods of Sewage Disposal."

Sir:—I have been much interested in reading the paper of Mr. T. Aird Murray, published in *The Public Health Journal* (Vol. III., No. I.), and am glad to furnish some discussion thereon, in the light of the experimental work which I am conducting for the Sanitary District of Chicago, as well as of our engineering investigations.

Unless very greatly mistaken, Great Britain had a Royal Sewage Commission as early as 1860. Later, in 1888, the Lawrence experiment station was established by the Massachusetts State Board of Health, serving as a pioneer in the experi-

and France much has been done. Conditions abroad, however, differ radically from those in the United States. From these experimental stations much definite data has been accumulated.

Septic Tanks.—From the available data, I agree with Mr. Murray that it has been abundantly proven that the early claims of the promoters of the septic tank were greatly exaggerated. In general, I believe, however, that as regards the amount of sludge found in a septic tank, less will be found than in a settling tank, and more than in an Emscher tank. The accompanying table (infra), giving some of the results at 39th Street, is taken from a report made by me to our Chief Engineer, Mr. Wisner. (See Report of George M. Wisner, Chief Engineer, Oct. 12, 1911).

Table of Sludge Accumulations at Thirty-ninth Street Testing Station.

	Velocity Mm. Per Second	Period in Hours	Cu. Yds. Per Million Gallons (U.S.)	Specific Gravity	Per Cent. Moisture	Calculated to Dry Weight at 100° C.				
						Nitro- gen	Volatile Matter	Fixed Matter	Ether Soluble	
<i>Period October 15, 1909, to October 31, 1910.</i>										
Grit Chamber	14	0.13	0.32	1.07	84.5	1.5	47	53	6.1	
Original - - - -		0.13	0.33	1.07	85.2	1.9	54	46	6.8	
Remodeled - - - -		0.13	0.20	0.04	86.3	1.6	57	43	6.2	
Sedimentation - - - -	136	0.01	0.026	1.35	49	0.76	21	79	2.2	
Septic - - - - -	8	8	2.1	1.01	92	2.0	51	49	7.2	
		6	2.4	1.02	91	1.9	54	46	8.3	
		4	2.6	1.04	89	1.6	49	53	9.3	
		8	Max. 2.1 Min. 0.9*	1.04	89.4	1.7	40	60	7.6	
<i>Period of 8 months from June 1, 1910.</i>										
Emscher - - - - -		1 to 3	Max. 2. Min. 0.93†	1.04	88	1.6	39	61	4.4	

During the present year there has been less sludge retained in the Sedimentation tanks.

*This represents amount actually cleared out after ten months. It does not, however, represent a digested residue, as a deal of sludge was unloaded by the tank previously.

†This represents the average accumulation over a period of 5 months and is the residue of complete digestion, since no sludge was blown out of this tank by unloading.

mental field in the United States. From Lawrence came many ideas, adopted abroad as well as in the United States. In later years experimental stations have been operated at Columbus, O., Gloversville, N.Y., Waterbury, Conn., the Massachusetts Institute of Technology, Philadelphia, Pa., and Chicago, Ill. In Germany

The difficulty with the septic tank is the control of the unloading of the sludge by violent action. Our septic tank has, at times, over a period of two days, delivered five times as much suspended matter as in the influent, eventually blowing out all the sludge. In an examination of the sewage disposal facilities of a small town near

Chicago, I recently found a septic tank eight years old which had never been cleaned. Half the tank was full of peaty scum. The sludge was being unloaded into a ditch, making a nuisance for a mile or more below the tank.

Mr. Watson of Birmingham, has sensed this trouble, and was the first to introduce secondary settling basins and then scrubbing filters between the septic tanks and the sprinkling filters. I believe that his idea is correct, and that in any sprinkling filter scheme, a screen or scrubbing filter between the tanks and the filters is well worth trying, to reduce the cost of maintenance.

I do not believe, however, that separate sludge digestion in itself is a complete solution of the problem. A double deck tank of the Emscher type is desirable in order to have the settling matter always entering the digestion chamber in small amounts. At the 39th Street testing station, the sludge digestion tank (into which fresh settling basin sludge has been blown at frequent intervals) was the only nuisance on the grounds.

six months. The principle seems excellent. Recently a second tank of different design (Fig 2) was put in operation to handle the effluent of the coarser sprinkling filters. In the Emscher tank, it seems immaterial whether the flow be radial, or straight away, as in the diagram in Mr. Murray's paper. We are using a radial flow type on the grit chamber sewage with a flow of 20,000 gallons per 24 hours, with success. Depth is, however, essential, I believe, for a compact sludge, full of gas, to facilitate drying. This is a point which Mr. Murray has overlooked.

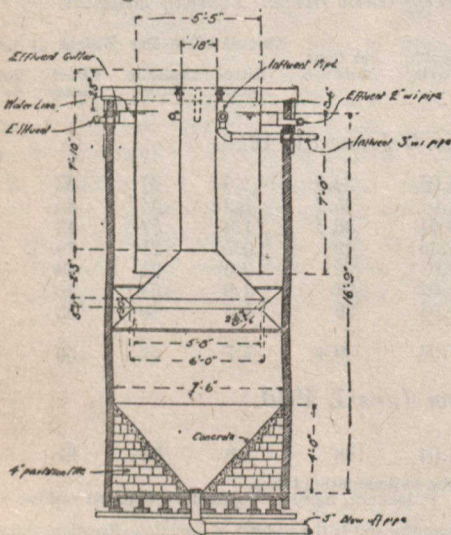


Fig. 1—Emscher Tank.

Emscher Tank.—We have been operating an Emscher tank at the experimental station for over 18 months, with very satisfactory results. The tank was recently remodelled, and is shown in the diagram attached in its present form (Fig. 1.) The sludge drives readily, is practically odorless, and is thoroughly digested in about

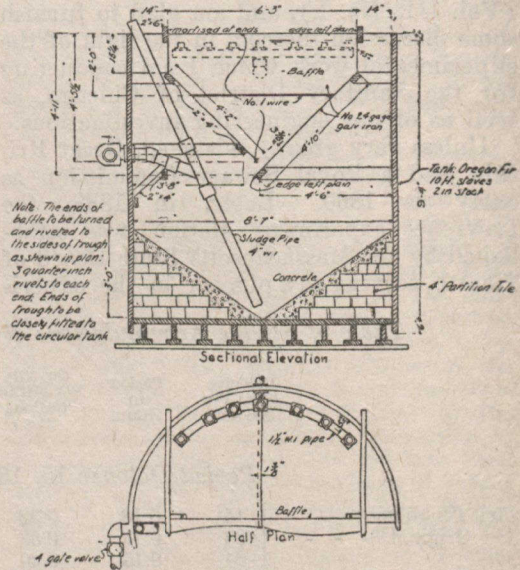


Fig. 2—Emscher Type, Settling Basin

Lethbridge Tank.—I have examined the design of the "Lethbridge" tank with much interest, inasmuch as Dr. Imhoff apparently designed a similar tank over three years ago, as shown by a drawing given me by him, dated 1907 (Fig. 3.) The dimensions are in meters. There are several points in Mr. Murray's design which are open to criticism, which does not apply to Dr. Imhoff. The use of glass for the cover of the sludge well and floor seems unnecessary, as I believe that the sludge would slide equally well on concrete after operating a few weeks. As a method of construction to reduce the cost of forms, the use of glass (or concrete slabs, cast outside) is worth investigation, particularly for the cover of the sludge digestion chamber. The slope of the floor is too flat, I

believe, for successful operation without means for scraping the sludge into the digestion chamber. Dr. Imhoff has provided such a scraper, to be used several times a day, preferably.

In Mr. Murray's design only small gas outlets are shown. From the writer's experience with various forms of tanks, these vents are too small, and would rapidly choke with the "swimming" sludge or scum. A larger area for gas vents would seem necessary. No dimensions are given on Mr. Murray's sketch. The sludge storage well, however, appears too shallow in depth to obtain the density of sludge which Mr. Murray claims. In the experimental tank at 39th Street, with a depth of over 16 feet, the moisture content of the sludge is rarely below 88 per cent. water. Depth is required to obtain a dense sludge. That is why Dr. Imhoff advocates depths of 30 to 40 feet.

So far as I can see, the principles involved in the Lethbridge tank are identical with the Emscher, and if the matter of depth be included, as it should, the factor laid down by Mr. Murray of saving in depth of excavation becomes of no consequence.

