

The
Public Health Journal

INCORPORATING THE THERAPEUTIST AND SANITARY ENGINEER

Vol. II

43 Victoria St.,
 TORONTO, CANADA

No. 1

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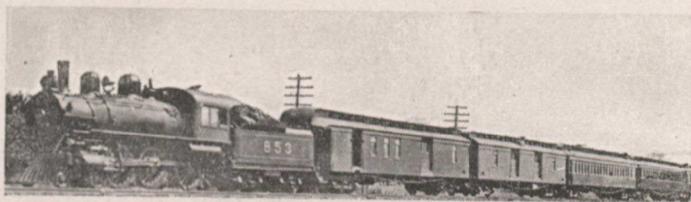
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ORGANIZATION, OBJECT AND MEMBERSHIP

(EXTRACT FROM CONSTITUTION)

ARTICLE 1. Section 1.

This Association shall be called the "Canadian Public Health Association."

Section 2.

It shall consist of the General Association for the conduct of the business and the promotion of the general objects and policies of the Association; and of Sections, when sanctioned by the General Association, devoted to special departments of public health.

Section 3.

The administration of the General Association shall devolve upon the Officers and Executive Council.

Section 4.

The administration of each Section shall devolve upon both active and associate members, and upon special committees of the same.

ARTICLE 2, Section 1.

The object of the Canadian Public Health Association is the development and diffusion of the knowledge of sanitation in all its branches and for this purpose it seeks the co-operation of all professions, trades, occupations, public bodies and organizations participating in any way in the promotion or practice of Public Health work

ARTICLE 3. Section 1.

Members of this Association may be either Active or Associate.

Section 4.

Active membership gives the right to hold office. It may be accorded only to those who have been for a period of a least one year practically engaged in technical branches of public hygiene or have been for a period of one year on the executive or technical staffs of federal, provincial or municipal departments dealing with Public Health.

Section 5.

Associate membership gives the right to vote on all questions, but not to hold office, except in a Section. It may be accorded to anyone not eligible for Active membership.

Section 6.

All members both Active and Associate shall receive the transactions and Official Journal of the Association

AN INVITATION

The Officers and Members of the Canadian Public Health Association invite you to join them in membership, to co-operate in their reviews and study of Social Problems and assist in that thoughtful publicity which is essential to progress in all departments of public welfare.

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Dr. GEORGE D. PORTER, Treasurer.

Canadian Public Health Association, 455, Huron St., Toronto, Ontario.

Please submit my name for Active Associate Membership in the Canadian Public Health Association; *dues \$ _____, which will entitle me to the privileges of the Association including subscription to The Public Health Journal.

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The
Public Health Journal

INCORPORATING THE THERAPEUTIST AND SANITARY ENGINEER

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THE PUBLIC HEALTH JOURNAL (Incorporating, The Therapeutist and Sanitary Engineer), *Official Organ of the Canadian Public Health Association and allied bodies*, is published on THE FIRST OF EACH MONTH in the interest of general prophylaxis and social well-being.

TERMS: Membership fee in the Canadian Public Health Association and allied bodies includes subscription to the JOURNAL; to others, Yearly Subscription, \$2.00; Single Copies, 20 cents. POSTAGE is prepaid by the Journal for Subscribers on above terms.

PAYMENTS should be made, by EXPRESS OR POSTAL MONEY ORDER OR CHEQUE MARKED AT PAR, to THE PUBLIC HEALTH JOURNAL, 43 Victoria Street, Toronto, Canada, and not to individuals.

LETTERS will receive prompt consideration in the order of their arrival; those for the Editorial Department should be written only on one side of paper and have included with private addresses the pseudonyms, if desired, over which they may be published.

SPECIAL CONTRIBUTIONS should be illustrated by photographs or drawings and accompanied by postage for return, if not used.

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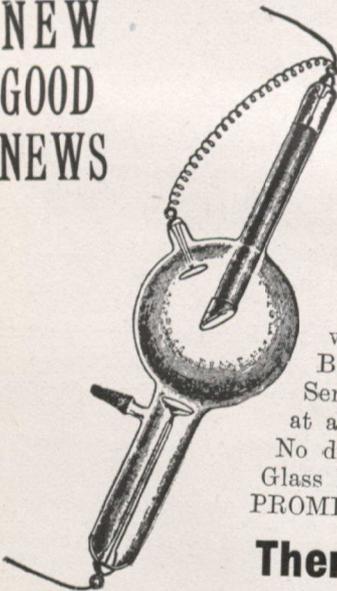
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X Ray and Glass Apparatus Department.

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PROVINCE OF ONTARIO



Board of Health



The Provincial Board of Health of the Province of Ontario will hold a Public Health Exhibit in connection with the Canadian National Fair, held annually in the City of Toronto, beginning about the end of August. In addition to the exhibit there will be daily fifteen-minute lectures with lantern demonstrations upon various subjects relating to Public Health and Prevention of Disease.

Firms desiring to contribute are advised to communicate with the undersigned at the earliest possible date, as space is limited.

JOHN W. S. McCULLOUGH, M.D.,
Chief Health Officer of Ontario,
Parliament Buildings,
Toronto, Canada*



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Department of Education

Official Calendar

January, 1911.

1. New Year's Day [Sunday].
2. By-laws for establishing and withdrawal of union of municipalities for High School purposes to take effect. [1st January].
3. High, Public and Separate Schools open. [3rd day of January].
4. Provincial Normal Schools open [Second term]. [Subject to appointment].

First meeting of Rural School Trustees. [Wednesday following the annual meeting].

Polling day for trustees in Public and Separate Schools. [1st Wednesday in January].

5. Truant Officers' Reports to Department, due. [Not later than 5th of January].

First meeting of Municipal Boards of Education. [Thursday after first Monday in January].

7. Principals of High Schools and Collegiate Institutes to forward list of teachers, etc. [Not later than 7th January].

9. Appointment of High School Trustees by Municipal Councils other than County. [2nd Monday in January].

Annual meeting of Rural Municipal Public Library Associations. [2nd Monday in January].

10. Clerks of Municipalities to be notified by Separate School supporters of their withdrawal. [Before 2nd Wednesday in January].

14. Annual Reports of Boards in cities and towns to Department' due' [Before 15th of January].

Secretaries of Rural School Boards to notify Inspectors and Municipal Clerk of names and post office address of Trustees and Teachers. [Before 15th January].

14. Trustees' Annual Reports to Inspectors, due. [On or before 15th of January].

Annual Reports of Kindergarten attendance, to Department, due. [Not later than 15th January].

Annual Reports of Separate Schools, due. [On or before 15th January].

Annual Reports from High School Boards, to Department, due. [On or before 15th day of January].

18. First Meeting of Public School Boards in cities, towns and incorporated villages. [3rd Wednesday in January].

24. Appointment of High School Trustees by County Councils. [1st Tuesday in January].

February, 1911.

1. Inspectors Annual Reports to Department, due. [On or before 1st February].

First meeting of High School Boards and Union Boards of Education. [1st Wednesday in February].

Rural Board of Trustees may appoint Truant Officer if Township Council neglects to. [Council to appoint before 1st February].

15. Public Library Board to Submit estimate to Municipal Council of several sums required. [On or before 15th February].

Special Tuberculin Offer

The value of Tuberculin as a diagnostic test for tuberculosis is generally recognized. We prepare

TUBERCULIN OINTMENT for the cutaneous test

TUBERCULIN, OLD, in capillary tubes for the von Pirquet Test

TUBERCULIN, OLD, for the subcutaneous test

The consensus of opinion appears to be that:

"The von Pirquet Cutaneous Test is the most suitable method for general use, and is absolutely harmless. It is the only test required for children, because a positive result is more significant of a recent infection and occurs less often in apparent health under the age of twelve. Other methods may be needed in adults to confirm the result of a cutaneous test, but it can be applied as a preliminary method in all cases with advantage."

Journal American Medical Association, January 22, 1910, Folio 261.

Correspondence with many clinicians leads us to believe that for therapeutic use Bacillen Emulsion or Bouillon Filtrate are preferable.

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On receipt of **\$2.00** with name of your druggist we will forward, charges prepaid,

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1 Tuberculin and Bacterial Vaccine Syringe	\$2.00
1 Bottle (8 c.c.) Serial Dilution, No. 1, Bacillen Emulsion Containing 1-10,000 milligram in each 2 minims.	50
1 Package von Pirquet Cutaneous Tuberculin Test (10 tubes Tuberculin, "Old"), 10 tests	1.00
1 Aseptic Tuberculin and Vaccine Scarifier	25
including Working Bulletins on Tuberculins, Bacterins, Typho-Bacterin and Neisser-Bacterin.	\$3.75

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The seeds of knowledge may be
planted in solitude, but must
be cultivated in public.—

Ibid.



J. FLEMING GOODCHILD, M.D., B.Sc., *Chairman*,
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SECTION OF STATE MEDICINE,
ACADEMY OF MEDICINE, TORONTO, ONTARIO.

*Who are strongly advocating changes in State and Municipal Public Health Methods
and Appointments.*

The Public Health Journal

INCORPORATING THE THERAPEUTIST AND SANITARY ENGINEER

VOL. II

JANUARY, 1911

No. 1

Special Articles

PRESENT-DAY CONDITION OF HUMAN TEETH

By W. CECIL TROTTER, B.A., D.D.S.

The condition of the human teeth to-day, the world over, is appalling. Upon analyzing the results obtained from official examinations of school childrens' teeth in various countries, we find that from 90 to 97 per cent. of them have defective teeth. Ailments of the teeth constitute by far the largest percentage of defects among school children. A very comprehensive report just issued by the department of public instruction in New South Wales, upon the physical condition of children attending the public schools, shows from 80 to 90 per cent. with defective teeth, or an average of 4.4 defective teeth per child, whereas only 21.7 per cent. were otherwise physically defective; 57 per cent. had defective vision, 49 per cent. had nasal growths and 24 per cent. were afflicted with throat trouble. Many of these other defects really originated with the diseased conditions of the teeth, and consequent inability on the part of the child to properly masticate and

insalivate the food thereby inducing nutritional disturbances of greater or less magnitude. When one considers what an ideal culture medium the cavities of decay in the teeth afford for the development and propagation of myriads of bacteria, malignant or otherwise, one is not surprised at functional disturbances of many organs of the body following closely upon caries of the teeth.

Many of these carious teeth through the death and decomposition of their pulps or nerves are constantly though unconsciously discharging this infected putrifying material into the mouth, and hence infect the whole system by way of the alimentary canal. What is the use in being as particular about feeding the child pure food and pure milk only to be infected as soon as it enters the portals of the alimentary canal with germs in many cases more virulent than those that ordinarily infect impure milk. So the toothache which the child suffers from is

really the least of the evils arising from decay of the teeth, and only serves as a danger signal or warning as to what will follow. It is the lowering of the general vitality of the body by the constant swallowing of half masticated and unsalivated food which puts the child with decayed teeth at such a disadvantage in the struggle for existence. German staticians prove that the children with defective teeth are intellectually inferior to those with healthy mouths, and loose much more time in their studies than what is required to keep their teeth in thorough repair. Therefore the German Government has adopted a regular system of inspection for school children's teeth, and in many centres has provided free dental hospitals for looking after the teeth of all those who cannot afford the services of a practicing dentist. Germany and the European countries in general have been much ahead of us on this side of the Atlantic in looking after the teeth of their children. We are only just awakening to the urgent necessity for adopting these protective measures. Diseased conditions of the mouth and teeth, are almost universal among modern civilized nations.

Examination of 4,259 pupils in the Halifax schools showed 970 with irregularities; 316 mouth breathers; 244 with fractured teeth; 103 with abscesses; 1,000 or more with teeth coated with calculus or tartar. Only 943 had tooth brushes, 423 had lost all of their first permanent molars, the most important tooth in the alveolar arch, 97% per cent. had defective teeth, one way or another.

Out of 1,400 pupils examined in New York City, 74 per cent. suffered from defective teeth, 19 per cent from defective eyes; 47 per cent from diseased glands; 27 per cent. from nasal trouble and 29 per cent. from throat trouble.

In Toronto a careful examination of the teeth of the pupils in the Elizabeth St. School and in the Church St. School shows the following appalling conditions:—

No. of Children Examined	Elizabeth St. P.C.	Church St. P.C.	Total 866 Av. P.C.
Physical condition not good	48	22	35
Mouth breathers	38	17	27
Unable to masticate	51	20	35
Enlarged glands	47	8	27

	Elizabeth St. 365 P.C.	Church St. 471 P.C.	Total 866 Av. P.C.
Mouths not considered clean	90	56	73
No. of defective teeth per child	6½	5½	5½
No. of teeth unnecessarily lost per child	1½	1½	1½
Abscesses	55	20	37½
Pus exuding into mouth	41	16	28
Pain	43	22	33
No. of children needing treatment	99	92½	95

Notice the close relationship between the figures representing the physical condition, lack of mastication, abscesses and pain, their general interdependence and correlation.

Subjoined is a table showing the conditions found among the various races of the globe as far as obtainable.

Country State or Nationality	Examiner	Number Examined	% Defective Teeth
Germany	Odenthal in 1877	987	72
England	Pedley in 1893 Ass. of Dentists	3,145	77.5
Prussia	in 1900	19,725	95
Copenhagen	Dr. Ralewski	10,000	97
People's School at Reydt	5,300	96.63
Girls' Gymnasium, Moscow	Dr. Gawrowsky	90.97
Andover, Mass.	Supt Johnson	497	96.9
New York	Ass. of Dentists	14,000	74
New South Wales	Ass. of Dentists	7,648	85
Nova Scotia	Dental Ass.	4,258	97½
Toronto	" "	866	95
Esquimos	Estimated		2.5
Indians	Estimated		3-10
Malays	Estimated		3-20
Chinese	Estimated		40

The report of the International Dental Congress at Copenhagen in 1895 gives 80—98.5 per cent. as the average number with defective teeth in all civilized countries of the world.

Examinations of the skulls of ancient races show a much more perfect condition of the teeth than what is found among civilized people to-day. The question naturally arises, why this inferiority in tooth tissue among civilized nations in comparison with savage and ancient races. Apparently changed conditions of feeding are largely responsible for this retrograde movement of civilization. Instead of the raw uncooked vegetable and animal diet of uncivilized people requiring a vigorous and prolonged process of mastication we adopt a diet consisting mainly of soft pappy preparations, which require no effort at mastication, but which can be rapidly swallowed en-masse. Lack of use has evidently been the greatest factor in the degeneration of tooth structure and contraction of the jaws.

There is little doubt but that a few generations of careful and systematic supervision of the teeth of children and adults to-

gether with the adoption of a more rational form of diet, would show greatly reduced figures in the above statistics.

THE STATE MEDICINE FACTOR OF THE TORONTO ACADEMY OF MEDICINE

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During the last year and also in the previous two years, when Dr. Amyot was chairman of the Public Health section, may I mention that the Academy's public health section was feebly supported, not only by the Fellows generally, but by those more interested in this kind of work as the leading preventive medicine specialists of Toronto.

Though re-election to the chair of this branch of the Academy for the present year gave me very great pleasure, I rather felt that as I am not engaged directly in Public Health work it would be better for the section to have as chairman some one more fortunate in this respect. With the view, therefore of benefiting the Academy I sent in my resignation to the Council.