Sedimentation Problem.—The sedimentation problem depends on velocities of flow, either forward or upward, and not on the shape of the tanks, as such. With a knowledge of the critical velocities at which the desired size of particle is to be deposited, a designer should be able to build a tank equally effective, in either a rectangular flow, or circular upward flow form, so far as mere removal of settling suspended matter is concerned. For the purpose of ease in cleaning in purely sedimentation tanks, the writer has advised the trial of the Dortmund type, with hopper bottoms, to settle a very heavy industrial sewage in the stock yards. The comparative cost of the several types of tanks is well illustrated in the following table, prepared by me for the report of our Chief Engineer, Mr. Wisner:

Comparative Cost of Tanks.

Emscher	3 hours*	200	\$1.44
Dortmund	4 hours*	200	0.84
Straight flow	8 hours	200	0.77
Straight flow	6 hours	200	0.58

*In both these periods the sludge storage is not calculated in determining the nominal period of settling.

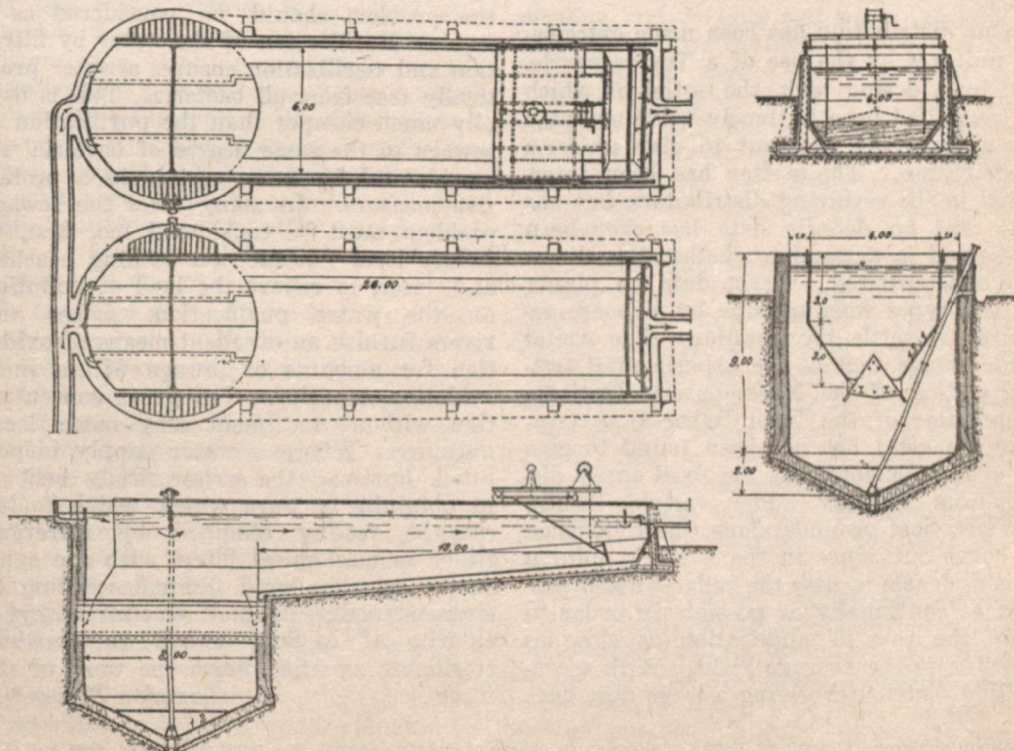


Fig. 3

Despite the greater cost of the Emscher tank, we have recommended its use for improving the condition of the domestic sewage in Chicago, because we believe it is the best type to-day for removing the settling suspended matter, with a minimum loss of freshness, and a means of producing the minimum amount of sludge, thoroughly digested and easy to dry.

Sprinkling Filters.—I have been much interested in Mr. Murray's remarks on distribution. At our experimental station we have been operating five open filters, one of which has rubble sides, and one covered filter, through two winters. During the second winter the covered filter gave consistently better results, both in stability and nitrification. The crude sewage (from an area of 22 square miles) was never below 43 degrees Fahr., and the maximum loss of temperature (through the rubble sided filter) was 16 degrees. Under the winter conditions at Chicago, we believe open filters can be operated with success. Owing to the restricted localities for cities, light covers may eventually be necessary to prevent serial nuisance.

Our distribution has been made extremely uniform by the use of a Taylor nozzle, fed by a dosing tank, the outlet of which is controlled by a butter-fly valve actuated by a revolving cam cut to give uniform distribution. The writer has been interested in the revolving distributors, but has felt that no definite data has ever been presented to determine whether the claims are substantiated. Exact data on plants of two types working side by side are required to settle the question. The writer understands that at the experimental testing station of the Massachusetts Institute distributor of the Ham Baker type (tipping buckets) has not been found to give as good satisfaction as the fixed spray distributors working under variable heads. On practical grounds alone, the conclusion is borne out, since in the writer's opinion it is desirable to dose the beds as uniformly and as continually as possible in order to keep the rate of application as close as possible to the average yield. With a travelling distributor giving a large dose once

only in five or ten minutes the effect certainly can not be obtained. Where land is valuable the circular beds cause a loss of space.

Size of Filter Material.—The size and depth of the filter material is all important. Undoubtedly the better results can be obtained with material as uniform in size as possible. The most favorable size for higher rates of treatment is 1¼ to 2 inches. With the dilute domestic sewage at the 39th Street testing station yields of 2½ to 3 million gallons (U.S.) per acre can be obtained. With a depth of 6 feet steady results are obtained. The indications are that graded material or fine surfaces are not economical.

Filter Design.—The usual design for sprinkling filters in the United States is to have the drainage from the outer to the inner portion of the bed. This permits thorough inspection of the underdrains, and flushing if required, since in the more recent designs the tile underdrains open into a gallery through the walls.

Discharge of Sewage into Water Supply.—The writer is firmly of the opinion that, wherever circumstances demand that sewage should be turned into a water supply, the problem should be considered as a whole. Purification of the water by filtration and sterilization ensures a water practically free from all bacteria. This is usually much cheaper than the purification of sewage to the same degree of bacterial removal, and far more certain as a protective measure. In many cases the sewage problem must be considered too, first, to relieve local nuisance on bathing beaches, and, later, to relieve the load of pollution on the water purification. Lakes and rivers furnish an excellent means of oxidation for amounts of sewage within their oxidation capacity. Too great concentration without treatment may mean local nuisance. Where a water supply is polluted, however, the writer firmly believes in obtaining a pure water, which to-day can be readily obtained by filtration, either in mechanical filters with a coagulant or on slow sand filters, according to circumstances. A small amount of hypochlorite of calcium makes an excellent sterilizing agent to finish the work of the filters.

Langdon Pearse.*

*Assistant Engineer, The Sanitary District of Chicago, in charge of Sewage Disposal Investigations. Assoc. Mem. Soc. C. E. Mem. Am. Public Health Association.

Remuneration of Medical Officers on Board Ship.

Sir:—Replying to the paper by Dr. Pagé in the January number of *The Public Health Journal* on the Medical Inspection of Immigrants on Shipboard, I can confirm all he says from my experience of 5½ years as surgeon on various lines.

The payment is inadequate for the services required, and, as a result, in many cases the companies only get what they pay for, the doctor making up the balance by having a good time socially and letting the hours covering surgery attendance in the morning and half an hour in the evening, with the daily (on some boats morning inspection suffice for his salary.

Regarding inspection as the passengers come aboard, that can, with a little trouble, be made pretty accurate, though rapid, if the surgeon likes, assisted as he is by the port doctor, and if he requires extra assistance, the companies will often provide it. Personally, out of thousands of passengers that came across with me, in twenty trips this way, to Philadelphia, Boston, Portland, Halifax, Quebec and Montreal, I have only had two rejections for medical reasons, one trachoma and one ringworm.

There is a want of uniformity in the diagnosis of trachoma among the medical inspectors on this side of the Atlantic, and I have, in rejecting passengers with trachoma, suggested that they be sent to a different port of entry, as what will pass in one, would not in the other. In that, of course, I was considering the company's interest, as I was paid by them.

As Dr. Pagé stated, the companies do not pay large salaries, and for that reason do not obtain always the class of men they should have, usually men just qualified who wish to see the world, have a rest and a good time after their studies, and who only go a voyage or two. Hence the frequent changes. I have been on fifteen different steamers. Occasionally they stay longer, but then the "call" of the sea, and opportunities for fees from passengers on the larger liners and often private income, is the reason. I love the sea and would be afloat if the remuneration were worth while, and the men who are adapted to the sea and like their work are invaluable to

the companies.