The President, Dr. Albert Macdonald and members of the Council, however, so kindly asked me to reconsider the matter and so generously offered their co-operation and support for the good of the section that I have the pleasure to be with you for one more year.

Let us at this opening meeting make a plea for the continuance of this section—let us try to point out that it is important and necessary to the usefulness of the Academy that this State Medicine Department should be kept alive.

I shall endeavor to do this by reminding the Fellows of past achievements in sanitary reform, by reminding them that medical men have been, and are still, interested in the work and problems of hygiene and by directing our attention to the vast field of

work in this line waiting for the workers.

Physicians have always shared in, and more often than any other class of workers have been responsible entirely for the state and preventive medicine achievements of the past and now as it is chiefly to the medical profession that the people look for the hygienists of the future it is surely important that our Academy—representing as it does the entire field of medicine—should have a section as this in which the special preventive measures shall be studied and discussed.

It is well known to most of us that there are doubts in the minds of some of our Fellows as to whether it is worth while continuing to support and keep in existence this special factor of the Academy. The consensus of opinion has seemed almost to be that we may as well dispense with it.

Why so? Is it not a fact that the very foundations in which have been builded the great hygiene successes of to-day have been laid in the struggles, the work and triumphs of medical men! Such for example as the physician's discoveries in bacteriology and immunity, in the knowledge he has disseminated in regard to water bourne, milk bourne, animal and insect bourne disease, or in the facts he has brought to the notice of municipalities, as the exhaustive proof worked out by Dr. Farr, showing the direct relation of density of population and mortality, the direct relation of density of population to the incidence of infectious and other diseases. Such and many other lines of research have

done much in deducing the fundamental laws of sanitation on which have been built the great and useful work of sanitarians generally.

Without going farther it is enough to announce the fact that the chief health authorities of to-day in the great cities of the world and generally in all stations and places of importance where the health of citizens or armies must be guarded, are State Medicine specialists, members of our profession. I would say this itself is sufficient reason why our Academy should maintain a special health department.

Before going more deeply into our plea I would like to say at the outset, not only for myself, that for every scientific physician present, that we are neither pessimistic nor optimistic on the subject of preventive medicine, but feel rather that this special line of medical work is to-day a factor of no less importance and value to the individual and to the state than is any other in the wide range of medicine or her allied arts and sciences.

Though almost the entire community has shared with ourselves as physicians in the reform and improvement in sanitation still this is a line of achievement in which the medical has taken the lion's share, especially in preaching and urging; and more recently as to the general supervision and carrying out.

Public sanitation is a development chiefly of the latter half of the nineteenth century, though not entirely so. For example many works such as systems of sewerage, public water supplies and municipal baths, were carried to a high degree of perfection in the days of ancient Greece and Italy, particularly the latter.

When our predecessors started in to reform and improve the terribly insanitary conditions which once prevailed in cities there were more serious and difficult problems to face and solve, probably than any we now have to deal with, at any rate, to deal with in matters of sanitation.

In no way can I illustrate the forever unsatisfactory condition of cities generally better than by taking one city as an example and reporting shortly its sanitary condition some forty-two years ago. What has municipal sanitation done for the now beautiful healthy city of Edinburgh,

which maintains one of the lowest death rates of any city in the world to-day, as low at times as thirteen per thousand per annum of its population?

We answer the question by stating facts and figures, which show that Edinburgh has been transformed in these recent years from a city containing slums, hitherto worse than any in America or Europe into its present modern healthy sanitary condition.

Let us go briefly into the condition as to sanitation in Edinburgh as it actually existed in 1868, forty-two years ago. The following facts are vouched for in the report of the Edinburgh Health Officers of that time, Drs. Littlejohn and Alexander Wood, and by the Rev. R. Maguire, who was Rector of St. James, Clerkenwell. They said: "More dirt degradation, over-crowding and consequent shamelessness and unutterable wretchedness exist in Edinburgh than in any town of twice its size or in any area of similar extent to be found in the worst parts of London, Paris or New York. Here in old Edinburgh there was a loathsome infectious sore occupying a very large area of the town. The conditions were such that the inhabitants of several tenements, each tenement having a population of 250 to 300 people depended for their water supply entirely on one well in High street, opposite John Knox's house. From early morning until late at night there was a throng of people about the well waiting their turn for water. Children carried buckets to this well and often had to wait one to five hours to get their supply of water. Old people and others had to carry this water for daily use up as many as 150 steps to their homes in the tenement houses. It was a pitiful sight in the street and followed into the homes we saw how this lack of water helped to degrade. We went into thirty-seven houses that day," etc., etc.

Reading in the report we find many paragraphs similar to the one or two I now quote: "In a wretched den on the 7th storey with no direct light, a family consisting of father, mother and child, of three years were living. On the floor on a straw bed the husband was lying, having been ill with typhoid fever for six weeks. He was murmuring incessantly 'drink' 'drink.' The little child was crippled and

mentally deficient and kept crawling in the ashes. On a line across the room a half washed sheet was hanging steaming. The atmosphere in the room was poisonous. The mother was not able to carry up enough water for cooking and drinking purposes, let alone bring the supply necessary to ensure cleanliness. On our expressing sympathy she burst into tears, sobbing out "O God only knows, slaving after this water is killing me and him too, and in the glen where we came from the bonny burn ran by the door."

In this old town the population of a village was often crammed into the six or seven stories of one tenement house. In these places there was no gas, no water pipes, no water closets, sinks nor even temporary receptacles for ashes and the rooms were catered only by one long dark stone stair, used by upwards of two or three hundred inhabitants.

"Very many of these homes were unwarmed, without ventilation, without privacy, and often without direct light. In this old Edinburgh some 13,209 families lived in houses of but one room, and of these single rooms 1,530 were inhabited by from six to fifteen persons each. Many of the shelters had no windows at all and 900 of them were cellars nearly all dark and more or less damp. These figures give the result that the families living in one room and herding together in closer proximity than animals comprised 66,000 persons. In these tenements the slop pails containing the unwholesome accumulations of the day were kept under the bed, if there was a bed, and failing that in any corner of the room. The absence of means to dispose of refuse was utterly disgusting and injurious to health and inflicted sore toil on the women who were already burdened with drawing water from the wells."

It would be interesting to read further from this report, showing the sad conditions under which these families lived, but what has been mentioned of it is sufficient for our purpose and will serve to bring home to us the fact that an absence of plenty of pure water within the home, together with bad housing and overcrowding was the chief cause of this unhealthy state of affairs so general in the large cities of Europe and to a lesser extent in America at that time.

By the adoption of modern sanitary measures and as far as possible getting rid of the great slum tenements and other uninhabitable houses, the death rate in Edinburgh has fallen from nearly fifty per thousand at this time to the present low rate of seventeen, to fifteen and I believe occasionally as low as thirteen per thousand and per annum. And we see that this wonderful sanitary achievement has taken place in very considerably less than half a century.

Not only has the provision of pure water easy of access in every home done much for the sanitary improvement of cities, reducing the death rate and lessening illness generally, but more particularly we see its salutary effects in the wonderful change in the incidence and death rate of such diseases as typhoid and cholera. In the midlands of England, where typhoid was once so rife, owing to provision of pure water this disease is now a thing of the past; there being but few cases occurring in whole counties, few cases among millions of people.

One of the chief causes of water pollution is the discharge of sewage into it. It is but a question of time until every water supply on the North American continent containing sewage in any degree will be considered unfit for use. Already the purification of water by slow sand filtration has done admirable service in lowering the death rate from typhoid in almost every city where the polluted water has received such treatment. With a pure water supply the death rate from typhoid remains at about eight or ten per 100,000 of the people, and these few deaths are mostly due to cases coming from outside, to infection from case to case in other ways as by flies, careless nursing and infection of milk and other foods.

The filtration plant established at Albany, and similar to the one building in Toronto, removes 99.27 1-0 of all organisms from the water and has reduced the death rate from typhoid so markedly in that city that Dr. Henry Harm reports: "The filtration of our drinking water has practically abolished typhoid in Albany. We have but few cases now and these mostly imported. It is difficult to secure sufficient cases to show the students and it has made a de-

cided difference in the physicians' incomes."

If Toronto cares to go to the additional expense of chemically cleaning the filtered water with chlorine as at present, the entire water supply of the city will be kept practically sterile.

It is of interest also to shortly review the smallpox problem and to notice how happily and successfully this former scourge has been dealt with by our predecessors. Bernoulli, the famous mathematician calculated that not fewer than fifteen millions of human beings in the last century died of smallpox, every twenty-five years and Sussmilch, an eminent statistician of the time of Frederick I., estimated that nearly every one had smallpox and that it carried away a twelfth part of mankind. From 1728-1764 of every one thousand children born alive one hundred and sixty-one died of smallpox, a higher death rate among children than we now have from all causes in healthy localities. Now we have but few deaths from smallpox. The great diminution in the smallpox mortality occurred, of course, after the introduction vaccination. Here we have a perfectly wonderful achievement in preventive medicine and probably the surest indicator of the splendid results we may look to achieve from the application of modern vaccine methods in the cure and prevention of other forms of disease; and indeed we all know very well the excellent results now obtained by the use of sera and vaccines.

Now that the value of preventive medicine in the state and municipality is becoming so well known and understood the need for municipal health specialists becomes more and more imperative and especially so as the municipal activities increase in number and complexity. Mayors in Germany, city clerks in England, city engineers in all countries and special commissioners in many cities are now distinct professional classes and are stimulated in their work by the prospect of advancement to more important cities as their abilities increase. The same is now becoming true of medical officers of health, except probably in North and South American countries. Sanitary or health officers cannot now receive nor hold appointments as directors of health in Britain, in towns of any size, unless they are specially trained for the work. In Can-

adian provinces, special training is as yet of no assistance to any applicant wishing to engage in health work and no such training, so far as I am aware is demanded as a qualification of health officers anywhere in Canada. This fact itself is almost a sufficient reason why the Academy's State Medicine Section should receive our support if only that its members should remain to do duty to urge and impress upon the Government this first necessity and thus in time bring about an efficient health service in the land.

Now that there is a near approach to a general agreement on the scope of municipal ownership, it is not outside our domain in this paper to say that this membership may rightly embrace all those services which are primarily or largely of a sanitary character like water supply, milk, supply, sewage disposal, street cleaning, disposal of garbage, slaughter houses, infectious disease hospitals, sanitary laundries and disinfecting stations, certain markets, public wash houses and baths as well as street closets and urinals; and probably all will agree that these services should be supervised at least by the chief sanitary officer.

The death rate from tuberculosis on our continent is slowly becoming reduced, but surely it is as yet a terrible scourge when in United States alone 175,000 persons die annually from this cause.

In regard to such diseases as scarlet fever the fatality has become so much lessened within the last fifty years that it is impossible to say to what extent the death rate has been lowered by isolation of cases. In the year 1907, the number of fatal cases as a result of this in Toronto was one, one death for the entire city, and yet a large number of patients had suffered from this fever that year.

Curiously enough the death rate from diphtheria has been on the increase during the last half century; until recently by the use of antitoxin this death rate is going down again.

By the application of preventive methods such fevers as malaria, yellow and other tropical fevers and parasitic diseases are readily stamped out.

Summing up the results of sanitation in

England and Wales, the Registrar-General of England computing from vital statistics there says: "There are now half a million cases of serious disease and ninety two thousand deaths per annum prevented in that territory already, as a result of improved sanitation."

Here in Toronto this Academy by the aid of its more progressive public health members has been of some assistance to our municipality in its effort to deal with the water problem, and of not a little value to the families of this community is the work and results obtained by the Academy's milk commission.

The problem of Medical Inspection of schools in Toronto has been attacked and though not yet solved we have every hope that before long it will be. In this connection I would like to say that we should not dispise altogether such simple measures as can be put in force by the principals and teachers in the schools. For example in the district of lower Sackville street, some years ago, when very few of the houses in the neighborhood had baths, and where the school children were in an exceptionally dirty and diseased state, great improvement was effected when the school adopted and enforced certain rules. At an examination one hundred and sixty-one cases of skin disease and vermin were found among the scholars. When Dr. Sheard discovered this wretched condition of health and absence of cleanliness, he ordered that every child take a bath once a week, the principal or assistants to examine the children to see that this was done. Individually the pupils were examined every Monday morning, and if any child were dirty he was sent home to be cleaned. The teacher gave a casual look, and if suspicious two teachers took the child into a room by himself and examined him more carefully. In a short time this school became one of the healthiest in Toronto. The children keep themselves clean at some disadvantage, however, washing and bathing in houses where there are no conveniences for the purpose.

Our recently opened municipal bathhouse is a boon to some of the children, but of much more value would be the establishment of baths in every school. One boy at the Sackville school wrote an essay on "What he would do if he were a trustee."

He said: "If I were a trustee I would put a bath in the school so that the pupils could wash all their bodies at once and not have to do it in sections."

Means to prevent the common everyday cold which is so troublesome in our north temperate climates and especially among the children, is a subject worthy of our attention.

Some time ago the Hygiene Association O. E. A., made an investigation into the causes of absence in Toronto schools and found 38,305 days absence from school in one month among some 12,000 of the children. In this month 24,725 of the days of absence were caused by illness, and it was found that of the many different forms of illness accounting for the total number of days, "colds" took first place; 10,049 days absence being due to this special affection. Upwards, therefore, of one half the entire time of absence from school caused by illness is due to "colds."

Here then is a subject worthy our attention. A simple illness which in most cases could be prevented and yet one that is causing very serious loss of time and an interference with the vitality of our children.

There are many many more important matters and problems in preventive medicine in need of speedy solution, such as our high infantile mortality, the high incidence and death rate from venereal disease, and in the words of our President, Dr. A. A. Macdonald: "Let it be remembered as we try to solve this problem that the baneful influences of promiscuous intercourse and foul disease does not stop with the healing of the local sore."

Gentlemen, we have as earnestly in need of solution the cancer problem, the prevention of the vast increase in neurasthenia and mental derangements—the latter especially—a disease in the community bringing so much of sadness and expense to our people and nation, and yet in a vast number of instances, preventable.

Let me conclude by saying there is probably no department of medicine where solution in recent years has been more rapid than in that of preventive; and in the light of our knowledge of the very often limited value of drugs and other treatments in the cure of established disease it is surely the

duty of each Fellow of this Academy to do his share, even more diligently than in the past, in the work of helping along in the struggle that is bound to effect such greatly needed health reforms, such valuable achievements for the benefit of mankind.

Here then is a great field in which we may work and do much good, and as our work can be best carried out where it can be focused as in this special health organization of our Medical Society I would appeal to the fellows to stand by this department and keep it alive in our Academy.

There are now in this Academy six factors or sections, and these divisions have been made in order that the fellows shall have opportunity in these special departments to devote undivided attention to the special lines of medical science in which they may be engaged or more particularly

interested, it being found that these sections with their own officers and interested members can deal more quickly and effectively with the special subjects than is possible at one general meeting of the society. By this means more is accomplished for the general good of the Academy, for its fellows and indeed for the general advancement of medicine.

We are here to-day members of the State Medicine Section and let us now clearly, see and realize the importance and necessity to this Academy of so useful a division as our own. And now I would make bold to state that if our members will remain to do duty and to stand by this department it will be found in the not very distant future that this now feeble section will surely become the strongest and most powerful factor in the life of the Toronto Academy of Medicine.

THE GREAT WAR

By HALL CAINE

Medical science makes no half measures now. Consumption is curable, it says, and in saying that it deals a death blow to the old theory of heredity.

I remember that in my youth we used to think consumption ran in families. We looked with dread at the closed doors of the farmhouse in which the pestilence had once appeared, and thought of the family within as of people living under an hereditary doom. The Angel of Death had passed their way and made his mark on their doorpost. "It's John now; it will be Jane next," we used to say, and the sense of hopeless subjection to a kind of curse so seized upon the sufferers themselves as to shorten the already abbreviated span of their lives.

"It's a fate, I tell thee; they cannot run away from it," people would whisper, as the members of the smitten family died off one after another, until the household was altogether gone, the house utterly empty, and the hearthstone cold. I recall the names of families whereof every member

was thus swept away, except such of them as had gone off to England, to Australia, and to Canada. It never occurred to any of us that it was perhaps the house, and not the family, that was accursed. If we had gone up after the closed doors had been opened for the bringing out of the dead, and put torches to the infected place, we should probably have been doing the best possible service to the family by burning their homestead to the ground. But, instead of doing that, we used to send for the witch-doctor, a venerable imposter, half-deceiving and half self-deceived, who gathered herbs for the afflicted ones by night, and mumbled charms over them during the day.

In better educated and less superstitious communities the same general ideas prevailed. I have met with them all over the world. Scores of times I have encountered them in London, where they still cling to life with a terrible tenacity. It must be five-and-twenty years since a remarkable report, published by the Brompton Hospi-

tal, appeared to prove beyond the possibility of question that consumption was not an inherited disease; yet this fact, so full of hope for humanity, seemed to make no sensible impression upon the public mind. Down to the present hour vast numbers of people are living and dying in the settled conviction that consumption is born in the blood of those who suffer from it; and hence it is quite possible that the tyrannical idea is killing almost as many lives as the plague itself. But what is the truth? The truth is that consumption cannot exist without the tubercle bacillus, that this parasite is nearly always taken into the body after birth, and that there are scarcely a dozen cases on record in which it has been discovered in the new-born babe. Therefore, we may say to anyone who is living under the shadow of death from fear of heredity:

"Do not any longer believe that because your father or your mother died of consumption you must die of consumption also. The worst inheritance you can have from either of your parents is a vulnerable soil on which the parasite of consumption may prey. Look to it, therefore, that you strengthen and not weaken your defences."

Consumption is an infectious disease. We are all liable to it, and the discoveries of modern science seem to prove that everybody over thirty-five years of age appears to have been attacked by it. A short time ago a well-known London, England, physician said something like this to me—I ask his pardon if I am not repeating his words with scientific accuracy:

"I am satisfied that fully half my cases of bronchitis, and even severe cold, with prolonged cough, indicate fresh outbreaks of earlier lung trouble."

Now, this statement, with the further one that post-mortem examinations have discovered tubercular lesions, healed or unhealed, in the bodies of nearly all persons who have died after thirty-five, appears at first sight to denote an alarming fact, but, at second thought, it must be seen to indicate an extremely hopeful one. It shows, apparently, beyond the possibility of question, that consumption is a disease that is not only curable, but has actually been cured in the vast majority of cases.

And that suggests a very interesting in-

quiry. We thought it appalling that one-seventh of the deaths of the civilized world were due to consumption, but there is another aspect of that astounding fact. If only one-seventh of those who contract this contagious malady die as the result of it, what of the remaining six-sevenths (or some considerable part of them) who contract the disease and yet die from other causes? Let me try, in my utterly non-scientific way, to explain.

I understand, then, that when consumption is taking hold of the human body a kind of warfare is being waged within. The battle is between the invading micro-organisms, the germs, called the tubercle bacilli, which I have described, and the white cells of the blood. These white cells appear to act the part of the policemen of the body, and their business is to drive off any foreign foe that would subdue and destroy it. Now, the result of the warfare thus set up depends partly, it seems, on the strength of the policemen, but mainly on the quality of the soil on which they have to fight. If the soil is good the policemen prevail and the foe takes flight. But if the soil is bad; if, for example, a man's lungs have been weakened by overwork or even overplay, by worry, by drink, by excess of any kind; if his defensive forces have been run down, and his resistance to disease has been undermined by illness, by insufficient nourishment, by loss of sleep, by lack of pure air; above all, perhaps, if his spirits have been depressed by failure or by bereavement, then a small dose of the enemy (taken into the mouth by the simplest means) may be sufficient to overcome the policemen of the body and enable consumption to establish itself.

Even this is abstract language, more proper to the pen of the scientific writer, and I ask to be allowed to describe the little I know of the assault of the dread disease by a more concrete illustration. I can think, then, of no illustration so appropriate as that of a beleaguered city, and no siege so exactly parallel as the siege of Khartoum.

There, in the Governor's Palace on the Blue Nile, sat the great soul whose immediate business it was to withstand the invasion of the vast hordes of the Mahdi's followers who lay encamped around him on nearly every side. At first the people of the city were strong and hopeful, and

under the direction of their leader they were able to repulse every attack of the enemy. But as the days passed their food became scarce, their bodily strength diminished, and their spirits fell low. Still, they held on and hoped on, for the Governor told them that a great army of their allies was coming to relieve them. But the relief army never came, and after long waiting and watching from the house-top, the heart of the leader himself began to fail. At last, when the power of resistance from within was at its lowest, Nature herself, with that callous indifference to human suffering which she often displays, stepped in to break down the last of the city's defences. The waters of the White Nile washed away the more formidable of the fortifications, and then the whooping hordes of the Mahdi swept over Khartoum like a swarm of hungry locusts, killing first the great soul by whose strength the people had lived, and then destroying everything.

Something of this kind, so far as I can see, takes place in the human body as often as the germ of consumption lays hold of it, and, therefore, I assume it will be safe to say to everyone:

"If you allow your defences to be weakened by any excess whatever, whether by overwork or worry, or sorrow, or even the gaieties of society itself, it will only require a breath of impure air, a mouthful of germ-laden dust, a spoonful of corrupt butter, or a glass of apparently wholesome milk, to enable the worst enemy of the human race to enter your body and lay it low."

But already I hear the natural answer that it is not always within a man's power to resist the influences which go to make his lungs vulnerable, and that the inevitable struggle of life itself is often responsible for the conditions which expose him to consumption. That is only too pitifully true, and I count it among the cruelest aspects of this merciless disease that by its very nature it always hits a man hardest at the moment when he is least able to bear a blow.

The statistics of consumption show that the years of early manhood and early womanhood (about 31) are the period especially marked out for death. Can any fact be more distressing, both in the physical and moral suffering it indicates, and in

the economic loss it denotes? Think of it. At 31 the majority of young women have become mothers, and their removal is laden with tragic loss to the children they leave behind. At the same age the majority of young men have become husbands and fathers, the bread-winners of families, and their deaths are disasters that must be multiplied by the number of lives that have depended upon their lives. And then, beyond the utterly incalculable human loss there is the scarcely calculable national one, for the State has lost prematurely vast numbers of producers of labour, taxpayers and ratepayers, all of them economic assets, and responsible factors in the welfare of their country.

And this brings me to a very grave question. What are the conclusions to which the non-scientific mind must come after examination of the lamentable facts which scientific inquirers have put before him? The first of them appears to be this—that consumption is a disease produced mainly by the conditions of civilized life, that consumption is, in fact, the disease of civilization. Apparently the savage races are entirely exempt from it. The Esquimaux and the Indian and, until lately, the negro races were immune. I can say from my own observation that on the Soudan desert, where the variations of temperature seemed to require that I should dose myself with quinine almost every day, the half-civilized Coudanese, living in their crowded and noisome tents, showed no traces of tuberculosis. But civilization brings with it the necessity for cities, and cities seem to increase their area by force rather than by desire. Hence narrow streets and lofty buildings, which, shutting out the sun, which is the deadliest enemy of the consumptive germ, and increasing the dust, which is one of its strongest allies, become responsible agents in the propagation of the disease. Then the necessities of industrial as well as commercial life become agents no less active, by huddling people together in factories and workshops, by surrounding them with the material which most easily holds contagion, and by employing them in the kinds of work which most speedily lower the bodily strength and reduce the power to resist infection. The larger the city, too, the greater the difficulty of escaping from it, in order to obtain that recuperation which the sailor,

for example, enjoys when he leaps up on deck and breathes the free air of the open sea after four hours' sleep in the stifling fo'c's'le.

So it seems to come to this—that if you are a civilized man, living in a civilized country, your risk of death from consumption is immeasurably greater than if you were a savage living in savagery. It seems to come to this also—that if you are at the age when life is most heavily burdened by anxieties, and you are of most use to your country, you are especially liable to the attacks of this terrible pestilence. But the evil which civilization has created it is the duty of civilization to remove, and in the presence of the appalling statistics of consumption which I have hastily summarized, it is at least the right of every citizen to demand of the State that its subjects shall be better housed and, as far as may be, better fed.

The second of the conclusions which the non-scientific mind is reluctantly compelled to draw from the facts laid before him by scientific inquirers is that consumption is (what Sir William Broadbent called it) "the poor man's disease." The rich man may contract it, and among the most pathetic of my recent experiences is that the ravages of consumption are just as pitiless in their human aspect (if that can be divorced from their economic aspect) when they visit the rich man's house as when they enter the house of the poor. Indeed, they have an element of cruel irony in the one case that is absent from the other. I was once driving in Cumberland past a beautiful house, which sat high on the side of a hill, with trees behind it, and sloping lawns and a blue river in front, and with the sun flooding the place with soft autumn light. It was like a glimpse of the Garden of Eden, and yet I was told that the only child of the family, a young and beautiful girl, had died that day of consumption. Not in all cases can the greatest wealth or the utmost resources of science save the life that is threatened by this appalling plague, but beyond question the perils of infection and the difficulties of cure are enormously increased by the conditions of life which poverty must impose.

For instance, the poor man who lives in the sunless rooms of narrow streets and works in overerowed chambers, perhaps

with work-fellows who are already infected, runs by that circumstance alone a thousand risks to one as compared with the rich man in his pleasant house and garden. Then the poor man's food is neither so good nor so plentiful as that of the rich man, and if he keeps his windows closed from the fresh air which would help to destroy the deadly germs it is partly because he cannot afford fuel for fire, and partly, perhaps, because he knows of long and better experience that cold stimulates the hunger which he cannot appease.

Having taken the contagion, too, the poor man's chances of recovery are immeasurably less than those of the rich man. He cannot go off to the Engadine and bask in the winter sun, with the clear, dry frosty air in his nostrils, or take his yacht and sail leisurely down the Mediterranean, or hire a dahabeah and float lazily down the Nile. He cannot even get out of the city once a week (if he lives there). He cannot afford to rest, which is one way of helping the defensive policemen of the body to expel the hordes of the enemy that are invading it. He must go on with his work as long as he can stand up to it, thereby reducing his chances of recovery and continually infecting the family he cannot afford to leave.

When the crisis comes and he is compelled to go into the infirmary, he does his best to escape from it before his cure is complete, lest his wife and children, who are probably unprovided for, may be compelled to go into the workhouse. And when death overtakes him at length, as it nearly always does, with utterly disproportionate rapidity, he leaves his death-room, laden with the dried particules of his expectoration, to infect other poor people who will follow him in the same place.

The third and last of the conclusions the non-scientific mind is compelled to come to, after examination of the statistics of scientific inquirers, is that consumption is a malady which attacks with its fiercest virulence the finest types of the human race. It would appear natural that this white plague, which is always lying in wait for the vulnerable soil that is peculiarly fitted for its propagation, should assail with especial and relentless force the rare and noble beings whose bodies are constantly being consumed by the splendid activity of their souls. What this

means to the general welfare of the world, which of us can say? Think of the great spirits prematurely lost to life by this accursed pestilence. Keats, Schiller, Chopin, Spinoza, Rachel, and Robert Louis Stevenson are among the victims whose names come without prompting to one's lips. But when I look back to the period of my own early manhood, and count up, within the narrow circle of my own acquaintance, the number of young men and young women, unknown to the public, who have since fallen victims to consumption, I give it as my confident opinion that a large proportion of them were people who must have played a great part in the business of life if they had lived. A physician told me the other day that this was his experience also, and in no other connection can it be more true that whom the gods love die young.

I am quite prepared to hear that what I have said thus far on this subject is main-

ly sentimental in its appeals, and before attempting, when more space is at my disposal, to deal with the economic aspect of consumption, in order to show how great is the mere financial loss that is caused by this disease both to the individual units of the people and to the State as a whole, permit me to conclude with one statement which must certainly come home to all of us.

If it be true that consumption is not an hereditary but an infectious disease; if it be true that consumption is curable; if it be true that the mortality caused by the malady chiefly centres in the age of 31; and if it be also true, as the insurance companies tell us, that the average expectation is thereby curtailed by twenty years, then it follows that the stamping out of tuberculosis alone—and true co-operation in public health matters will do it—would endow everyone of us with longer life.

THE MIRACLE OF DIGESTION

By HERWARD CARRINGTON

When one stops to think of it, there is nothing more marvelous in the world than the process of digestion. It is taking place all the time, too—right inside of us! We eat certain foodstuffs, and they form a living human body—flesh, bones, muscle, nerves, organs. And all of these nerves, muscles and organs are capable of living, moving and acting upon food in turn.

Look, for instance, at that chicken! It walks about, picking up seeds and grains and worms and what not; and all this is transformed into eye and comb, beak and feathers of multiple shades! The fish that swims in the sea lives on its varied food, and, in his case, it is transformed into scales and fins and glassy eyes, which give one the creeps to look at! Yes, it is all very wonderful.

One fact of practical importance must be borne in mind here. It has been said that "digestion begins in the mouth and ends in the lungs." The meaning of this is as follows: After the food has passed into the stomach, and is acted upon by its appropriate digestive juices, and after it

has passed on into the intestine, and is acted upon by other juices there, it is absorbed into the blood stream, and carried to the lungs, there to be mixed with air.

The oxygen of the air combines with the particles of food, and renders them capable of being used by the system. Until this process has been gone through the food can not be used by the body. No matter how much food we eat, if it is not mixed with the oxygen of the air in this fashion the body can not use it. (Hence the great importance of fresh air after eating).

From this fact we draw the following important conclusion: That the more food we eat, the more we should breathe; and the less food we eat, the less need we breathe. If the disproportion between the two be great, and be kept for months and years, grave diseases are bound to follow in consequence.

Until recently it was thought that digestion was a comparatively simple process. The proteids—the muscle-forming foods—were, supposedly, quickly acted upon by the gastric juice of the stomach and ab-

sorbed. The fats and starches went on, and they were acted upon by the various juices and absorbed in turn. It was all very simple! Now, however, it is known that the process is far more complex, and that many changes are passed through before the food is really absorbed by the body, or ready for forming bodily tissue.

Starches can not be absorbed by the body as such. They must first be converted into a sort of "glucose." This can not be done in an acid medium; hence the necessity of chewing all such foods very thoroughly, so that they may be converted in the mouth by means of the saliva. Proteids are largely dissolved by the acid, gastric juice of the stomach. Fats and starches complete their digestion in the bowels. The fats are here made into a sort of soap—an emulsion—and in that condition they are absorbed by the blood, carried to the lungs, and finally grabbed up by the hungry tissue-cells, to make live bodily matter.