I see that some companies are allowing fees to be charged by the doctors for professional attendance, but when I was at sea, except on two lines where the medical superintendent told me to charge full shore fees according to the port we sailed from, I received instructions that no fees were to be charged under any circumstances. 6/8 or \$1.60 a day was enough for looking after 2,294 passengers and 283 in crew, or 2,577 souls all told.

One line used to allow the doctor a shilling a head extra for all pilgrims landed at or from Jeddah, and it was to the medico's interest to see that they kept healthy and alive for the 15 or 20 days they were aboard, as 1,000 to 2,500 shillings increased his pay for the voyage considerably.

Roughly outlining the duties of the medical officer on board, he inspects the passengers embarking, for the following: loss of limbs or fingers, blindness, deafness, dumbness, rashes, skin disease, general appearance for fever, or tuberculosis, and, if suspected, re-examines later, the scalp for favus, etc., and the eyes for trachoma. Attendance at the office or surgery morning and evening and daily (at least) inspection of the sanitary condition of the ship. On the way over, he inspects the steerage passengers (why not first and second-class as well, as often it is only a case of accommodation or cash that distinguishes them? for vaccination or smallpox marks, and vaccinates those not previously done.

Regarding this latter inspection, it used to seem to me to be a farce, when the United States and Canadian authorities did not compel vaccination among their own people and forced the incomers to be thus protected, and, at times, when United States and Canadian citizens have been returning from a visit across and refused vaccination, the authorities did not always uphold the ship surgeon's contention that they should be submitted to the same process.

What is the result? In Canada and the United States we have smallpox, like the poor, always with us, and if one does go to the trouble and expense of vaccinating a community, if some little legal quibble is omitted, one has the glory but not the pay.

In my own case here, I vaccinated some 50 people on the instruction of the Provincial Medical Officer to protect them from an epidemic of smallpox raging in the next town, as there was a case in the village, but because the County M.H.O. did not authorize it as well, I am still, after two years, without payment by the county, and likely to be so.

Then the laws of quarantine are not enforced, as the doctor does not want to offend his patients and thus neglects his duty to the public. I am in hopes some persons will take up this matter by suing the doctor in charge of infectious cases, not properly quarantined, for damages for illness occasioned by such neglect.

But to return to our subject, the pay of the ship's surgeons will only be increased when they demand it and organize to that effect, and it will then be to the company's interest to see that they take a course dealing with the health and hygiene aboard ship and make them attend to their duties if neglectful.

It is an easy matter, if attended to, to keep the crew's and passengers' health good by seeing that the vessel is kept clean; and prevention is much easier and better than cure, as I have found out.

As a result of attention to cleanliness and seeing that the crew slept in their bunks and not on deck at nights, I was able to keep my ship free from yellow fever on the Amazon, when the other seven steamers of the mail service all had it aboard; and when down the West Coast of Africa,

I returned with all my crew, not losing one from malaria or other disease, to the surprise of the officials in Liverpool.

If the steamship companies will not pay their medicos a decent salary and increase their efficiency, the Canadian Government should follow the example of the Italian Government and put their own trained doctors on board in charge of the immigrants and make the companies pay half their salaries.

Five dollars a day is not too much, and this to be continuous while the steamer is in the home port, not like at present in some lines, as soon as the ship arrives pay stops till sailing-day. Most of the Liverpool s.s. companies nowadays allow shore wages.

Taking it as a whole, it is wonderful how few rejectable cases are brought across, and this demonstrates the care generally exercised by the surgeon, with the exceptions pointed out by Dr. Pagé.

I have had experience with the regulations of the following countries, which vary considerably, British Isles, Germany, France, Spain, Portugal, Italy, Egypt, Ceylon, Australia, China, Japan, Manilla, Brazil, Peru, Mexico, the United States and Canada, and have come to the conclusion that it is due to the surgeon's care for the health of the crew and passengers that the British s.s. companies are so successful in having a death rate of practically nil, but he does not get the credit.

Victor F. Connor, L.R.C.P.I.
Hantsport, N.S.

Meetings and Reports

[Material for this department to appear in any month should be transmitted before the 25th of the proceeding month.]

DOMESTIC

Alberta Health Act and Its Relation to Medical Inspection.

Trustees from all parts of Alberta who were present to consider matter appertaining to the preservation of the health and to the general welfare of the school children at the sixth annual convention of the school trustees, held recently in Calgary, an excellent address by Dr. L. Barrow (in the absence of Dr. L. E. W. Irving, who was unable to be present upon the Provincial Health Act and its Relation to School Sanitation and Medical Inspection.

Dr. L. Barrow said that a most important thing in considering the question of school hygiene was ventilation. Ventilation not scientifically arranged was as bad as insufficient ventilation. It was no good having ventilation so that only the floor was ventilated.

Then as regards the heating of the schools. In the large and modern schools steam and water heating was in vogue, but in the small country school houses where the closed stoves were used, there was considerable danger to the health of the pupils from the gases which were generated by the hot stove and also by the uneven heating of the room. The rooms and desks should be cleaned every day with disinfectant and not merely by sweeping. It was no good studying economy in these matters as it only cost more in the long run for doctor's bills for the children.

Wash basins, soap, towels and all other things used in the lavatories in the schools should be kept disinfected, and should be scrupulously clean. In every washbowl there lurked germs of infectious diseases. The same towel should never be used by different children. Paper towels were a very good innovation, and it is probable that in the future these will be used as they can be torn off by the child after use and thus every child gets an unused and clean towel. The expense would be very little

greater than by using the linen washable towels. By the new regulation, after the first of the month, there will be no drinking cups and bowls, and in the country districts where the water system is not available, paper cups will be used. These cups after use can be thrown away and fresh ones used.

In the districts where wells have to be used for the water supplies they should be kept covered when not in use and also the ground around the immediate neighborhood of the well should be kept quite dry. Wells, like Caesar's wife, should be "above suspicion."

All windows should be provided with blinds so that the light can be regulated. Slates were one of the worst inventions as far as being prejudicial to the health of the children went, that were ever invented. In all schools where they are still in use they are to be abolished at once.

Another question of vital importance to the health of the growing children was the seats. Taking the average school life of the child they are sitting for 8,400 hours altogether during the time they attend school, and great and lasting damage can be done by causing the children to sit in uncomfortable and unscientifically constructed seats. All seats should be of the adjustable variety that can be made to suit the size of the occupant. These chairs, although more expensive, are cheaper in the long run, as they undoubtedly preserve the children's health.

Under the Provincial Health Act the medical inspection of schools is not provided for. In the rural districts they are at a disadvantage in the matter of infectious diseases as in many cases the nearest available medical assistance is many miles away. In all cases where the teacher suspects the child of suffering from an infectious disease, that teacher must at once

notify the School Board, and also the nearest doctor. According to the regulations no person suffering from tuberculosis shall be allowed to teach in school, and although this regulation may reflect hardly upon some of the teachers, some individual sacrifice must be made in the interests of the scholars.

With the exception of children in small country schools where medical advice is not available, and in the case where the doctor has granted a certificate to the effect that a child is not a proper subject for vaccination, every child entering a school after January 1st, 1912, shall have to prove satisfactorily that it has been successfully vaccinated. Many people will think this a new regulation, but it has been in force for many years past. Steps are being taken to enforce the regulation better than formerly. Of course children who have already been successfully vaccinated will not have to undergo any fresh vaccination.

Across the valley to the south over the line where there are no proper precautions against vaccination, smallpox epidemics are common occurrences. In only one case out of a thousand does a person who has been vaccinated contract smallpox.

Dr. Barrow brought up the question of venereal diseases and their relation to the work of the schools. He said that his hearers might wonder what such a subject could have to do with the school children. He meant that if the children were enlightened as to the causes and the results of venereal diseases, they would know what they had to face and would be on their guard. As it is, said the speaker, there is an amazing amount of ignorance on this subject, and he was convinced that if young men and women were taught something on the matter it would have great importance in the stamping out of the social evil. The time to teach on the subject was before the children were exposed to the evil, and not afterwards. He proposed to have lectures delivered to the children in the classes. The parents are extremely loth to do anything in the matter, and, therefore, it must be taken up by the school authorities.

At the conclusion of the address suggestions were made upon the matters brought up by the speaker. All the delegates thought that the question of the teaching

as to venereal diseases was a matter of vital importance and one which should be dealt with at once. A suggestion that the local physician should be called in to give lectures to the children at regular periods and conduct classes was received very favorably. Nothing definite was settled as to what should be done at the present.