Most of the changes that are undergone in the process of digestion are now understood, and it has been found that they are chiefly chemical in character. The changes and reactions are numerous and marvellous, but they can be followed. From the moment when food is put in the mouth until it reaches the bodily cell, as nourishment for it, these changes can be followed and in large measure understood. But when this food material is converted into living matter—when it forms the body—no one can tell what takes place, nor have we the slightest idea of the changes necessitated in bringing this result to pass.

The food seems in some way "vitalized"—as though endowed with life from the living cell, and then that it forms part of it. But the mechanism which brings this to pass can not be comprehended. We are face to face with the problem, "What is life?" We may, in truth, call it "The miracle of digestion."

INSECT CARRIERS

By SIR RAY LANKESTER, K.C.B., F.R.S.

The little insects which we call gnats and mosquitoes are not only responsible through their representative, the Anopheles, or spot-winged gnat, for one of the most widely-spread diseases, viz., malaria, but in addition to this and to the serious irritation set up by their poisonous stabs or "bites" (a result in which microbes have no part, the irritating poison being produced by the gnat itself), they may casually introduce, by mere adherence of blood or dirt to their stabbing organs, other disease-causing microbes to which they are not the necessary and established intermediate hosts.

There is one other kind of gnat besides the Anopheles which is known to be the necessary and special host to a most terrible disease-causing microbe. That gnat is the Stegomyia of the east coast of tropical America, and the disease is the deadly yellow fever, or "Black Jack." The microbe is taken up by the gnat when sucking the blood of yellow fever patients and conveyed to healthy men. But it has to

remain twelve days in the gnat before it can be passed on. It must undergo some changes and multiplication in the body of the Stegomyia gnat, yet—and this is at first sight an astounding fact—it has never been seen! Scientific faith and the evidence of things unseen is here our guide. Experiment has conclusively shown that the "germ" of yellow fever is taken up by the gnat, and is carried by it after a lapse of twelve days, but not earlier. Some day we shall probably see this germ, and ascertain its form and behavior. At present it is not known. Nevertheless, yellow fever has been entirely abolished within the last ten years in many tropical cities by assuming its existence and preventing the gnat from carrying it!

Of the screw-like trypanosomes, which infest the blood of man and animals and frequently cause disease, the commonest is one which is often found in the blood of the common sewer rat. It was discovered thirty years ago by a distinguished young Army surgeon, Dr. Timothy Lewis (who

died before his best work was done), and is called "Trypanosoma Lewisii." A drop of the blood of an infected rat examined under a high power of the microscope shows hundreds of the little screw-like parasites swimming and knocking the red blood-corpuscles about in a most active fashion. This is a case in which there is adjustment between the host and the parasite, for the rat is not injured by the presence of the trypanosome in its blood. After a time the trypanosome dies out, and the rat is none the worse, but has acquired such a condition of the blood that it cannot be re-infected. The rat trypanosome is carried by the rat-flea (the kind called *Ceratophyllus fasciatus*, common on European rats) from infected to uninfected rats. The parasite undergoes during six days elaborate changes and multiplication in the flea. The latter is a true host, not a mere mechanical carrier. It is being carefully studied by Professor Minchin, of the Lister Institute. The louse of the rat also can carry the trypanosome from one rat to another, but less certainly than the flea; and it seems that the rat louse is a mere carrier of this parasite, and that no important development of the trypanosome takes place in it; it is not a true host. Rats are also infested by "mites" or "acari," like the itch insect of man; and it has been shown by a beautiful series of observations that in the United States another microbian blood-parasite, called "*Hæmogregarini muris*," is carried by these mites from one rat to another, and undergoes a special and remarkable sexual process of multiplication in the body of the mite.

Whilst the rat-trypanosome of Lewis is harmless to the rats in whose blood it lives, and whilst there are other trypanosomes, such as those of the frog's blood and of the blood of many fishes, of turtles, and of birds, which are also harmless to their hosts, there are others which are known as the cause of deadly disease. The best known of these is that which is carried by the blood-sucking "tsetse fly," of the fly-belts of South Africa, and is conveyed by these flies from the blood of big, wild game animals (such as buffalo and antelopes), in which it exists without doing any harm, into the domesticated cattle, horses and dogs, which mankind has brought with him into this region. The wild animals are "reservoir hosts," from

which the flies continually spread the infection. In the domesticated introduced animals the trypanosome (which is named "T. Brucei," after its discoverer, Colonel Sir David Bruce) causes a fatal wasting disease called "nagana." It is not yet ascertained what changes this trypanosome Brucei undergoes in the tsetse fly's body, if any. It is certain that the tsetse fly acts very efficiently as a direct carrier, rapidly introducing the parasite from one animal to the next one which it bites, just as one may introduce it by means of a lancet.

Another trypanosome, called *T. Gambiense*, very like the *T. Brucei* but distinct, has been shown to be the cause of the deadly sleeping sickness of the natives of Tropical Africa (200,000 natives recently died of it in five years in Uganda), and it is carried by a similar but distinct kind of tsetse fly. Both the fly and the trypanosome are very close indeed in appearance to those concerned in the nagana disease of horses and cattle, and there is at this moment some fear that the southern tsetse fly may prove to be capable of spreading the sleeping sickness amongst the human inhabitants of Rhodesia and Southern Africa. It has proved very difficult to ascertain what happens to the trypanosome of sleeping sickness when it remains in the body of the fly, because there are often other kinds of trypanosomes present there, and confusion of one with the other is at first unavoidable. It is now certain that the parasite can remain active and capable of infecting a man for many weeks after it has been sucked up by the fly, although immediate transference to a new victim by the fly's bite is possible, if not usual.

These tsetse flies (called by scientific men "*Glossina*") are very awkward customers. They are a little bigger than a house-fly, powerful and rapid fliers. They alight on a man without his feeling it, bite at once, and are off. To escape their deadly attentions one must avoid the shady groves near lakes and streams where alone they are found—and groups of trees must be cut down on this account in the neighborhood of towns and villages in Central Africa. No "reservoir-host" or regular animal-host besides man has been discovered, as yet, for the sleeping sickness trypanosome, though not improbably one exists.

Many other kinds of trypanosome inhabiting the blood of cattle and horses and other large animals are known in Africa (several have recently been described from Central Africa) and other parts of the world, which cause disease. One, called *T. vivax*, is carried by the tsetze-fly in Central Africa, and attaches itself to the inside of the fly's proboscis, where, apparently, it multiplies. It was at first thought to be the sleeping sickness kind, but is not so. It is carried by the fly to the blood of cattle. Another in India and Burma (called *T. Evansii*) is very like Bruce's trypanosome of the fly-belts of Africa. It causes a distinct disease called "surra" in camels, horses, and elephants, but no special fly is known as its carrier. Probably several blood-sucking flies serve it in this way. In South America another is known causing great mortality among horses, but no special fly has been discovered as associated with it. Another in North Africa causes a disease of horses and camels called "dourine."

The view has been put forward by Professor Minchin that these numerous disease-producing trypanosomes, which contrast with the harmless rat trypanosome, are newer varieties—so to speak, "enterprising" races—of previously harmless species which have effected a lodgment in new hosts which are not yet "adjusted" to their presence. The well-adjusted, old-established trypanosome has but one kind of animal as its host, and none of those I have mentioned, even the ill-adjusted disease-producers, excepting the *Trypanosoma Gambiense* of sleeping sickness, can live in man. When the newer disease-causing races or species of trypanosome have killed off the more susceptible individuals among their new hosts, a race of the host-animals must necessarily be produced indifferent to, or tolerant of, the chemical substances produced by the trypanosomes which at present act upon them as deadly poisons. But the making of the immune race takes time and much sacrifice of life.

The clothes-louse of man has been shown experimentally to be the carrier of the microbe of typhus fever (gaol-fever), and the common bed-bug is believed to be the usual carrier of the spiral filamentary bacterium (*Spirillum*) which causes relapsing fever in Eastern Europe. In Africa a microbe causing relapsing fever is car-

ried by a mite or acarus, which inhabits the earth-floor of huts used as human habitations. The mites are peculiar as hosts of disease-causing microbes in that they often (if not invariably), when they have taken in a microbe of the kind, which multiplies inside them, pass it on to their own, as yet unborn, young, so that it is the second generation of the mites which spreads the disease. This has been especially studied and ascertained in the case of minute non-motile pear-shaped parasites (*Piroplasma*) allied to, but not identical with, Trypanosomes. Some of these cause devastating cattle diseases in Africa, and are all the more difficult to check or eradicate owing to their infecting the young of the acarus or mite which first sucks them up from the diseased cattle. The young acari thus infected serve as intermediate hosts, live on the open ground, and become widely dispersed, and eventually attach themselves to healthy cattle and infect them with the minute disease-producing microbes. A not uncommon Indian fever called "Kala Azar," as also the disease known as "Delhi sore," are produced by two kinds of these minute pear-shaped, non-motile microbes, which, when cultivated (and probably when taken into the body of insects), develop a lashing hair or flagellum, and swim with corkscrew-like movement of the body, resembling in this respect a Trypanosome. The carrier and intermediate host of these microbes is believed to be a bug, but not improbably certain sand-flies play that part.

The most interesting discovery of late years in these matters is that of a Trypanosome which is found living and multiplying in the gut of the enormous bug common in country houses in Brazil and other parts of South America. The bug is known by the name *Conorhinus megistus*; it is as large as a stag-beetle, and is marked with red splashes on its black body. A friend of mine came across these unpleasant creatures in a room where he slept up-country in Paraguay. At night he saw on the ceiling what he thought was a decorative design, consisting of oval black patches. In the morning he was suffering from "bites," and saw that each black patch on the ceiling was now swollen (by his own transferred blood) to the shape and size of a large ripe grape. Dr. Chagas has discovered that these gigantic bugs pass the

Trypanosome, which flourishes in their digestive canal, into the blood of the small monkeys (marmosets) and other warm-blooded animals whose blood they suck. And on careful inquiry in districts where they are common, Dr. Chagas found that many of the human natives had this Trypanosome living and multiplying in their blood, having been infected by the bite of the huge bug. The infection causes serious illness, and leads to a kind of idiotcy when it has been established in the blood of children, arresting their proper nutrition and growth. This new Trypanosome is called *Trypanosoma Cruzi* after Oswald Cruz, the founder of a laboratory in Brazil for the study of disease, where some of the best work of the last three years in the investigation of microbe-caused disease has been done.

Knowledge as to the existence of disease-producing microbes and their carriage by hitherto unsuspected bugs, flies, and other insects, is rapidly extending year by year. The last discovery implicates a nasty little blood-sucking two-winged fly, which abounds in damp basements and out-buildings in Italy and the warmer parts of the world. There are several species of the kind—that common in Italy and the Herzegovina—(I remember its unwelcome presence at Naples forty years ago!)—is called “the Pappataci.” Naturalists call it “*Phlebotomus papatasi*.” It is like a

very small gnat, but has a fatter body, and is of a grey colour, and has drab-coloured wings. It has now been shown that this little fly carries to man the microbe of a “three-day fever,” which is like the Dengue fever of India, and is common in the South of Europe. The microbe, having been taken in with blood, appears to have to stay for eight days in the Pappataci before it has so developed as to be capable of being introduced by the fly-bite to other victims. Details as to the history are still to be discovered. The Pappataci flies without any noise, and gets through the meshes of all but the finest mosquito curtains. It makes a very nasty sore place where it bites or stabs so as to suck blood. There are species of it in Africa and India, probably active in carrying disease germs to men and animals. It is allied to the group and sand-flies called “*Simulium*,” some of which abound in these islands and worry salmon-fishers with their biting swarms. It has been suggested that the human disease called Pellagra, in North Italy, is caused by a microbe carried by sand-flies, but no experiments tending to prove this have been published. It used to be thought that Pelagra was due to poisoning by unhealthy maize on which the agricultural population of North Italy feeds, just as, at one time sleeping-sickness was held to be caused by badly-prepared manahoc root, on which African natives feed.



World Views

The City of Health and Comfort.

Eugene Henard, the architect, for the city of Paris, outlines for us what the city of another century must be. Would it not be wise to set these needs before the eyes of our people that we may grow up to them and so escape the burden of making the changes that will be demanded by the business and sanitary needs of the coming day?

We are told that more space must be devoted to grass and trees and fountains—we shall be required to take better care of the public health.

The roofs of the buildings must provide for flowers and plants—recreation will demand that we receive our guests in the open air whenever the weather will permit, and taste will require the presence of flowers and shrubs—such spaces will be enclosed by glass.

Terraces will be provided for aeroplanes.

Light and energy will be furnished by electricity. Petrol and oxygen will provide heat. Liquid air will provide cold to temper the heats of summer and enable each house to keep the desired temperature—why should not our houses be cooled as well as heated?

Each house will have one or more health chambers to which the occupants can retire when fatigued or sick—these will have double doors and windows, permitting the provision of the exact hygienic conditions prescribed.

The physician will keep his patients in health, not depend on the prevalence of disease for his livelihood.

No more will money be wasted on holidays to the mountains or the seashore—all conditions needed can be provided in the house by pressing a button.

The pavements will travel, not the pedestrians—natural forces will do the work without the consumption of human energy.

The streets will be broad and straight—the height of the houses will be exactly the width of the street.

Railway Cars as Carriers of Disease.

Dr. J. Howard Jones, Medical Health Officer of Newport, England, discusses quite at length the railway carriage as a carrier of disease. He notes that a great deal has been said about the carriers of two diseases, those individuals who are factories of typhoid and diphtheria germs and are active in their distribution, but the railway carriage is much more important and demands to be considered. These others distribute one kind of disease, each; the railway carriage is a carrier of all kinds of diseases. "There is always a difficulty in tracing outbreaks of disease to their sources," writes Dr. Jones, "on account of the complexity of modern life and the amount of intercommunication. Railway systems are undoubtedly fruitful means of the transference of infectious diseases from town to town and from one individual to another." He gives many examples, in which cases of measles, scarlet fever and other diseases have been sent from one town to another, apparently with the knowledge of the physician treating the case. In one instance scarlet fever was treated for rash and from the original case four men caught the disease. Two of them travelled by train to a fever hospital in a large town and the other two were taken by motor-car a distance of about one hundred miles. "One is loth to believe," writes this correspondent, "that members of the medical profession can be in the habit of sending patients suffering from infectious disease away without pointing out the dangers of so doing, unless proper precautions are taken. Dr. Jones says he has evidence of a case where rash developed into smallpox and an individual caused sixteen cases in the town to which she went. There were two of the passengers in the same compartment on the train who developed fatal cases and altogether 187 cases and 36 deaths. These examples, the writer points out, are those that have come to his notice in some accidental way and there must be very much greater numbers if all could

be traced. He asks the Royal Sanitary Institute to point out to the railway companies the fact that their rules are frequently broken in this respect, and suggests the desirability of drawing the attention of the companies and the public to the existing condition of affairs and calls for reform in the manner of cleansing the cars.

Helping the Sightless.

In every city, almost a familiar figure on some street corner has been that of a mendicant, a cane in one hand, a tin cup in the other. Sometimes a variation has been found in the unfortunate who saws on a battered and tuneless violin. Always, though, he has worn the insignia of his rank, a card bearing the words, "Help the Blind." And always tender-hearted passers-by have been found ready to drop coins into the little tin cup in order that the sightless one might maintain life in his afflicted body.