An anomaly was pointed out in the provision that all children of the prescribed age should be compelled to attend school and that at the same time it was provided in the Public Health Act that no child should be admitted without having been previously vaccinated. The Public Health Act was quite definite on the point and it was thought it should stand.

In the country districts it was very difficult to enforce the regulations as to regular attendance, and many of the parents ignored the regulations altogether. There was no truant officer to see that the children were made to attend.

There should be medical inspection in the villages and rural districts as well as in towns, and it was thought that there should be medical as well as epidemic inspection the same as they have in all the schools in California. Another suggestion was made that all the children should have a card and a record of its health kept, and when it moved to any other district the card should be taken with it, and thus a record of its health during all its school attendance made. In cases where the children were not being kept clean they should be properly looked after and the parents notified that the children were being neglected.

Ottawa Sand Filtration Plant.

Plans are being prepared for sand filtration plant in Ottawa, Ontario, to cost \$1,000,000 on Lemieux Island. Steps to be taken to have the island deeded to the city by the Dominion Government and included in the city limits. In addition to the plant, consisting of six concrete filter beds, a concrete storage reservoir will be built.

Canadian Quarantine Regulations Regarding Hair.

Rodolphe Boudreau, Clerk of the Privy Council, has given notice of an amendment to the Quarantine Regulations established

by Order-in-Council of the 12th June, 1907, in virtue of chapter 74, Revised Statutes of Canada, entitled, "An Act respecting Quarantine," should be amended with a view to making provision against the introduction of disease into the country from the importation of Chinese hair, as follows:

The following paragraph shall be inserted after the word "solutions" in the twenty-second line on page 15 of the annexed Quarantine Regulations:

"Human or other hair unmanufactured or uncleaned must be unpacked, and disinfected by steam, or boiling water, before it is allowed entry into Canada."

The following question shall be inserted on page 22 after word "cargo" in question No. 4:

"Is there any human or other hair unmanufactured or uncleaned in such cargo?"

Health Laws of Quebec Locally Ignored.

Inspectors of the Provincial Board of Health of Quebec were hurried recently to St. Anne de La Perade, and St. Casimir de Portneuf, two small centres midway between Three Rivers and Quebec City, in response to complaints sent to Provincial headquarters, regarding small-pox conditions prevailing in these municipalities. Judging by the signed statements of residents, it appeared that matters had reached an aggravated stage, in regard to neglect of precautions to control the disease, in the two municipalities mentioned. That there were so many cases, that the victims were walking about the streets, thus being a source of infection to all with whom they came into contact, was the burden of one communication, whilst other complaints avered that so bad a stage had matters reached that one might meet a friend in the streets in the morning, only to learn later in the day, that he had been taken down with the disease.

On receipt of the information, the Provincial authorities took immediate action, and on arrival of the inspectors on the scene, a large college at St. Anne de la Perade was placed under quarantine. It is stated by Dr. Pelletier, the Secretary of

the Board, that the instructions of the Health authorities were utterly disregarded by those in charge of the college, as it was found that general vaccination had not taken place amongst the pupils. Moreover, it was discovered that smallpox existed in the college, and that no quarantine had been declared in the institution.

From advices received it appears that the infection reached St. Anne de la Perade from St. Casimir, where the disease first broke out. At any rate, the complaints received from the former place were to the effect that the outbreak there was directly attributable to the neglect of the St. Casimir people to take any precautions to control the disease, when it had broken out within their municipality.

According to statements issued at the head office of the Provincial Board of Health, the smallpox situation throughout the Province of Quebec has been growing worse during the past few months. The monthly figures covering reports handed in to the Provincial authorities, show that, during the month of January, no less than 56 municipalities made open declaration of smallpox within their borders, this latter figure being fully 50 per cent. greater than the number of such declarations handed in in the course of the preceding month.

In the case of the St. Anne de la Perade and St. Casimir outbreaks, the inspectors have been hard at work locating cases and enforcing all health regulations in regard to them. So great was the number of cases that it was almost impossible to establish quarantine in each instance, but the work of the officers from the Provincial office consisted in urging upon the local authorities the necessity of taking immediate steps to control the situation.

Communicable Diseases in December, 1910-1911, in Ontario.

The following statement of communicable diseases in the Province of Ontario for the month of December, 1911, as compared with December, 1910, has been issued by the Ontario Provincial Board of Health:

Diseases	1910		1911	
	Deaths	Cases	Deaths	Cases
Infantile par alysis	14	2
Cerebrospinal meningitis . .		8	2	2
Smallpox	33	..	41	..
Scarlet fever..	494	15	264	19
Diphtheria . .	263	36	355	31
Measles	339	7	112	2
Whooping cough	28	6	5	1
Typhoid fever	134	30	197	21
Tuberculosis. .	113	77	113	68
Total	1,428	181	1,089	144

The decrease noted in December, 1911, is stated to be due to the large diminution in diseases among children. The population of the Province is approximately 2,500,000.

Ontario Good Roads Association.

The convention of the Ontario Good Roads Association, which was held in Toronto at the County of York Municipal Buildings, 57 Adelaide street east, on Monday, February 26th, and the two following days, gave an impetus to the good roads movement in the Province. The previous meetings of this Association have been noteworthy for their practical nature and for the presentation of valuable papers. At the last preceeding convention, which was also held in Toronto, every county in the Province was represented, and, in addition, numerous city, town, village and township municipalities.

A great deal has happened in Eastern Canada during the year. The Province of Quebec is contemplating an expenditure of ten millions on road work and important plans have been formulated by the Ontario Legislature. The point is that these developments have elevated such organizations as the Ontario Good Roads Association to a position of national importance.

Halifax City Health Board Ordinance.

Secretary John A. Watters, of the Halifax City Health Board, has given notice of an ordinance to amend Ordinance No. 26 of the City of Halifax, to the effect that

on and after the 1st day of June, 1912, no swine shall be kept by any person in the city, except by a butcher for purpose of slaughter, and then only for a period not exceeding two (2) days.

The Suppression of Tuberculosis.

During the past two months two notable gifts, in which all Canadians have interest, have been made for the cause of those who are combating the plague of tuberculosis. The Messrs. Reid, of the Newfoundland Railway, and allied enterprises, have received the thanks of the Prime Minister of the island colony and of the city of St. John's, for a gift of \$100,000, one-half to be devoted to the establishment of a hospital at the capital and one-half for subsidiary institutions at the smaller centres of population. It has also been intimated that the Government of Quebec would do its part to make available the hospital near Montreal towards the construction of which Mr. J. H. Burland and members of his family have promised to contribute \$100,000. People were slow in recognizing how serious is the drain on the resources of a country, and of the world, of the oldest, the most widely spread and the most fatal of diseases. Familiarity hardly bred contempt for it, but it caused people to have no wholesome dread of what is rightly called a plague. It was only when the patient research of men like Koch made general a right knowledge of the nature and characteristics of the disease, and when many physicians, out of love for their fellow-men, added the results of their study, that the public began to understand that a consumptive did not of necessity have to die of the disease with which he was stricken, that tuberculosis of the lungs could be checked, and even, in cases, could be cured, and that there was in the situation room for the work of philanthropists as well as of public health bodies.

The Report of Dr. Severin Lachapelle.

Dr. S. Lachapelle recently presented to the city of Montreal his first report on *Les Gouttes de Lait*. It is an elaborate work filled with figures, and is, at the same time, a valuable document.

Dr. Lachappelle goes back to the origin of the movement for the protection of infants. This movement had its origin in France—France, which cried in face of a decreasing birthrate, “My children are few, but they are all lions.”

In Canada we haven't to complain of a dearth of little ones, but there is nothing to prevent our making them “lions” in strengthening them and to prepare them against extreme dangers. Thus we could repeat, like the lion in the fable, what we have just quoted France as having said. Such is the thesis of Dr. Lachappelle. He makes special reference to the work of those budding institutions, Les Gouttes de Lait, situated in the quarters of St. Joseph, St. Jean Baptiste, St. Denis et Hochelaga.

Dr. Lachappelle finishes by recommending the installing of a Goutte de Lait in each parish, the inaugurating of visiting nurses for the homes, a grant of \$300 for the Goutte de Lait, which is sufficient.

Dr. Lachapelle says, in part:

The stress and noise of daily life until now seems to have stifled the cries of dying babies and the sobs of despairing mothers.

However, a great reaction took place a few years ago. France first became alarmed in the face of a decreasing birthrate and cried, “Let us save our children, preserve those we have—let us strengthen them so as to be able to repeat the answer of the lion in the fable to the fox who was mocking him—My children are few in number, but they are all lions.