This spectacle, fortunately, is one that is rapidly disappearing. It has been found that the truest charity toward this class lies not in showering them with small coins, but rather in aiding them to support themselves in some more desirable fashion. One of the most commendable of philanthropies is that which teaches the blind to help themselves. When one is deprived of one of his faculties others become keener. Because of this rule the blind person's sense of touch is extraordinarily developed and thus permits him to become a skillful craftsman even though he is unable to behold the work of his hands.

Agencies are at work nearly everywhere now teaching the blind the best use for their hands and fingers. But there must be further support and encouragement from the public if the plan is to succeed fully. While the blind produce eminently merchantable articles, the public must learn their desirability and have easy access to the places where the goods can be purchased. Before Christmas a department store in New York devoted space to a display of these products. No charge was made to those who fashioned the articles or to their sponsors, and every cent the articles brought was turned over to the makers. This suggests the thought that department stores might well afford to give

space to such articles at all times, thus adding to their reputation for public spirit and generosity. Salespeople could doubtless be provided from among the blind themselves. The blind would prefer not to be idle, not to be indigent, not to be mendicants. Let them be helped in the most practical way.

The Plague: How It is Spread.

James Scott writes in "The Sanitary Record" (London): If proof were wanted of the amazing fact that minuteness of living forms is synonymous with tremendous power, it could be found in connection with the influence of microbes. For the creation and distribution of evil—and in some directions for good—they are possessed of very mysterious, far-reaching capacities. Among the foremost examples must be classed the plague microbe, named *Bacillus pestis*. This is the germ which is at present occasioning so much anxiety to the Medical and Sanitary Authorities, causing them to institute plans and precautions which, in the judgment of persons who know nothing of the possibilities of the subject, savor more of the action of unreasoning, panic-stricken men than that of sane ones.

But men who are familiar with the performances of these invisible objects know that those who govern municipal affairs should be warmly thanked for their vigorous care, as they are undoubtedly preventing the occurrence of disasters of a very horrible, deadly character, such as that which ravaged this country during 1665—at the time of the Great Plague—and still takes toll in thousands of lives in India. From July, 1909, to June, 1910, there were 141,357 deaths from plague in India.

To look down the compound microscope at some of the microbes of the plague always surprises the uninitiated observer, because, although they may be magnified several thousands of times, they appear to be simply a collection of tiny dots. To reflect, however, on their capabilities is to induce a shudder; for there are enough depicted to devastate a whole town, if they could secure lodgement and multiplication in people's bodies. They would lay its inhabitants prone as corpses within a week.

How strange that normally invisible specks should be able to do more mischief

among mankind than would an army of wild beasts! It makes a man feel absolutely foolish to know that such things can take away his life. If he could strike a microbe with an axe, as he can a venomous reptile, he would not seem quite so helpless. But pestilential microbes—ugh! they are mysteriously abominable.

The idea seems almost too ridiculous to contemplate. They are unconscious things, more like seeds than anything else, and so are entirely devoid of any evil intent; yet nothing could exceed their virulence and destructiveness.

The disease is called bubonic plague because of the buboes, or inflamed glands, so characteristic of its work. It spreads epidemically. It is infectious rather than contagious—an important distinction—and is divided into several varieties according to the organs chiefly attacked. The germs differ slightly in properties, one kind being called *Bacillus pestis fulminaris*. This is fatal within twenty-four hours. Other conditions are less alarming. From five to six days is the period of incubation, or unfelt development of the microbes in the blood. Then their poison breaks out in all its revolting hideousness. The patient is suddenly seized with headache, rigor, chill, giddiness, thirst, vomiting, pains in the back, and limbs, and prostration, accompanied by severe fever, when the temperature may rise to 106 deg. Death generally follows about the tenth or eleventh day; but, if the victim survive this period, complete recovery is very probable.

Inflammation of the lymphatic glands (buboes), are the most noticeable signs of its presence; numerous carbuncles also springing into existence. The membranes of the lungs, kidneys, and other organs, are seriously affected; while frequent bleeding of the nose and lungs is a prominent symptom.

Seventy thousand people perished during the Great Plague of London, in 1665. It should be remembered that the town was a comparatively small place, so that these proportions were immense. About 90 per cent. is the average death rate now of persons attacked.

Coming to more recent times, we learn that in Hong Kong, during 1894, two thousand five hundred people lost their lives; and that in Bombay twenty thou-

sand inhabitants were destroyed between September, 1896, and May, 1897—nine months. In 1900 an outbreak at Glasgow was quickly suppressed, and was, therefore, not serious, thanks to the Authorities.

I now wish to deal with this peculiar microbe. It should be pointed out that when mounted on the slides they are soaked in an embalming medium, and have been so treated that they are rendered powerless. Upon magnifying them to a larger scale, we find that each specimen is a short, thick, round-ended rod or cylinder. Their usual method of multiplication is by division across the middle, when each half lengthens into a perfect bacillus that reproduces itself similarly. One germ is thus capable of becoming millions within a few hours, altering the composition of the fluids and other substances containing them. This is the secret of their actions. They absorb certain constituents for their own support and propagation; and in doing so, decompose or modify the remainder. These microbes were first isolated, or discovered, in 1824 at Hong Kong by the scientist Kitasako.

They may obtain admission into the body through abrasions on the skin, scratches, cuts and wounds. The pneumonic form, affecting chiefly the lungs, may secure lodgement through the breathing channels—the mouth, nose, and throat. The main means of entry are, however, through the punctures made by "biting" insects. Rats are the breeding bases for the germs, which get into the stomach of the fleas that feed upon them. These fleas are called *Pulex cheopis*; while the human being's species is named *Pulex irritans*.

No flea of any kind will feed on cold blood; so that as soon as a rat dies of the plague the insects leave its body, and, if they cannot find other rats, will attack any warm-blooded animals, including man. Although each creature possesses its own style of flea, as a rule, they are never averse to interchanging habitats. The house flea is not regarded as the source of mischief; yet the possibility is ever present that it may cause infection. Male or female rat fleas would not hesitate to interbreed with the domestic variety, among which the disease would rapidly spread. It should be understood that there are only trifling, microscopical differences be-

tween the various kinds of fleas, any species being typical of the remainder.

It has been proved that hares, rabbits, squirrels, and similar creatures are capable of becoming plague stricken; so that where an unusual death rate is noticed among them by foresters, farmers, and other men who have the chances of observation, suspicion should be aroused, and the authorities be informed of the matter. It could soon be determined whether the animals died of the plague.

A flea does not "bite" in the ordinary way—it punctures or bores the skin and superficial flesh. Beneath its head, almost between its front pair of legs (and generally concealed by these limbs), are a pair of triangular plates, between which depend a marvelous set of minute, yet perfectly modelled weapons. There are a couple of thin knife-like blades, and a divisible rasp with its inner faces deeply grooved throughout their length. Within this rasp, when the halves are united, can be laid a notched piercer. In "biting," a flea probes the flesh with the rasp, and then drives its internal piercer deeper down, meanwhile keeping the puncture open by means of the knife-blades. The rasp serves as a sucker for the blood, which, in comparison, resembles the proportions which would occur if an elephant sucked up a lot of marbles, Spanish nuts, green peas, and so on, contained in a thin syrup. We can only make a crude comparison.

It may perhaps be necessary, for the information of some readers, to say that blood is a rich fluid (plasma when in the body; serum when withdrawn) in which float dense multitudes of red, sunk centre, discs or corpuscles, and globular phagocytes, whose duties are the destruction of insidious germs that enter the blood vessels. These phagocytes (which constitute a certain proportion of white corpuscular leucocytes) endeavor to absorb and destroy the germs. If they fail, victory for the microbes means severe illness.

In the case of fleas that have bitten diseased rats, their lancets or puncturing weapons naturally withdraw many of the microbes, and these are quite readily conveyed into the blood stream of the human being who afterwards gets punctured by that flea. That is the most significant point to bear in mind.

Many of the microbes that are disseminated from rats killed by the plague would also adhere to the comparatively formidable claws and bristles terminating each of the six legs of the insect. In this case it would only be necessary for those claws to come into contact with a pin scratch, or other slight wound, to introduce the wretched disease into the system.

Inoculating serum is made with a bouillon culture of the microbes. Blood attacked by germ poison (toxin) develops an anti-toxin or serum, which acts as an antidote. It is because the blood is weak that a fatal result occurs. The principle involved in inoculation serum is that it will induce normal blood to prepare this anti-toxin, so that should germs afterwards get into the blood they cannot multiply, nor cause mischief.

Seeing that a penalty of £100, and a daily fine of £50, may now be inflicted under recently issued orders, for neglecting to report attacks, and for other failures, it will be understood that the scare is a very serious one, and calls for precautions all over the country. A plague-smitten flea can live for three weeks, and can infect anyone during a period of fifteen days after leaving a host—or victim—so that it has plenty of time to get transported miles away, in baggage and clothes, and originate fresh plague spots.

Eating to Live.

Emory J. Haynes says that no doubt man lives to eat. That is, the enjoyment of food is one of the benefactions of nature. The social bond of the hospitable board, the family meal, the dinner of friends is strong to bind us together. The arts have not seemed too esthetic to adorn the noble feast; music, architecture, painting, oratory, literature and every lesser art have lent their graces to meats and drinks.

But for everyday life the diet is a mere means to an end. The end is strength—health and strength perhaps we should say. What we eat gives us power to do or takes away power. Diet is a matter of the utmost importance if we expect to succeed in our calling and to last to any reasonable age. Does the average young man realize this?

Not unless he has trained for a game, or been alarmed by failing health. That there

are dietetic methods that promote a feeling of vigor and efficiency is not generally understood in youth. We learn by experience that certain foods are not for us, though other people may use them. There is no excuse for forgetting the label on what puts us out, nor can we take another man's habits for our guidance.

Insist on eating your own food, and reject food that hampers you in the day's work. The mass of learning on the mind's library shelves is the acquirement of a lifetime. At different periods of life we can not eat and work hard on different foods. It is a constant study.

The point is that one gives intelligent and constant attention to the matter of the food on which he works best; that he remembers the food that incapacitates him; that he makes no compromise nor trifles with rules that he has imposed on himself; that he be elert to refuse those friends who would injure him by kindness; that he be on guard in social hours, for the next day he must work and do his best.

Mere taste is not a safe guide for man. It may be that the lower animals are pretty well armed by taste and instinct. But the condiments that sweeten, pepper and spice man's food are a delusion. We awaken a false appetite and wholly confuse nature. Many things that taste good are almost fatally injurious to the day's work. Repudiate the ingenuity of the cook and judge what will be energy for masterly toil. Toil we must if we would win the prize, and the right food is like fuel to the engine.

In these days of close competition a manufacturer discriminates between different kinds of coal under his engines.

The Square Deal.

The "Engineering Magazine" is in close touch with the industrial world, and recognizes the importance of better sanitary conditions in the shops and factories. The following article, in the December number, is a plea for the wage earner, which should appeal to every thoughtful mind.

"Let us therefore approach the principle of the fair deal with our imagination, our sympathies, our sense of fairness, alert. The great bulk of the population of the United States, both relatively and numerically, a hundred years hence will be descended from those who are the wage-

earners to-day. What our industrial officers make now of the working army, will make our future nation, not dreadnoughts and fortified canals.

"The wage earners are our people and our nation; if not its backbone and skeleton, if not its brain, nevertheless, its important flesh and blood. Moreover, the burden on them is both exalted and heavy. It is the men closest to their bread and butter who generally have correct instincts as to evils even if they often flounder as to remedies. It is the flesh that quivers with physical pain, not the brain nor the skeleton. It is on these workers that the duty devolves of bringing up respectable families on a small and precarious income. There is not room for all at the top, even if all were competent to climb to the top, and one of the great problems is to make to-day bearable without taking away the hope of a better to-morrow.

"A boy apprenticed to a trade ought to feel confident that he has not been allowed to enter a race in which even before he started he was hopelessly outclassed; he ought to see before him a reasonable certainty of tenure of position, of definite and increasing wages per hour until he has reached a maximum for his trade and locality; he ought to be assured of decent, helpful companions; he ought to be certain that all those things essential to his health and safety which he cannot do himself were being done for him.

"As to the man, the worker, without whom industry would collapse, all conditions ought to be standardized. Drinking water ought to be germ-free, life-destroying dust should not surround moving machinery, work illumination should be adequate, not ruinous to eyesight. Working hours should be reasonable and without overtime except in great emergencies, means should be provided for ascertaining directly his needs, his wishes, of listening to his recommendations."

Assurance of Good Milk.

Good milk is the most valuable single article of diet known to man, while bad or unwholesome milk is a source of great danger to health. Good milk is easily digested and contains all of the elements needed for the body; when examined by the microscope, it is found to consist of a large number of round substances, or

globules, which float in a colorless fluid; they are transparent and very small.

These globules are the fat contained in the milk and they have a thin coating, similar to the white of an egg, that is called casein. When the milk stands, the larger globules rise to the top and make the cream, which is the fat, and richest part of the milk, and when the cream is shaken, as in churning, these globules break and the fat runs together, forming lumps, which is called butter.

Milk becomes sour, either naturally by exposure to the air, or by the addition of an acid of any kind. When milk is exposed to the air, minute forms of animal life, called microbes, get into it, or they may be imported into the milk by the use of unclean utensils or articles used in handling the milk, thus showing the absolute necessity for cleaning utensils and receptacles used in handling milk, by thoroughly sterilizing them. There are few if any of the numerous places, such as hotels and restaurants, that receive large quantities of milk and cream daily, who are so careful as to take the precaution of cleansing their milk receptacles by sterilization. For this reason, as well as other very important reasons, milk and cream should be delivered to such places in sealed bottles, which would also prevent the greater part of the milk from being robbed of its natural amount of butter fat, by skimming the cream off at the first dippings leaving the balance contained in the vessel only skimmed milk.

Bacteria gain access to milk in many ways, and multiply and grow very rapidly, thus if not properly handled, this food which is the most beneficial if pure, very often becomes a source of great danger as a disseminator of disease.

There are innumerable cases of dangerous diseases, having become epidemic through a supply of contaminated milk. A striking case of this kind recently occurred where an entire family of six having become afflicted with typhoid fever, which naturally caused an investigation to determine the source of the epidemic; the premises and the water supply used by the family were found to be free from typhoid germs, but finally it was discovered that the cows from which the family milk supply was taken, watered at a pond, and this pond water was found to be infected

with typhoid germs and it was imparted to the victims by the cows drinking the impure water, and the family using their milk.

This shows the necessity for producing and handling milk in the most sanitary manner possible. The cows should have absolutely pure water and wholesome food. The milk should be taken from them in the most sanitary way; the receptacles should be properly cleansed and sterilized; the milk should not be exposed to the air more than is necessary, and it should be transported to the central pasteurizing plant as quickly as possible, pasteurized and placed in sealed bottles and held under a low temperature.