This movement started in France, went round the world, and everywhere efforts were redoubled to help the new born babe to overcome the dangers of the first year. For the chief danger is then. One-half of the deaths everywhere is found to be among infants in their first year.

In 1909, out of 6,111 deaths, 2,936 were under one year. In the United States it is said out of 1,500,000 births 300,000 did not attain their second year and we are doing nothing to save these who could so easily be saved, when we spend millions to benefit the 160,000 tuberculosis patients who die every year. In France ten years ago the league against infant mortality was founded. In the United States the American Association for Study and Pre-

vention of Infant Mortality had its first congress in Baltimore in 1910, and its second in Chicago in November, 1911.

In 1911, Montreal, working for the “Better Montreal,” assisted the movements already privately organized, and several “Gouttes de Lait” were started.

You will find below the reports of these budding institutions in the four quarters of St. Joseph, St. Jean Baptiste, St. Denis and Hochelaga.

Clinics on infants in the Parish of St. Joseph.

	Infants.
Registered	242
Cures	190
Benefited	20
Deaths	17
Distributed 4,276 pints of homogenized milk.	
Distributed to the poor 1,000 pints.	
Medical service every morning from 8 to 10 o'clock.	

Gouttes de Lait, St. Jean Baptiste.

	Infants.
Registered	123
Cures	111
Benefited	7
No change	1
Deaths	0
Homogenized milk distributed 1,940 pints.	
Number of consultations, 922.	
Medical services every morning.	

Gouttes de Lait, St. Edouard.

	Infants.
Registered	103
Cures	84
Benefited	4
No change	6
Deaths	9
Homogenized milk distributed 1,400 pints.	

Gouttes de Lait, Hochelaga.

	Infants.
Registered	122
Deaths	0

According to these tables during the months of July and August 590 infants were cared for with a mortality of only 5 per cent., which is much lower than the ordinary death rate of infants under one

year in these same localities. This result is the work of a number of doctors who have given their services gratuitously in more than 3,000 consultations and distributed nearly 10,000 pints of homogenized milk.

Comments on the above figures are unnecessary. But the conclusion to be drawn is obvious. Increase the number of Gouttes de Lait, it is one of the best means of diminishing infant mortality. Give a sufficient grant to each district which has a Goutte de Lait whose work is giving satisfaction and our infant population will benefit accordingly. The Goutte de Lait is not only a distributing centre for milk in proper quantity and quality, but also and perhaps even more a bureau for advice to mothers which advice is repeated in the home by special children's nurses trained to that end.

With continuous and persevering work popular errors will be corrected, the prejudices of ignorance will diminish and the zeal of the educator will triumph.

Confidence gained the physician will no longer be called in at the end, but at the beginning.

What are the causes of infant mortality? Poverty, ignorance and negligence. A great American specialist has said: Reverse the terms and it will be more correct at least as far as we are concerned—ignorance, negligence and poverty.

Ignorance.—The greatest evil. There is the ignorance which consists in not knowing the simplest and most elementary things, viz., rules of feeding. There is also the ignorance which believes in all the prejudices and popular errors, viz., that doctors do not pay attention to babies, etc. babies' sicknesses, etc.

The education of the mothers we insist is the best remedy, and the wonderful results of the Goutte de Lait are due as much to their dissemination of knowledge to the mothers as to the milk they distribute.

The excessive death rate in the poorer quarters is due more to ignorance than to the unhygienic conditions surrounding the child.

Negligence.—Is perhaps mere indifference. The child comes so easily that one can almost understand this indifference,

especially the paternal carelessness—the child simply doesn't count.

Yet this negligence is really criminal! How is it that the law protects a child more before its birth than afterwards? It is right that the law should punish any criminal attempt before birth. Would it not be equally right to prevent certain conditions surrounding the new born infant which kill more slowly, perhaps, but as surely?

Poverty.—May be put at the head of the causes of infant mortality elsewhere. We believe that it should be put last with us. We have fewer millionaires, but we have also fewer poor. A study of the reports already given show this to be true as the amount of milk given away in three quarters was insignificant and in the fourth the increase was small.

The fatal troubles of the first year are from 50 to 75 per cent. due to digestive derangement. These digestive troubles are caused by alimentary errors, physical, chemical and biological errors in the composition of the milk. The wrong quantities and qualities, and the fatal mistake of mothers not nursing their babies.

The first truth to be taught is, "Mothers, nurse your babies." The mother's milk belongs to the child. It is only when it is absolutely impossible for the mother to nurse her child that we must have recourse to other milk.

Most often we have to deal with intestinal dyspepsia and the elimination of whatever is causing it will generally bring the child back to normal. In cases, however, of cholera infantum, which are most difficult and rapid, and sometimes leaves a dangerous chronic condition, the only possible cure appears to be a removal from their surroundings. Therefore added to the Gouttes de Lait should be a sanatorium in the mountains or on a boat.

The city of Montpellier has a mountain sanatorium where the deaths of infants from febrile gastro-enteritis and cholera infantum were 3.8 per cent., as against 80 per cent. cared for in the city.

The people of the United States seem to have obtained the same results from their house-boat sanatoriums.

Montreal has its mountain and could easily also have boats, but she can do better still, she has her little islands but a

step from her door—which are like cradles of verdure and shade waiting for the little ones.

Yes, make of these islands cradle sanatoria. Let the city take one of these islands and transform it into a health resort that the poor may all have a place with large pavilions at their disposal. Let there also be small pavilions for so many families, for the mothers too proud to plead poverty, but also too devoted not to make the sacrifice for the sake of their sick babies. Montreal could do nothing that would beautify her more.

The conclusions of this report are easy to draw:

1. A Goutte de Lait in each district.
2. The training of children's nurses for domiciliary visits.
3. The medical service at the Goutte de Lait should be daily during the months of June, July and August, weekly or bi-weekly, during the other months.
4. The education of the mothers being the mainspring in the formation of the Goutte de Lait, the school of popular child hygiene should be held by the doctors of each Goutte de Lait in the weekly meetings, especially in the winter season, at each clinic and continued in the homes by the nurses. The organization of the Creche de l'Enfant Jésus might serve as a model.
5. A grant of \$300 for a Goutte de Lait is sufficient to ensure its running for one year.

This means a sum of \$12,000 administration fees, included to be brought before the Infants Budget of 1912.

6. The infants saved will show that this expenditure will constitute a real economy.

Dr. Lachapelle hopes these conclusions may be acted upon without delay, and says that the year 1912 will see the great Pedagogical Exposition which is already exciting the interest of all mothers. 1912 is,

therefore, a fine year for the inauguration in Montreal of a powerful organization against infant mortality.

Advance Notices, Alphabetical.

Canadian Public Health Association 1912 Congress, Toronto, September 18th, 19th and 20th; Charles J. C. O. Hastings, M.D., M.H.O., City Hall, Chairman; T. Aird Murray, M.C.S.C.E., Lumsden Building, and Duncan Anderson, M.D., 28 Wellesley Street, Secretaries, Committee for Local Arrangements; particulars later; Major Lorne Drum, M.D., D.P.H., P.A.M.C., General Secretary, Ottawa.

Child Welfare Exhibition, Montreal, October, 1912. The objects are: I. To present evidence of all the various activities—educational, religious, charitable, philanthropic, and medical making for the improvement of conditions of child life, so that their existence and special work may be advertised, their inter-relationship may be recognized and the public be further stimulated to support and advance their endeavors; II. To show the deficiencies in public and private organizations and to suggest remedies for the same, drawn from the experience of other communities, in this way supplementing and extending the work already being accomplished; III. To correlate the endeavors of many existing associations, developing thereby a body of concerted opinion sufficiently strong and influential to bring about the needed improvements in the surroundings and upbringing of the city child. It is proposed that the Exhibition shall have the following departments: 1. The Health of the Child; 2. The Home of the Child; 3. The Education of the Child; 4. The Moral and Religious Life of the Child; 5. The Recreation of the Child; 6. City Environment and the Child; 7. The Law and the Child; 8. The Social Life of the Child; 9. The Care of the Abnormal Child; 10. Philanthropy and the Child. The Executive Secretaries are: W. H. Atherton, Ph.D., 62 Beaver Hall Hill; Tel., Up 1380; and Rev. J. O. Maurice, L.L.L., 35 Ontario, East; Tel., East 925.

Canadian Association for the Prevention of Tuberculosis, the twelfth Annual Convention will be held in Toronto, May 20 and 21, 1912. George D. Porter, M.B., Secretary.