To produce and distribute a supply of pure milk in every house in a city, necessarily requires a large and systematic organization and to handle and distribute this important food product according to the most approved methods, necessitates the outlay of a large expense; but in this age and day, people are demanding foods that measure up to the proper standard as regards both quality and purity. They will not jeopardize the health of themselves or their families for the sake of getting an article cheaper, for that, in reality, would mean the worst form of extravagance. It is this desire on the part of the public to make sure that the food which they purchase, is pure and wholesome, which has brought into existence, the public Boards of Health and Public Food Inspectors, and their achievement toward the improvement of food products and in safeguarding consumers against the sale of adulterated or impure goods has been marvelous.

Science has been able to trace most of the dangerous diseases to their sources, and although it has not been able, thus far, to effect cures for all, it has found means of prevention, which is far more important; but not all has been done that should and can be done; this fact has been emphasized by the most eminent and authoritative members of the medical profession. Certified milk is milk which is refrigerated immediately upon being taken from the cow and put up in sealed bottles to prevent exposure to the air, but in supplying the trade of a large city, this method is not practicable as the expense and trouble of it would discourage many

dairymen from continuing in the business.

Pasteurization, carried on in the proper manner, is the only safe and practical way of supplying wholesome milk.

Nathan Strauss, of New York City, has been pasteurizing and distributing milk for the benefit of the poor babies of New York for 17 years. Before he began the death rate during the summer months was 134 out of every thousand; now it is only 62 out of every thousand, a great benefit largely due to his efforts.

An Arctic Sanatorium.

Sir Ernest Shackleton had had abundant opportunity for learning all about the virtues of cold air. Due heed, therefore, will be given his proposal to establish in Spitzbergen a great international sanatorium for consumptives.

A generation ago such a proposal would have aroused the derision of the public and even of the physicians. But nowadays the sanative qualities of winter air on weak lungs are better understood.

It might be objected, however, that Spitzbergen is a long way off, hard and expensive to get at and not very entertaining when reached. The tuberculous, like others, must have their interests and diversions. Cold, fresh air can be got at a high altitude more conveniently than at a high latitude. The Swiss mountain valleys in winter or our own Rockies are as efficacious as Spitzbergen, as well as being nearer and more entertaining. There the pulmonary patient may have his toboggan slides, curling contests and skating clubs, housewarming arrangements conforming to reasonable standards of living, and home and friends within a few days or hours.

Unless high fashion should take it into its perverse head to turn invalid and flock to the Arctic shores as a refuge from summer heats—making Spitzbergen a sort of inverted Florida—we see no great future for Sir Ernest's suggestion.

Household Pets and Consumption.

Experts of the Harvard Medical School have decided that household cats and dogs do much toward spreading consumption. Thirty per cent. of all the cats in Boston have consumption, according to tests, and the scientists say that this percentage probably would hold in all large cities.

That the public should be on guard against the hitherto unsuspected dogs and cats and that the diseases of ailing pets should be classified, as a measure of safety, are opinions held by such experts as Dr. Langdon Frothingham of, the Harvard Medical School, and the Rev. Dr. F. H. Rowley, President of the Massachusetts Society for the Prevention of Cruelty to Animals.

Dr. Frothingham, who has examined many cats at the Harvard Medical School, says:

"As to transmission of the disease, the greatest danger is, of course, when the cat has tuberculosis of the lungs. Then it may be transmitted when the cat licks the face of a child.

"The fact that children fondle cats and dogs so much more than do grown persons makes the case worse, and certainly in households where the child is fed only carefully inspected milk, and where every other care is taken to keep it from receiving the germs of the disease, equal care should be taken to protect it from diseased pets."

Passing of the Common Drinking Cup.

Among a number of other States Massachusetts has followed Kansas in enacting a law prohibiting the public drinking cup, a reform which when it was first put into effect in Kansas caused great inconvenience to travelers on through trains and much indignation as well as ridicule of Kansas as a State of cranks. But it is a reform that has stuck and been followed in several States.

There is now much complaint in Connecticut and the other four States adjoining Massachusetts because of its new law, with which the traveling public has not become familiar, against the common drinking cup, and some criticism that Massachusetts will have to give heed to. The law, for instance, does not prohibit the owner of a cup from loaning it to every other passenger on a train, and to that extent it becomes a dead letter. It does not prohibit passengers in trains from drinking directly out of the faucet of the common water tank, and this practice is indulged in, especially by immigrants. A law which interferes with fixed habits and customs is bound to be extremely unpopular until its merit becomes generally recognized, and meantime it is evaded in every

way that ingenuity suggests. But the common drinking cup in railroad trains and in hotels and restaurants is a thing that is doomed, and it is to the credit of Kansas that it is the first place on this continent that outlawed this common carrier of disease.

School Desks.

In discussing school sanitation in the British Local Government Review, December, Meredith Young writes that school desks are undoubtedly the most important items in school furniture. He says that "both desk and attached seat must be properly proportioned to the build of the body and to each other. Faultily constructed desks and seats almost irresistibly induce their occupants to assume positions which conduce to deformity and eye disease and cause improper pressure on the important organs in the chest and abdomen. In sitting, the body is kept upright chiefly by the action of certain muscles of the thighs; unless these have a proper *point d'appui* strain first of all ensues and later the muscles give way and the pupil leans forward and rests on his shoulder and elbow; when these become fatigued the weight of the whole upper portion of his body is thrown on to the edge of the desk and a horribly unphysiological attitude results. These ill results can be avoided very largely by supplying adequate support at the points where it is needed. To commence with, the seat of a desk should be just high enough to enable the whole sole of the scholar's foot to rest squarely on the ground when the thigh and lower leg are at right angles. This will be the case with most children when the height of the seat above the floor is about two-sevenths the height of the child. The seat should be deep enough from front to back to support the nates and four-fifths of the length of the thighs (i.e., a distance about equal to one-fifth of the height of the average child in the class). The seat should be slightly hollowed out and sloped gently backward with the front edge slightly rounded, i.e., like an italic *f* placed horizontally; this prevents sliding forward when the pupil is sitting upright. The back of the seat should extend upwards to the shoulder-blades; the lower portion of the seat ought to rise nearly perpendicularly for about one-third of the total height

and the remaining two-thirds should be very gently sloped backwards. The most important parts of the body to support are the "small of the back" and that portion from the seat to the top of the hip-bones.

"As regards the desk, if it be too far away from the seat it involves leaning forward, if too low it necessitates stooping, and if too high the scholar must artificially, and with a certain amount of strain and distortion of the spine, raise his elbow and shoulder to reach up. The edge of the desk should therefore come well over the seat, i.e., a vertical line drawn from the edge of the desk should pass through the seat. From what has been already said it will be clear that the size of the desk and seat must be apportioned to the size of the pupil.

"Girls are relatively longer in the body and shorter in the limbs than boys, and allowance should be made for this in their desks and seats; about three-quarters of an inch is the average distance. The top of the desk should not be absolutely horizontal but should be given a very slight slope towards the scholar. If the head has to be bent down too much or the eyes turned down excessively, unnecessary strain will be produced resulting in early fatigue. If seats with adjustable backs can be obtained any intelligent teacher can apply the above principles. Where non-adjustable furniture alone is available several sizes of desks should be obtained and the pupils arranged in them, not according to their mental proficiency but according to the size of their bodies. Lockers and book receptacles forming parts of desks are not to be commended as they usually collect dirt and are not easy to keep clean."

Man's Redemption of Man.

Two notable articles appear in the periodicals for the first month of the new year, both dealing with the subject of germs. One is by Dr. William Osler, in the American, on "Preventive Medicine," and the other is by an editorial writer in American Medicine, on "Bacteriophobia." Dr. Osler grows deservedly eloquent on the triumphs of experimental and preventive medicine during the last quarter or half century and calls attention to the fact that the man who conquered cholera, Dr. Robert

Koch, is only lately dead. He cites the conquest of yellow fever in Cuba and Brazil as other notable achievements of modern medical science in dealing with epidemics caused by disease germs. The crowning victory, however, he assigns to the sanitary officials who have done such notable work on the Panama canal, which has been admitted to be a problem of health rather than of excavation. During the French control the death rate of white workers reached the tremendous percentage of 170 per 1,000, while it has been reduced by American sanitary methods to fewer than nine per 1,000, a rate considerably less than that in any city in the United States.

Malaria has been robbed of its terrors just as typhoid fever, cholera, pneumonia, diphtheria, smallpox and other germ diseases have been brought under control. Even tuberculosis is in the process of subjugation and Dr. Osler sees with the natural and not merely prophetic eye the time when this dread disease will be wholly subdued. All these achievements have been made possible by study of disease germs and by effective application of the information secured from such research.

It seems almost like a disparagement of this splendid work when one turns from Dr. Osler's article to the editorial in American Medicine decrying in vigorous terms what the writer calls "bacteriophobia," and the numerous "alarms" created by sensationalists who discover that cigars and postage stamps and clothing and paper money and many other things with which the people come in daily contact are reeking and teeming with untold billions of deadly germs. It is both sensible and timely to read these words:

"Bacteriophobia seems to be at the root of the present dread of things we must handle daily. Common sense as well as decency and good taste dictate that we should avoid as many sources of infection as possible—even the least of them—and we must insist upon having clean clerks with clean hands, clean stamps, clean money, clean bread, clean clothes, clean barber shops and clean restaurants, but the point to enlarge upon is this—we get diseases from diseased people as a rule, and not from infected things. Bacteriophobia is blinding us to the real dangers—the living carriers. We know of many serious

dusty day in a city fills the mouths of people with virulent organisms. In these directions it is necessary to continue the crusade, for there we find vital defects. The other dangers mentioned, though real and in need of remedy, are greatly exaggerated."

skin infections transmitted from face to face by barbers, and it is certain that a

Building By-laws and Sanitary Dwellings.

In a paper read before the North-Western Sanitary Inspectors' Association at Liverpool, England, recently, Tom Robinson, M.R.S.I., dwelt on the following as being pre-eminently essential in sanitary house construction:—

1. The prevention of dampness.
2. The sufficiency of air space around dwellings.
3. Size and height of rooms, window area, ventilation, floors.
4. Compulsory provision of (1) coal place, (2) wash-house, (3) pantry or larder, and (4) bathroom.
5. Drainage, water closets, etc., dustbins.
6. Street planning, density per acre.

"It must be readily conceded, said Mr. Robinson, that dryness of house and site is of primary importance. Dampness, we are told, favors the development of consumption, diphtheria, rheumatism, and other serious diseases, and the precautions to be observed require very close supervision.

"As regards the site, and especially the low-lying sites more or less necessarily damp, I think the provisions of the Local Government Board's new Model By-laws are excellent—i.e., the raising of the site to a definite height as regards any particular area above Ordnance Datum. The only provisions in the usual by-laws in most districts affecting the height of the floor level are: (1) That the dampcourse must be below lowest timbers and 6 inches above ground level. (2) That the lowest storey must be of such level as will allow effectual drainage. While these two clauses are very necessary and useful, yet they do not in any average case fix any definite height of floor level. We are now asking the Local Government Board for a by-law which fixes the minimum height for floor above the kerb level at 18 inches. The exact position of the dampcourse in relation to outside ground level is of much importance, and my observation in various

districts leads me to the opinion that this necessary provision is more honored in the breach than the observance. But it is vital, and should be unflinchingly enforced. The modern tendency is to abandon the idea of basements, and this should make the correct and effectual dampcourse more easy of attainment, as well as to simplify the gradient of the drainage system.

"As regards the material to be used for dampcourse, it is important to notice the exact wording of the By-law Model Series (20), viz.: 'Sheet lead, asphalt, or slates laid in cement, or of other not less durable material impervious to moisture.' In my judgment this by-law has been most systematically disregarded in all those districts where the common, cheap, and ineffective "tarred felt" (or shall I call it 'tarred sand paper') has been allowed—see Model Clause, page 90. The material must not only be impervious, it must be durable. Many good forms of bitumen dampcourse are on the market, and are preferable in my opinion to either slates or tarred felt. Sheet lead I have never seen used on ordinary speculative buildings. Pitch and tar carefully graded, and of proper consistency and applied to the full width of the wall $\frac{3}{8}$ -inch to $\frac{1}{2}$ -inch thick may safely be passed. But when all due care has been taken as to level and quality of dampcourse it is a very common occurrence in houses of from £10 to £100 rental to find that the gardener has paid so much attention to the formation of nicely sloped and really artistic flower beds around the house that the soil has been banked up to cover both damp course and air gratings for ventilating under the floors. Occupiers and gardeners need some education on this point, for they not only grow flowers, but they propagate the bacillus which eventuates in 'dry rot' and consequent risks to health. And in this connection I may observe that even yet in the buildings of an average class the ventilation under the floors is inadequate. We must insist on through ventilation, back to front and side to side, with a minimum of blind ends.

"Concerning damp sites, concreting is not of very much use, unless fine stuff is used on the surface and properly floated or grouted. The idea that ordinary concrete is impervious to moisture is fallacious. Even when this process is carefully done,

I suggest that the surface of the concrete under the floor should be at a higher level than the adjoining ground outside the building. Where the natural level of the ground water is within 2 feet or 3 feet of the surface, the site could with advantage be covered with good Portland cement concrete, put on in two layers with a layer of asphalt between, and the provisions of By-law 59 relating to subsoil drainage should be enforced. Compliance with these provisions, and the floor level raised 18 inches or 2 feet above kerb level, ought to make a fairly dry habitation, providing always that the walls are properly built, and the roof, gutters, and downspouts finished in a workmanlike manner. There can be no excuse for dampness or dry rot except the excuse of unpardonable ignorance, carelessness, stupidity, or a criminal haste to make money regardless of consequences.

"2. Air Space Around Dwellings.—Most sanitary inspectors to-day can, with a fair amount of accuracy, give the death-rate of any locality if the density of population per acre is stated. We now realise that overcrowding on space tends to illhealth, and that ideal conditions are impossible when houses are too closely crowded together. Nearly every town in the United Kingdom has been to a greater or lesser degree too closely packed together, and it is in this relation that more adequate powers should be given to Local Authorities to enable them to secure (1) Wider streets, (2) The compulsory planning on the detached or semi-detached principle. (3) A minimum air space at the rear of 500 square feet per house. (4) A standard number of houses per acre. With reference to the width of new streets, I suggest that the fixed amount of 36 feet or 39 feet, now in vogue should be abolished, and the width should be determined more by the possibilities of the use and amount of traffic which the street may be expected to serve. The following widths are suggested: Business thoroughfares of large towns, 80 feet to 100 feet; ordinary streets in residential districts, 45 feet to 60 feet; minimum for any street, 45 feet.

"This would allow of good footwalks and possibly a boulevard on one side at least of every street. In streets where the traffic is purely of a domestic character, the carriageway might be reduced to 18 feet or 20 feet, and the remainder utilized for

grass plots, etc. Our new by-laws: 8 foot footpaths, 23 foot carriageway.

"2. The building of long blocks of houses, terrace fashion, as we call it by way of a compliment, appears to me to be unjustifiable from every point of view, and I wish to lay special emphasis on this point.

"The disadvantages are: (1) Back streets required from 9 feet to 16 feet in width. These require paving, sewerage, and lighting, and the maintenance cost, which is permanent, falls on the rates in most cases. (2) In the case of vermin the occupiers of adjoining houses participate in the resulting annoyance and discomfort caused by the careless habits of others. (3) More danger in case of fire. (4) Greater difficulty of obtaining good light by means of external windows. (5) Unnecessary crowding of houses together. (6) A dull, drab, dreary sameness, no variety. These disadvantages are all avoided by building on the semi-detached principle, and in my judgment the result is fully commensurate with the slightly increased outlay. The land which would otherwise form the back street can be used for back garden, and there is a reasonable possibility of having a sufficient amount of direct sunlight and fresh air all through the house. We are encouraging this idea in our district, and with conspicuous success.

"3. The question of the amount of air space at the rear of houses requires reconsideration. In many districts houses are being built with from 10 feet to 15 feet from the back of the house to the boundary wall. The practice varies very much. Our by-laws prescribe: (1) A minimum of 200 square feet open space; (2) 20 feet clear space measured at right angles to rear of building.

"Some districts I know insist only upon 150 square feet, and even then that amount soon becomes decreased by the erection of coal place, store shed, poultry house, etc. I incline to the view that the open space at the rear should not be less than 500 square feet, that back passages should be prohibited, entrance for all purposes to be from front street, with a side passage 4 feet wide as a minimum. There is no by-law at present fixing the width of such side entrance.

"Some elasticity on the foregoing amounts could be allowed, providing the total number of houses were kept down to a mini-

mum of twelve or sixteen to the acre. Under existing by-laws it is easily possible to build from forty to sixty houses on an acre (excluding roads), a number which cannot be supported from a health standpoint. We must advocate hygiene and common sense development; we never find Port Sunlight, Bourneville, and Letchworth being held up to ridicule; they are laid out on the rational and healthy principles which we admire and commend. In this connection, we are now able to produce direct evidence of the advantages of hygienic surroundings. Let me trouble you to notice the death-rates in Port Sunlight, Bourneville, Hoylake, and West Kirby, as compared with those for England and Wales:

Average Death Rate, 1900-8.

England and Wales	15.69
Port Sunlight	9.63
*Hoylake and West Kirby	11.74
Liverpool	20.4
Bourneville, 1902-7	6.3

*Not corrected for deaths of those who come here as invalids.

Infantile Mortality, 1902-7.

	Per 1,000 births.
England and Wales	131.2
Bourneville	4N4N 80.2
Hoylake and West Kirby	92.2
Liverpool	164.3

Some remarkable figures have been just published with reference to the average heights and weights of school boys, fourteen years of age, in the various schools in Liverpool and Port Sunlight, and while we must be careful not to impute all the differences shown to the superior housing conditions, it must be an undeniable fact that the general sanitary advantages enjoyed by those at Port Sunlight have a very important bearing on the astounding disparity revealed. Briefly the results are as follows:

	Height.	Weight.
Liverpool—		
Higher Grade Schools ..	61.7	94.5
Council Schools (best) ..	58.2	95.8
Council Schools (medium)	56.2	75.8
Council Schools (poor) ..	55.2	71.1
Port Sunlight Schools ...	62.2	108.0

"This table confirms a long-standing impression of mine, viz., that given good surroundings, clean, airy dwellings, accompanied by regular employment, regu-

lar wages, and fair general economic conditions, the British artisan and his family will compare very favorably with any class of society for physique, for sound, healthy living, for mental, moral and physical stamina. It is to the extension of garden cities, coupled with, and not separated from, our industrial concerns, that we must look for the uplifting of the physical, moral, and economic standard of British manhood and womanhood.

"Before I leave this part of our subject I should like to draw attention to the report recently published by the Local Government Board on "Back-to-back Houses." This is the most comprehensive report on this subject that we have ever had, and it contains evidence directly supporting my claim for the abolition of the continuous block system, whether "back-to-back" or otherwise. In the report Dr. Darra Mair says in his summary and conclusions, page 27: (1) The death rate from all causes was greater in the "back-to-back" houses than in the "through" houses to the extent of 15 per cent. (2) The excess of mortality in "back-to-back" houses built in continuous rows was greater still, amounting on an average to 20 per cent. (3) The death-rates from all causes in "through" houses (continuous blocks) and in "back-to-back" houses with side ventilation (blocks of four), were about equal.

"I suggest, therefore, that if "back-to-back" houses built in blocks of four are equal from the general hygienic standpoint, as indicated in vital statistics, to the continuous block system of "through" houses, then "through" houses built in pairs, with a reasonable amount of air space both back and front, will be an advance well worthy of accomplishment.

"I have here two or three plans, approved by my Council, of small houses on the semi-detached principle. They are not ideal, but they show what has been done, and done in every case by ordinary builders catering for ordinary working-class tenants.

"Plan 1 shows fourteen houses built or in course of erection. These fourteen houses occupy just over one acre, exclusive of the street. Rent, 6s. 5d. per week. With baths, 7s. 4d. per week. Hot and cold water throughout. Air space at the rear of each house equals 1,000 square feet,

just sufficient for a nice little kitchen garden, and a small garden at the front. Plan No. 2: Small cottages with more limited space. These are at the rate of 32 to the acre. Side entrances only 4 feet wide. Air space at the rear of each cottage equals 410 square feet clear. No front garden.

"I could show you a large number of other plans of semi-detached cottages which have been built in my district, all tending to show that as far as we are concerned we are doing our level best to develop and extend the idea that the semi-detached system is preferable from every point of view to the continuous block system, and the sooner it is made compulsory the better. Housing schemes which fail to provide a self-contained house, with just a bit of garden where a man and his family can regard themselves as supreme, "and on their own," are not to my liking, and I venture to think that some day such provision will be regarded with contempt by an educated democracy.

"3. Turning now to the house itself and the by-laws which govern the height and size of rooms, I think I can find some points of interest and some possible suggestions for improvement. I think I am correct in saying that the general by-laws in operation in this country fix no minimum of floor area for any room. It is permissible to build bedrooms 8 feet, or even less, without contravening any by-law. Surely some minimum should be fixed, and I suggest 12 feet by 12 feet as a minimum for every bedroom, dining-room, or living-room. The window area by-law is reasonably adequate, but is frequently lost sight of. If every room has window area one-tenth of floor area, and the window is open to the external air, we are assured of ample light. As regards height of rooms, I think the minimum should be 9 feet 6 inches, and there need not be much deviation. Height simply to increase cubic space is not of much use, floor area is more important. If we get window area one-tenth of floor area, and every window made to open for one-half its area, we need not trouble much about special means of ventilation. We shall secure ample light and air.

"I am convinced that we can unhesitatingly advocate the general abolition of the ordinary floor (ground floor), resting on joists with more or less space beneath.

My experience has taught me that in a large number of cases wood block floors, or boards nailed into breeze concrete, can be provided at very little extra cost, and when properly laid on good concrete they are durable, sanitary, and in every way preferable. Most new houses in my district have these solid floors, and they are a real success.

"4. Building by-laws leave the provision of coal place, wash house, larder or pantry, and bathroom optional. I think it is time that each and every one of these necessary adjuncts to healthy domestic life should be made compulsory, in all new houses at any rate.

"I hate to see the coals stored under the staircase, or in some other corner of the house adjacent to the milk and butter, and it will not be much use spending money to teach children domestic and personal cleanliness unless provision is made for their practical applications at home.

The storage of food in a house becomes increasingly important as we realize the dangers of the common house-fly, those carriers of filth and disease, and we cannot regard any house as hygienically complete unless sensible provision be made for food storage.

"5. Drainage.—The by-laws as to house drainage in the various districts throughout the country are by no means uniform; they vary a great deal, but not more than the general practice. It should not in these days be necessary to point out the desirability of having a separate connection to the sewer for each house. This can be done without exception if the Local Authority so decide. The idiotic state of the law on "drain" and "sewer" makes this essential in the public interest, although in some districts a combined drain is allowed under an agreement absolving the Council from liability. But the separate drain is the correct thing and should be insisted upon. A very important item in house drainage is omitted from the by-laws in many districts, viz.: the inspection chamber. This is provided for in the Local Government Board's Model Series, and ought to be uniformly adopted.

"The very controversial question of the intercepting trap must here be referred to briefly. I am of opinion that there is a real danger of having too many traps on the house drainage system. According to the

Model By-laws of the Local Government Board, each house drain must have an intercepting trap, and all the other connections must be trapped, including bath and lavatory waste pipes. This means that all the dirty water, generally containing much grease or fat, from the bath or scullery sink, etc., must pass through three traps before reaching the sewer, viz.: waste pipe trap, gully trap, and intercepting trap. Having regard to the first principle underlying the water-carriage system—that of prompt and unimpeded removal of all sewage matter, I think one may with some justification question the real value of this triple obstruction to the flow of sewage, and in suggesting and modification of this point I would begin with the 6 inch intercepting trap. Whether any intercepting trap is required at all depends upon purely local conditions. I can easily imagine a district having a modern system of sewers, laid at self-cleansing gradients, and constructed throughout in such a manner as to reduce the formation of sewer gas to an absolute minimum, where the primary object of interception need not be considered, sewer gas being non-existent. I am associating a rapid flow of sewage, an absence of obstruction and accumulation with a plenitude of ventilation. Given these conditions, then I think the intercepting trap can safely be abolished, taking care, of course, that the house drains themselves are sound, efficient and well ventilated.

"If the Local Authority permit the existence of foul and insanitary sewers, then sewer gas will be abundant, and must be guarded against. In such cases I suggest that a 4 inch interceptor will be preferable to a 6 inch, and I would here put in a word in favor of the 4 inch drain. For any house under £80 rental a 4 inch drain is quite sufficient, having a discharging capacity, when laid at a gradient of 1 in 30, of 175 gallons per minute, when running full. My further observations on house drainage may briefly be summarized thus: Gradient (ideal), 1 in 30; size, 4 inch; inspection chamber inside curtilage; inspection chamber, minimum size, 3 feet by 2 feet 6 inches; brought to surface; drain laid on concrete; drain tested with water test; Stanford joints to be used in water-logged ground; plain joints to be made with Portland cement; gullies provided with channel tops and waste pipes to discharge therein at least I

foot distant; drains under buildings (except outbuildings such as coal place, etc.) not allowed; drain ventilator or soil pipe ventilator to be of 3/16 metal, with caulked lead joints, to terminate 4 feet above eaves and 8 feet away from any window. I am inclined to think that if these points are honestly observed we might with advantage allow scullery sink waste pipe to be untrapped.

"As regards water closets, we insist upon and secure: (1) Approved wash-down type of basin; (2) window, 2 feet by 1 foot; (3) air brick or louvre for ventilation, and we treat outside water closets on these points like those inside. Ashpits for new houses are out of date. We have not had a new ashpit built in my district for 12 years. (We have, by the way, abolished over 800 old ones.)

"Sanitary dust bins of about 3 cubic feet capacity, and emptied once or twice a week, are a great improvement on any form of fixed ashpit, and should be insisted upon generally. There are many points in connection with house construction which I have purposely omitted, but I think if the foregoing details were to receive that close personal supervision which their importance demands, we should have a reasonable chance of securing healthy conditions in and around our houses, which would tend towards the realization of a higher standard of public health.

"It may be suggested that some of these things are impossible on economic grounds, but I refuse to believe that the richest country in the world is too poor to afford healthy habitations for her people. We have ample wealth; we have ample producing power. What we need, amongst other things, is a wiser expenditure of national wealth, and I am old-fashioned enough to believe that the provision of clean, healthy and happy homes is one of the first duties of every community which desires to maintain or to establish a high standard of citizenship."

The Mothering Class.

A novel subject of absorbing interest has been added to the curriculum of High Cliff School for Girls, Scarborough, England. It may be called "Mothering, practical and theoretical."

A real live baby has been engaged as the "subject," while a trained nurse from Queen Charlotte Hospital, London, ex-

plains to the pupils the best way to bathe and clothe the baby and generally how to be a good mother.

Girls must be 17 or over to enter this class. Eight girls at present take part in the lesson, which may follow such dull subjects as "arithmetic" or "algebra."

Each girl takes her turn in looking after the baby—a plump little girl, aged 13 weeks. They are taught by the nurse the following subjects:

How to bathe baby.

How to cut out and make clothes for her.

How to mix foods.

Scientific feeding and hygiene.

Cooking for the home.

How to detect baby's illnesses.

Every little duty which the careful mother has to attend to in the home is taught the girls by the trained nurse.

They have already learned this valuable "tip" in the art of mothering:

How to tell, by the way baby cries, why it cries and where the trouble is. To distinguish the "teething" cry from the "stomach" cry, the "pin" cry, etc.

Throughout the lessons the subject baby at the High Cliff School, Scarborough, has been a model infant. It is loved by every one.

Women and Public Health.

The important part that women can take in the measures for improving public health, and especially in the reduction of infantile mortality, has been for many years recognized in the appointment of women sanitary inspectors, and in the last few years by the appointment of health visitors and school nurses. The Local Government Officer, England, points out that the appointment of these officers is already authorized in London, and a Bill is now before Parliament to authorize their appointment throughout the country. In order to carry out these duties efficiently special training is required, and many institutions throughout the country have included this work in their curriculum. In London the Royal Sanitary Institute and the National Health Society have been giving systematic training for several years, followed by examinations, and the certificates given by these two societies are specified in the Statutory Rules and Orders issued by the Local Government Board among the qualifications necessary for a health visitor in London.

Editorial

The Health of the Children.

The recent report of the Chief Medical Officer of the British Board of Education, Dr. George Newman, is a most important official document from the standpoint of public health. It deals with the first year, 1909-10, in which the results of the medical examination of the public school children of England and Wales have been ascertainable and comparable.

For some years past there has been a question in the minds of the British people themselves as to the physical degeneration of the race, and this systematic inspection of school children it was believed would furnish the only practicable means of arriving at a fairly accurate knowledge of the facts. Thus, the Act of 1907, of the British Parliament had this point in view and the principle therein laid down was that local authorities should provide for the medical examination of all school children, immediately before, or as soon as possible after, their admission to a school, and at such other times as the Board of Education might select. Following out such directions, it is estimated that not less than one-third of all children attending the public schools could be inspected each year.

Dr. Newman points out as the result of the first year's medical examination that of the 6,000,000 children attending public elementary schools of England and Wales, about ten per cent. of them are suffering from nervous defect in vision, three to five per cent. from defective hearing, one to three per cent. from suppurating ears, eight per cent. from adenoids or enlarged tonsils of sufficient degree of obstruction to require surgical treatment, twenty to forty per cent. suffer from injurious decay of the teeth, forty per cent. have unclean heads, about one per cent. suffer from ring-worm, one per cent. from tuberculosis of the easily recognizable form, and half to two per cent. from forms of heart disease. The report enters into details regarding the magnitude of this evil as well as the character and extent of the attempts which are being made to bring it into subjection.

It is shown that medical inspection of school children should be followed up: (1) by informing the parents of any defect or disease found in the child; (2) making inquiries, after a reasonable interval as to whether the remedy suggested has been obtained; (3) ascertaining, in cases where action has been taken, what the reason is for failure to obtain treatment; (4) taking steps to remove obstacles in the way of the children's obtaining treatment, for example, considering how best to obtain or render assistance in the case of poverty, and bringing pressure to bear in the case of carelessness or indifference and affording further facilities for treatment should such prove to be inadequate in any given area; (5) re-examining all defective children at a reasonable interval, after a primary examination, in order to ascertain any change there may be in the condition originally noted, or the effect of treatment received.

Parental poverty or neglect is to be overcome by: (1) the teacher; (2) the school nurse or health visitor; (3) the attendance (truancy officer); (4) the voluntary worker on the care committee or similar organization; and (5), by the medical officer himself.