Canadian Medical Association, Annual Meeting, 1912, Edmonton, Alta. Particulars later. E. W. Archibald, M.D., General Secretary, Montreal.

Ontario Medical Association, 1912, Toronto, May 21st, 22nd and 23rd. Dr. F. Arnold Clarkson, Secretary, Toronto.

See also Advertising Page XXX.

INTERNATIONAL

American Public Health Association.

For the information of new readers who missed our former report, the following officers for the year 1912 were elected at the 39th Annual Meeting of the American Public Health Association, held in Havana,

Cuba, December 4th to 9th, 1911: President, Dr. J. N. Hurty, Indianapolis, Ind.; First Vice-President, Dr. Federico Torralbas, Havana, Cuba; Second Vice-President, Dr. A. J. Douglas, Winnipeg, Canada; Third Vice-President, Dr. Carlos M.

Garcia, Vera Cruz, Mexico; Secretary, Dr. William C. Woodward, Washington, D.C.; Treasurer, Dr. Frank W. Wright, New Haven, Conn.

The place of meeting for 1912 will be Washington, D.C.

The President and Secretary, *ex-officio*. Dr. R. M. Simpson, Dr. W. R. Batt, Dr. H. D. Holton, Dr. P. H. Bryce, Dr. G. T. Swarts, constitute the Committee of Seven for 1912.

The Executive Committee made the following changes in the Committee on Journal for the year 1912: Dr. Henry D. Holton, for unexpired term (one year) of Dr. H. W. Hill (resigned) Dr. Peter H. Bryce, (3 years) in place of Dr. E. C. Levy (term expired). The membership of the new Committee on Journal now stands as follows: The President and Secretary, *ex-officio*, and Dr. P. H. Bryce, Dr. G. T. Swarts, Dr. H. D. Holton.

Mr. B. R. Rickards, whose term as managing editor of the Journal of the American Public Health Association expired with the January issue, withdrew his name unconditionally from further consideration for the position. The Committee on Journal, acting under instructions from the Executive Committee, has arranged to combine, therefore, the offices of Managing Editor and Secretary, and to open an office for the transaction of the business of the Association, similar to that of the Toronto office of the Canadian Public Health Association. Professor Selsker M. Gunn, of the Massachusetts Institute of Technology, has assumed these positions. A considerable saving in the expenses of carrying on the work of the Association will undoubtedly be effected by this consolidation.

Discussion on "Municipal Diseases" at the American Climatological Association Meeting.

Whether country life is more healthy than city life is no longer an open question. Medical investigators are now agreed that the conditions prevailing in cities are directly responsible for many diseases which the dweller in the country is less apt to contract. Dust, smoke and noise are the three principal causes of such diseases,

which are now referred to as municipal diseases.

Dr. Howard S. Anders, of Philadelphia, recently declared before the American Climatological Association that these three features of city life are responsible for a large proportion of human ailments. Of these dust is perhaps the worst offender.

"Country dust," he said, "is composed principally of ground-up rock and is a comparatively clean dirt, irritating, but comparatively innocuous. Municipal dust, on the other hand, represents the accumulation of debris of various kinds, animal and vegetable, such as dried sputum, dead and disintegrated insects, scattered garbage and house sweepings, loaded vehicle losses, smoke and soot—in short, mainly an organic combination which in warm, wet weather is seething with rotteness and in dry weather is mostly blown into our houses, noses and clothing by gusty winds.

"Such dust is not only an irritant to the eyes, nose and throat, but a serious carrier of infection by inhalation and swallowing. Most of the communicable diseases of the respiratory tract are thus produced and transmitted.

"Dust-borne diseases include tuberculosis, pneumonia, influenza, catarrh, rheumatism, tonsilitis and affections of the skin. Dust particles are responsible, too, for fogs. Most of the so-called 'colds' are dust infections gotten in places where people congregate and traffic circulates freely.

"Dust, then, is not by any means a mere nuisance and source of public discomfort, but a menace and direct public danger of deadly potentiality."

Consideration of Laws of Heredity at American Life Insurance Convention.

Do you resemble in your mental and physical attributes your father, or your mother, or some particular grandparent? When you reach a certain age will certain traits that one of your parents developed at that same age become yours? These questions, along with the question of health heredity, were discussed at the last meeting of the medical section of the American Life Insurance Convention. As to health

it was decided that heredity is an important element in longevity, though only a few diseases are inherited. The tendency to disease is, however, often handed down from parents to children. The following ten laws of heredity were acknowledged to be correct:

1. The child tends to inherit every attribute of parents.

2. Contradictory attributes cannot be inherited from both parents.

3. The child may inherit the attributes of either parent solely.

4. It may inherit the qualities of one parent in some respects and of the other in other respects.

5. It may inherit the father's attributes for one period of existence, and of the mother's for another.

6. Some attributes have the quality of prepotency, or the tendency to push aside or overrule other attributes.

7. Attributes which are similar in both parents tend to become prepotent, giving rise to convergent or cumulative heredity.

8. Attributes may be transmitted in latent form from one generation to another, to another in a third or fourth, or still more remote generation—a phenomenon termed reversion.

9. Attributes tend to appear in the progeny about the same time of life in which they became manifest in the parents.

10. Attributes of the father tend to be inherited by the sons, and of the mother by the daughters.

Heredity plays an important if indirect part in many diseases. We do not inherit tuberculosis, for instance, but we do inherit a lessened vitality, or a tendency to contract tuberculous infection. Underweights are usually people who have inherited such a lessened vitality, and they run the further risk of infection from their underweight brothers or sisters who are apt to be infected.

Dr. Luther Sexton declared that of the many elements interfering with longevity of the human race intemperance in drinking is one of the most important. The drunkard is not only exposed to various diseases, but is very apt to get into business or social difficulties that make his life hazardous.

International Office of Public Hygiene.

The conference of representatives of 42 States which was convened last November under the auspices of the International Office of Public Hygiene, and which has been sitting in Paris (France) under the presidency of M. Camille Barrère, the French Ambassador to Rome, has now signed a Convention making regulations for the prevention of pestilential diseases, especially plague, cholera, and yellow fever. This agreement supplements the earlier Paris Convention of 1903 in accordance with the latest scientific requirements.

Advance Notices, Alphabetical.

American Public Health Association Congress, Washington, D.C., summer of 1912—particulars later.

Congress of Hygiene and Demography, Fifteenth, Washington, D.C., September 23rd to 28th, inclusive, 1912. Dr. Joseph W. Schereschowsky, Director. Dr. John S. Fulton, Secretary General.

Congress of School Hygiene, Fourth, Buffalo, N.Y., in the Summer of 1913—particulars later.

International Association of Medical Museums and International Congress of Medicine, Conjoint Meeting. London, England. August 6th to 12th, inclusive, 1913, under the patronage of His Most Gracious Majesty George V., and Presidency of Sir Thomas Barlow. Dr. N. P. Harringham, Hon. General Secretary; Dr. Thursfield and Dr. Woodwark, of St. Bartholomew's Hospital, and Dr. Kettle, of the Cancer Research Hospital, Local Secretaries.

Sanitary Congress of American Countries, Fifteenth, Santiago, Chili, November, 1912. Dr. De Rio, President.

International Congress of Tuberculosis, Rome, April, 1912.

International Red Cross Conference, Washington, D.C., May 7th to 15th, 1912. Address. Dr. C. R. Dickson, Secretary, Canadian Red Cross Association, 192 Bloor St. West, Toronto.

International Eugenic Congress, London, England, July 24th to 30th, 1912. Address the Hon. Secretary, 6 York Buildings, Adelphi, London, England.

International Marine Congress, Philadelphia, July, 1912. This Congress met last year in Brussels, and when the United States authorities extended an invitation to the Congress to meet in Philadelphia, 1912, they, at the same time, invited the Canadian Government to assist in carrying out the honors of the North American Continent. The party will, therefore, be taken over by the Canadian Government at Port Arthur after the Philadelphia meeting, and will go to Montreal, stopping on the way at Owen Sound, Toronto, Kingston, and other lake ports.

League of American Municipalities. The next convention of this league will be held in Buffalo, N.Y., and in 1913 it will likely be held in Winnipeg.

UNITED STATES

Massachusetts State Board of Health.

We have before us a copy of the forty-second annual report of the State Board of Health of Massachusetts, which shows that a vast amount of useful work has been accomplished by that central health authority. In addition to being charged with certain definite administrative functions, the State Board of Health acts in an advisory capacity towards its constituent local authorities, and also towards individuals. Such advice is given at the public expense, and the law requires that it shall be given to the authorities of cities and towns and persons having, or about to have, systems of water supply, drainage, or sewerage, as to the most appropriate source of water supply and the best method of disposing of their drainage or sewage with reference to the existing and future needs of other cities, towns, or persons which may be affected. The very wide use which is made of these powers may be gathered from the fact that during the year 1910 no fewer than a hundred applications in regard to the question of water supply alone were received and dealt with.

Another important duty with which the State Board of Health is charged is that of examining at least once every year all main outlets of sewers and drains in the cities and towns of the Commonwealth, and the effect of sewage disposal. The importance of such a periodical examination can hardly be overestimated. It enables the authorities concerned carefully to note from time to time whether any and what improvements in methods or otherwise are desirable, and acts as an effective check on serious nuisances and possible outbreaks of disease. There are many other matters which come under the authority of the State Board of Health; in fact, the more one examines the record of its work the more is one impressed by its usefulness. A further branch of the work of the Board may perhaps be mentioned—namely, the systematic inspections and investigations which are carried on by a staff of "State Inspectors of Health." The duties of these inspectors are both advisory and executive, but the

most important part of their work is that which relates to the prevention of the spread of diseases dangerous to the public health. To sum up, we may say that the attack on preventable disease may be carried on systematically. The campaign in America, as in Great Britain, is one of the utmost importance and of considerable magnitude; but we are convinced that with the combined skill of the medical officer and of the engineer, and an efficient organization, the great spectre of disease can be effectively laid.

South Dakota and Public Health.

The report of the State Board of Health of South Dakota for 1911 is out and shows fewer fatalities from contagious diseases than in some previous years. Last year there were 45 deaths from scarlet fever, 38 from diphtheria, 15 from measles, a total of 98 deaths from these mild diseases, and one from smallpox. Nothing could better illustrate the truth that these contagious diseases can be controlled, and practically stamped out, and the lives of hundreds of infants saved every year than the smallpox return. The low number of deaths from smallpox arises simply from the fact that the people exercise great care, so reducing the number of cases that the death from smallpox is a simply negligible number, while nearly 100 boys and girls are sacrificed to these milder contagious diseases. The report asks how long it is that people are to continue to immolate the youth of the country upon their criminal carelessness, and asserts that it is time that this matter was taken hold of, and measles, scarlet fever and similar diseases placed in the same category with smallpox and given the same care and regulation, and thus an army of precious youth saved every year.

New York State Board of Health.

The death rate in New York State for 1911 was the lowest ever recorded, while the number of births and marriages increased substantially, according to the annual report of Dr. Eugene H. Porter, State Commissioner of Health. There

were 2,092 less deaths reported throughout the State during 1911 than during 1910. The births exceeded the deaths by 75,288, the total registration in the State being 220,825 births and 145,537 deaths. Returns from marriages indicate that that there were about 90,000 or 5,000 more than the previous year.

Epidemic influenza has been a large factor in the death rate, especially during the winter and spring months. The winter mortality has been higher than the summer; there were 38,600 deaths in the last winter months, and 34,200 in the three summer months.

Pneumonia and acute respiratory diseases caused some 20,000. Pulmonary tuberculosis caused 14,179 deaths last year, nearly the same as in 1910. For the entire period of the last 25 years eleven per cent. of the deaths have been from consumption.

Cancer has reached a mortality of 8,000 and deaths from this disease are increasing rapidly. There were 3,000 deaths in 1891 as against 8,000 this past year, and comparing cancer with the almost stationary mortality of consumption, it would appear that within the next twenty years there would be more deaths from cancer than from consumption. The lowest death rate ever recorded from typhoid fever was shown this year—fourteen per 100,000 population, a total of 1,310 deaths. Measles, scarlet fever and diphtheria each show a saving of several hundred lives.

Smallpox caused three deaths and has been widely distributed throughout the state, particularly in the southern tier. There were 388 deaths from cerebrospinal meningitis; 52 deaths from infantile paralysis; 91 from tetanus; 12 from rabies; 2 from anthrax, and 3 from pelagra.

There was a great saving during the past year in infant mortality. About 1,000 more deaths from accident and 42 less deaths from suicide, than in 1910, are recorded. The principal causes of violent deaths were: Railroad accidents and injuries, 1,683; drowning, 1,037; burns, 950; heat and sunstroke, 738; injuries at birth, 667; inhalation of poisonous gases, 442; poisons, 277; homicide, 448; the total deaths from suicide were 1,437.

The Sanitary Lesson of the United States to Guayaquil.

A small but significant cable from Guayaquil, in Ecuador, South America, last month, emphasized in concrete form the powerful influence that is being exerted by mutuality of interest to bring the nations together for the common good, to diminish distance, ignore political and geographical barriers, as well as divergencies in traditions, creed and institutions—where a democratic aim is the motive power.

It seems a United States officer died of yellow fever contracted at Guayaquil, at which port his gunboat was stationed to protect American interests, due to the perennial revolution then under way in that region. Forthwith, so the cable ran, Washington served notice on the government of Ecuador that unless the infected port were immediately cleaned up a quarantine would be instituted against it. The step was considered essential for the especial protection of the isthmus of Panama, in itself a monument to efficiency in sanitation and reclamation.

To-day the nations unite and battle against disease as never in history. It may accurately be said that the call for a crusade for cleanliness, for physical well-being, for mental efficiency and moral integrity has been sounded round the world. There are still many plague spots in civilization, still much to be learned regarding cholera and other diseases that decimate China, India, Africa and other countries out of the beaten track of enlightenment.

Wisconsin Women and Public Health.

The Public Health Committee of the Wisconsin Federation of Women's Clubs is conducting a very active campaign to better sanitary conditions in each district of the state. Mrs. B. M. Caples is chairman of the committee and is assisted by Mrs. W. J. Shunway, Mrs. O. E. Byington, Mrs. L. A. Bishop, and Dr. Bertha V. Thompson. Its recommendations for this year are as follows:

The Public Health Committee of the Wisconsin Federation of Women's Clubs, first of all, will endorse as a vital national issue the formation of a department of health—where the husbandry of

human life may at least receive the same attention and consideration as the husbandry of live stock, and all that appertains thereto.

The committee also will work for the proper registration of midwives and all women practicing midwifery.

Also the registration of all graduate nurses, after a thorough examination as to their efficiency and capabilities. These qualifications will be a great protection to the public at large, as the nurses unable to pass examinations in states where registration has become an enforced law are establishing themselves in Wisconsin. The registration shall become interchangeable, so that a graduate nurse registered in Wisconsin may practice in New York and other states where the registration law obtains.

The committee also shall work earnestly for the prevention of tuberculosis, endeavoring to reduce through education the appalling figures in the number of fatalities from that disease in Wisconsin each year.

Also matters relating to preventable diseases, especially among children, reducing, if possible, the great infant mortality of the state. The vital questions of sanitation and the proper housing, more particularly in the crowded districts.

In educating the teachers in the ever essential condition of proper ventilation, compelling them to realize that the sickly children placed in out-of-doors schools accomplish more in three hours' time than the child in "shut-in" school rooms does in six hours.

That we endorse medical inspection of schools, proper ventilation of churches, theatres, railway stations and all public buildings, and the sanitary care of all toilet rooms in all public places.

And we also urge vigorously the suppression of all unnecessary noises in cities, towns, and villages.

That comprehensive public lectures be given by physicians upon school hygiene and social hygiene and all kindred subjects.

That the travelling health library of the state be reinforced by all new standard books upon health subjects, and that the committee distribute leaflet literature upon all these vital questions.

Chicago Board of Education and Sex Hygiene.

An enlightened step taken in the policy of the public schools in the United States is that which the Chicago Board of Education recently adopted in planning a course of evening instruction for parents on the subject of sex hygiene.

Under the direction of the Rev. Dean Walter T. Sumner, who has worked out the plan, and two other members, fifty public schools will be opened and physicians and lecturers will give not only simple talks on the subject of sex diseases and their consequences, but also there will be practical suggestions as to home instruction upon the general subject of sex.

Advance Notices, Alphabetical.

Congress of Mothers and Parent Teacher Organizations, St. Louis, March 20th to 26th, 1912.

National Association for the Study and Prevention of Tuberculosis, Eighth Annual Meeting, Washington, D.C., third week of May, 1912. The general organization and the programme will be as follows: Clinical Section, Chairman, Dr. Charles L. Miner, Ashville; Pathological Section, Chairman, Dr. William H. Park, New York; Sociological Section, Chairman, Mr. Frederick L. Hoffman, Newark. The Chairman of the Advisory Council for the annual meeting is Dr. Charles O. Probst, of Columbus, Ohio.

THE EMPIRE AND THE WORLD ABROAD

Infantile Paralysis in England.

Robert Burnet, D. P. H., and Medical Officer of Cornwall, England, presents an epitome of the knowledge, from the English point of view, regarding infantile

paralysis. Dr. Burnet notes that a catarrh of the nasopharynx is frequently observed during the early stages of the disease and the mucus from this region inoculated into monkeys produces the

ailment in them. Inhaled dust sets up a nasopharyngitis. Cases occur for the most part along the main roads and in country villages, large towns in which there is watering of the streets being comparatively free. The disease in its epidemic form appears to have increased with the greater use of the automobile. The epidemic disappears in the rainy season. (This does not agree with the observation of specialists on the American continent.) Cases frequently appear sporadically and not associated with one another, without (apparently) any possible contact. Children in the same bed frequently escape infection from one another. Two cases rarely occur in the same house, and if they do they point to a common source of infection since they are frequently in the same stage at the same time. The disease in England appears to have changed into another age group—the patients showing an average age of six years. This Dr. Burnet suggests is due to the fact that with the growth of motoring the younger children are kept in from the roads more than formerly. He points out that the number of boys affected is double that of girls. On the whole he thinks that these facts point to a dust infection.

Kala-Azar and Its Parasite.

The announcement that Captain W. S. Patton, of the Indian Medical Service, Assistant Director of the King Institute of Preventive Medicine, Madras, has discovered the complete development of the parasite of kala-azar in Indian and European bed bugs has aroused much interest in medical circles and among all interested in scientific discovery. This disease is very deadly in Southern Europe, the Soudan, and tropical Asia, and many efforts have been made during the last five years to find the mode of its transmission, which has now been discovered by Captain Patton. The evidence of this discovery will be awaited with the greatest interest by medical men, and, indeed, by all interested in the welfare of tropical populations.

Kala-azar used to be called "Dumdum" fever, and is still known under that name in some parts of India. It

was long regarded by Indian officials as a peculiarly deadly form of chronic malaria, causing chronic irregular fever, enlargement of the spleen and liver, great wasting, and, in perhaps 99 of every hundred cases, death. It was, and is, endemic in China, India, the Soudan, and probably other tropical regions; in fact, cases have been known in some of the Greek Islands, and even in Sicily. In Assam some years ago it appeared as an epidemic, and spread slowly up the Brahmaputra Valley, killing off practically the whole population in village after village, and receiving the name "kala-azar," or black fever, Sir William Leishman, of the Army Medical School, discovered the parasite of the disease in human tissues, and it was evidently quite unlike the parasite causing malaria. Captain Patton, after experiments with various animals, found that the parasite reached a certain degree of development in the stomach of the bug, which, he suggested, might be the transmitter of the disease; but he also proved that the parasite could be developed to a similar stage in a test tube. Moreover, Dr. Wenyon, of the London School of Tropical Medicine, has shown that similar developments can be reached in the stomach of a mosquito *Stegomyia fasciata*. All that has been certain hitherto is that the disease is probably transmitted by a blood-sucker or dirt-eater, such as a bug, mosquito, tick, flea, louse, or fly.

An American investigator, Dr. Wright, has made the curious discovery that the same parasite, or one almost exactly like it, is responsible for the disease known in various parts as the Sind sore, Delhi boil, Bagdad boil, or bouton d'orient—an ulcer which sometimes reaches a diameter of 3 inches or 4 inches, and lasts five or ten months, but then gradually heals and leaves the patient proof against future attacks.

School Inspection in Japan.

Japanese school hygiene has recently been epitomized in a report in German by Professor M. Mishima, the head of the school medical department at Tokio. It has wide interest, since Japan was in the lead of the other countries in the world in its attention to this subject.

The health of the school children has always had attention paid to it even before the passage of the education laws in 1870. With the coming of physical training into the schools in 1881 there was a proper recognition of the necessity for hygiene and Dr. Mishima was appointed an investigator of school health conditions in 1891. On account of his work a royal commission was appointed which worked through nearly ten years. It is true that personal hygiene becomes a portion of the religious ceremonies so that frequent bathing is the rule, but the application of the principles of cleanliness in a public way is comparatively recent.

Since 1900 medical inspection of all school children has been required annually, the results being transmitted to the central office at Tokio. During the past ten years there has been a noticeable improvement according to Dr. Mishima, in all the scholars over ten years of age. The extent of the supervision is shown by the figures of the little book. In 1909 there were 21,700 schools with about 11,750 physicians and 6,200 scholars of whom thirty-eight per cent. are kept under constant supervision. It is the plan to limit the number of schools to six for any one physician, so that he can visit one each day of the week, and that he shall not be expected to care for more than 1,500 scholars, or, in cases of necessity, 2,000, and thus be able to make the annual inspection in April. A few physicians now run as high as 10,000 scholars each, while 5,600 of them have less than one thousand each.

Sanitation Bureau in Venezuela.

The President of Venezuela has issued a decree creating a National Bureau of Sanitation, in connection with which it is proposed to erect a laboratory of bacteriology and parasitology, a veterinary department, and a central station for disinfection. Imports of preserved foods will be subject to inspection by the Bureau, whose permission must be obtained before the goods are placed upon the market.

Advance Notices, Alphabetical.

Congress of the Universities of the Empire, London, England, July 2nd, 3rd, 4th and 5th, 1912. Fifty-one universities have arranged to send representatives; and among the questions

proposed to be discussed by them are the following: University Organization; Universities in Their Relation to Teachers and Undergraduate Students; Universities in Their Relation to Post-graduate Research Work; Universities in Their Relation to Schools and to Agencies for Higher Education. Other subjects for discussion will probably be: Whether any Common Understanding Will Be Possible Among the Universities of the Empire as to the Extent to Which They Could Recognize Each Others' Entrance Examinations; The Desirability of Increased Facilities for Post-Graduate Study; The Possibility of Some Plan of Interchange of Professors; What Could be Done by Universities in Regard to After Careers of Students, and the whole question of the Financial Support Given from Public Sources to Universities. Inquiries with regard to the Congress should be addressed to Dr. R. D. Roberts, at the Congress Office, University of London, South Kensington, London, England.

Imperial Conference of Teachers' Association, London, England, July 12-16, 1912.

Royal Institute of Public Health.—The Council of the Royal Institute of Public Health have accepted an invitation from the Chief Burgomaster of Berlin to hold their 1912 Congress in that city, from Thursday, July 25th, to Sunday, July 28th, inclusive. A Local General Arrangements Committee has been formed, consisting of representatives of the Royal Ministry of the Interior, the Imperial Board of Health, the City of Berlin, the medical officers of the Headquarters-Staffs of the Army and Navy, the University of Berlin, the medical and hygienic societies of Berlin, and other societies, to promote the success of the meeting. The Congress will be under the presidency of Lord Beauchamp, his Majesty's First Commissioner of Works, and will be conducted in the following sections: State Medicine, President, Sir T. Clifford Allbutt, Regius Professor of Medicine in the University of Cambridge; Bacteriology and Comparative Pathology, President, Professor G. Sims Woodhead, Professor of Pathology in the University of Cambridge; Child Study and School Hygiene, President, Sir James Crichton-Browne, Lord Chancellor's Visitor in Lunacy; Military, Colonial and Naval, President, Major Sir Ronald Ross, Professor of Tropical Medicine in the University of Liverpool; Municipal Engineering, Architecture and Town Planning, President, Mr. P. C. Cowan, Chief Engineer of the Local Government Board, Ireland. Facilities will be afforded for visits to be made to the various public health and educational institutions in Berlin and other places.

Royal Sanitary Institute, Congress and Exhibition, York, England, July 29th to August 3rd, 1912. President, Most Rev. His Grace the Lord Archbishop of York; E. White Wallis, Secretary, 90 Buckingham Palace Rd., London, England.

The Royal Sanitary Institute Henry Saxon Snell Prize.—This prize, consisting of 50 guineas and the silver medal of the Royal Sanitary Institute is offered, 1912, for an essay on "Suggestions for Improvements in the Ventilating, Lighting, Heating and Water Supply Appliances for an Operating Room and Its Accessory Rooms of 400 Beds" (No Students). For conditions of the competition application should be made to the Secretary of the Royal Sanitary Institute, 90 Buckingham Road, London, S.W., England.