Then, in suggesting the order in which ameliorative measures should be applied, it is made clear that the organization of the work of medical inspection itself should be consolidated and perfected; the character of the requirements of each area in respect to medical treatment revealed by inspection should be studied, and a broad conception of the meaning of treatment should be taken and viewed as comprehending all influences, educational, preventive or curative, tending to better conditions of public school life.

Thus, while the defective visual acuity of children, particularly young children, calls for early correction, the rational treatment of many of these children would be an educational modification avoiding the necessity for spectacles. It would diminish the prevalence of bad habits, as working the eyes at a near distance, or insure adoption of suitable type of letter press, and, preced-

ing this, it would remove other unsatisfactory conditions of school life, including bad lighting and defective ventilation, overcrowding and over pressure, which together or separately are sources of fatigue and injured sight.

Again, it is pointed out that physical exercises in suitable playgrounds, have a wonderful bearing upon the health of children. And before sanctioning, therefore, any substantial outlay in specific medical treatment, the Board of Education should insist upon the necessity of receiving assurance that the local authority concerned has taken this into consideration and was really attempting to grapple with the local problem in a broad and scientific way. The British Board of Education advises that existing machinery in each area be used before hastily embarking upon an attempt to create new agencies, institutions or instruments of amelioration, and suggests a healthy economy in the use of such machinery or resources; an economy that might be obtained by wise co-operation between the local authority and neighboring authorities.

Dental disease has received separate treatment in Dr. Newman's Report, probably because it calls for aid from a special branch of the medical profession, the dental; and on account of the universal prevalence of oral trouble, so vast and often so imperfectly appreciated in its bearing upon the general health of the sufferers.

We believe that this report of Dr. George Newman marks a real epoch in the history of education, not only in England and Wales, but elsewhere. The report clearly indicates the lines upon which education should be conducted in the future; and in reading it one realizes the great fact that healthy bodies are a condition absolutely precedent to sound minds.

Inter Alia.

There have been a number of crimes in Ontario during the last year or so committed by people of ungovernable temper or other insane tendencies; people who were known to be mentally unsound and liable at any time to develop homicidal mania. Among the most recent of these crimes is the Goderich case, where a man beat his six-year-old son to death. This man had been arrested a year

previously for threatening to kill his wife. The rumored excuse for insane people being at large in Ontario is the insufficiency of asylum accommodation; and this in spite of the fact that the Provincial Secretary, Hon. W. J. Hanna, is one of the most efficient heads who has ever administered the department dealing with such affairs.

* * *

One of the noteworthy features of this day and generation is the constant seeking for higher standards of living and of warefare against disease and pestilence. Much thought is given right living, attention is given sanitation and hygiene and the effect of our environment on our health is studied. All of these things are to-day regarded as of first importance. A score of years ago we were just awakening to a knowledge that these things were factors in the constant struggle against those ills that beset the flesh, while when our grandsires were boys practically no importance was attached to them.

* * *

In the last few years some of the greatest scourges of mankind have been robbed of their power to harm or knowledge has been given the world by some student which has made it possible for mankind to ward off the attacks of these enemies. Among these are yellow fever, typhoid, small-pox, diphtheria; and much progress has been made in the fight against tuberculosis. Twenty years ago any one of these diseases was considered a most serious affliction. To-day either we may prevent infection or contagion or we may combat the disease and nullify the venom of its attack.

* * *

So it is that we have come, in this latter day, to plead an interest in any movement that tends to better health and higher living. Not only have individuals taken up the battle, but local, provincial and the federal government have been interested. They have come to a realization of the fact that one of the most sacred duties of government is to conserve the life, health and happiness of the governed.

* * *

Winnipeg in many ways has a tendency to lead among Canadian municipalities. The Winnipeg Health Department's cam-

paign of enlightenment on questions of food supplies is a case in point. Well advertised, free illustrated lectures are being delivered by members of the health staff of the city, reliable facts and advice are being disseminated among food and drug dealers and Winnipeg merchants are finding that co-operation is more profitable in this campaign than a spirit of opposition.

* * *

We can have freedom from preventable diseases in proportion as we are willing to pay for it, and economy in this direction means sickness, loss, waste and death. Shall we continue to practice this false economy and incur the penalty? Shall we, while planning cities beautiful, neglect the elementary requirements and conditions of cities healthy and clean and progressive?

* * *

While science has largely extended the list of preventable diseases and is able to look with increasing hopefulness, because with increasing knowledge, upon many that yield more slowly to preventive measures, yet the chief causes of death still present their baffling problems. These are especially tuberculosis, pneumonia, diseases of the kidneys and of the circulatory system, and cancer.

* * *

The intestinal diseases of children must also be included among those in which the mortality lists fail to show improvement. Climatic conditions affect the record from year to year, as they must also that of all pulmonary complaints. With all our efforts for the babies, the infant mortality is still higher than it ought to be. It is not professional knowledge that is lacking here so much as the acceptance of popular instruction in personal and domestic hygiene.

* * *

There seems little doubt that the term "measles" conveys to most people the impression of a common disorder of childhood that is more a nuisance than a disease. Now considering that all authorities on children's ailments are agreed that measles is one of the most fatal diseases of early life, that attitude of mind is a very extraordinary—not to say an unfortunate—circumstance. In this connection one well-

known physician has written: "The mortality bills of large cities show what a serious disease measles is in a community. Among the eruptive fevers it ranks third in the death rate." Yet this important fact seems never to have reached the public, and the mother who is told at a hospital that her child is suffering from measles usually goes away quite pleased to think it is nothing more serious, and with very little idea of treating the condition seriously.

* * *

It is now generally recognized that the members of the medical profession have a special duty to the community in the matter of reporting diseases and facts for vital statistics. If they neglect this professional duty, misery and death will result. If they make their reports as perfect as possible science will be advanced, legislation will be wiser and more effective, and public health and happiness will be increased.

* * *

Hundreds of lumber camps up the Gatineau and Ottawa rivers are so filthy, the increase of cases of smallpox and scarlet fever in them is so great that the health authorities of the Province of Ontario have almost thrown up their hands in despair. One of the principal employment agents in Ottawa says:

* * *

"According to the Provincial law, the companies are obliged to keep a washwoman in camp, but as a matter of fact they don't. They have them in the camps in Western Ontario, but not in this part of the Province of Quebec.

* * *

"Then, again, the law is that a physician should visit the camps regularly, the company being allowed to collect from 50 cents to \$1 a week for that purpose. When men refuse to pay, the company doesn't insist, and there is no way of knowing when the disease breaks out."

* * *

Care for the public health has a wider influence than its direct relation to the country's producing power and prosperity. It must be a matter of concern if any ap-

preciable moral advance is to be made.

* * *

It is easy to divert attention to the more superficial aspects of a problem. This is true in the case of the conservation movement generally. The conservation movement has its moral aspect, for the attitude of one generation toward the next of "after us the deluge," is essentially immoral.

* * *

The right incentive to the conservation of other natural resources, any person who investigates must agree, is the conservation of the public health.

* * *

The matter of health, through modern knowledge of infection and inheritance, has ceased to become a thing of merely individual concern.

* * *

If you are careless of your health; if you fail to pay the proper attention to hygiene; if your chase of dollars leads you to practices that mean an inevitable physical breakdown, you are a social criminal.

* * *

If the community herds its children together, at the age when they are most susceptible to infection, in an environment which makes the schools a hotbed for the spread of disease, and tries to cram them with information while it washes its hands of all responsibility for their physical condition, it is committing a social crime. Many breakdowns of later life are traceable to latent infections contracted in youth in the schoolroom.

* * *

A German scientist has recently announced that many cases of tuberculosis among men of advanced years under his observation are simply the manifestation of germs taken in during the early and resistant years. The system of the child, unaided, may be able to prevent the development of the disease, but the germ lies latent in the glands waiting for a relaxation of the bodily vigor to make its manifestation in the most malignant form.

* * *

Health is absolutely the most important

concern of the home and of the school. The aim of all instruction in hygiene is to make health a habit. Health, therefore, and hygiene demand that a word be said anent the filthy habit of spitting.

* * *

The public should be made to understand this, and that consumption is not an inherited disease, that it is contracted like other diseases from a pre-existing case, the second depending upon the first; that it is also a curable disease if recognized early and properly treated.

* * *

The school children offer the best material to work on in the promulgation of these lessons, and hence they should be taught in the school room.

* * *

If people would cease to spit on the floor, on the walls, on the sidewalks, in street cars, and in public places, and if all sputum were burned, consumption, for instance, would soon cease to be. The sufferer from consumption trained to these health habits is absolutely not to be feared; if careless and not so trained, he is a menace to the community.

* * *

The cruelty to children of which we see most is the cruelty of neglect, often the result of drunkenness. Punishment, the ordinary punishment, is useless and harmful. Power of detention is required with enforced labour for the support of the wife and children.

* * *

Sanitation and recreation go hand in hand in promoting public health and welfare. The standard of health will be highest in those cities where not only is strict attention paid to pure water, milk and food supplies, where the streets and alleys are kept clean, and where there is rigorous regulation of contagious diseases, but where provision is made for the amusement and exercise of the people. Besides, public recreation centers, public playgrounds and public skating ponds will improve the moral as well as the physical standard of

community.

Money expended for improving the health and morals, and for increasing the happiness of the men, women and children of a community, is not an extravagance. It is a profitable investment. The city authorities should receive these requests of the public health and recreation officials in a spirit of liberality and intelligence.

* * *

Even the most conservative of the old school hardly could fail to appreciate the fact that a seat which requires a pupil to hump his back over his books or to sit with legs dangling in mid-air may result in physical ailments which would prove a handicap through life.

* * *

A careful study of the seating problem in the school-room relates to one of a number of problems which concern the comparatively new science of school hygiene. Not that the old methods did not produce men of strength and character and trained minds. Probably they were the exception. They survived in spite of the adverse conditions under which their school work was conducted. Many others of less genius may have dropped out of sight. This is a phase one seldom hears discussed.

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Under the new ideas mediocre pupils are not ignored.

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Under these new ideas the school teacher does not ask vague questions and the pupils in turn are not permitted to recite carelessly. They are taught in any subject to seek related facts rather than to try to memorize a dry mass of worthless details.

* * *

New York, distinguished for having the worst housing conditions in the world, but long the leader in housing reform in America, continues the leadership. Her 7,000 privies are now a thing of the past, and her 100,000 windowless bedrooms are fast disappearing.

* * *

The outlook for the future is hopeful. The old idea that the housing problem

could be solved by building a "model tenement" is fast disappearing. In its place, one finds emphasis laid upon housing laws which will control the situation for all time; on efficient and vigilant sanitary inspection; on garden cities and model small houses in place of huge tenements; on instructive visitation of our immigrant population, and the teaching of the elements of hygiene in the public schools and in the home.

* * *

In treating disease by prevention we must have right living; abolish long hours of work; change unhealthful conditions; get sanitary homes for the people at reasonable cost; let the people own, warm and ventilate properly their street cars; insure the education of the young. There is more value in natural environment than in goodly heritage.

* * *

Perhaps what we need in health departments are women, able women, who can go into the homes of the poor and teach them how and why sanitary methods will improve health.

* * *

A woman in such cases may do much more than a man. She can talk to the housewives and tell them how to care for themselves and their babies, as well as their homes. She can show them how to keep house in an economical as well as sanitary manner.

* * *

The remedy for squalor is education. Law will help some. A law, rigidly enforced, that will prohibit owners from maintaining houses under a certain condition will, of course, remove the chances of their being rented. But even when such laws are in force it is hard to keep such places in good condition after the tenants move in. This has been shown in Gary, the model steel city of Indiana, where model tenements and cottages were rented to foreigners who immediately turned the bath tubs into coal bins, the deep sinks into garbage boxes, and never turned on the water provided for flushing the concrete floors.

A very large proportion of the people who rent squalid quarters do so from choice. Many and many a family has lived in a basement at a nominal rent and saved until able to buy a home. And many a family able to pay a better rent has chosen a crowded, dark and unventilated little tenement, above or below ground, in the closely packed district, because the rent was a dollar less and because they wanted the people close around them.

* * *

To be sure there are people who rent such quarters because they cannot afford anything else, but they are not the majority. And they deserve all the assistance they get. But it is a fact that the majority of squalid livers do so because they do not know any better.

* * *

The only remedy for these conditions is education. Law for the landlord and education for the tenant, with aid for the poverty-stricken, would help some.

* * *

There can be no such thing as a comely city without a clean city. While we talk of beautifying civic centers, let us pause over this commonplace duty which lies so close at hand and which concerns everyone almost every hour in the year. The right sort of a city is a household which claims the pride of its people in little things as well as large ones. Anyone who carelessly or needlessly litters a sidewalk or a street betrays a certain dullness in civic patriotism.

* * *

Particularly does this apply to the merchant who lets the space about his shop or store become cluttered from day to day. This sort of premises never attracts trade and never pleases visitors. It is hurtful to its own neighborhood and to the city at large.

* * *

Cleanliness never proved a hindrance to hard work and competition. It has always been on the side of dispatch, accuracy, quality and large output. Where things are cluttered up, where there is little light in the factory or workshop, where there is

either no place for anything or, if there is, it happens to be elsewhere, not so much good work is done. Competition in cleanliness is a field of competition in which all manufacturers may well indulge, as well from selfish as from altruistic motives.

* * *

There is no doubt that the common drinking cup in the schools, shops, factories, parks and public buildings is a positive menace to the health of the people and will finally be abolished. The number of people in the streets and in public places thus liable to infection with tuberculosis, diphtheria and other transmissible diseases is not known, but is certainly great. And the drinking cup may be the means of carrying the infection from one person to another.

* * *

Experiments have shown that bacteria of one kind or another are nearly always present on the public drinking cup. It is true, of course, that they are generally not of a dangerous variety, but their presence is evidence that disease-producing germs may be carried in this way. The number of cases of diphtheria and scarlet fever is sure to be reduced by removing from the schools one of the common carriers of disease. The public should be protected in every possible way, and doing away with the drinking cup will not be a hardship on any one and is an obvious duty.

* * *

People should carry a drinking cup with them when they are traveling. The folding cup is inexpensive and very convenient.

* * *

Pasteurization of milk is the one thing we can hope for to give us a clean supply of milk. The advocates of certified milk have spent years in producing a system that does not amount to much except in conjunction with pasteurization.

* * *

Instead of the old system of cleaning dairy cows with curry-comb and brush, vacuum cleaners are being brought into use with beneficial results. Such cleaners may be used each morning before milking

starts. They are far quicker and do not scatter dust over the stables.

* * *

No individual of ordinary intelligence would think of contaminating a private water supply, such as a well or cistern. He would realize the need of keeping this undefiled. If he did not appreciate the sanitary need he would unquestionably be moved by a sense of decency. There is no question of the truth of this, yet municipal officials and the heads of private enterprises will pollute the water of streams with sewage and noxious and poisonous acids, knowing at the time that the water supply for themselves and their fellow citizens is drawn from this source. They may make the point that the water will be purified by a filtration plant, but the absolutely safe filtration plant is seldom found while in a majority of cases the water of streams is pumped into the mains practically as it comes from the channel.

* * *

Such water is an active source of typhoid infection. Not only does it threaten this danger but it also menaces the general health because of its impurity. No person may drink impure water for any length of time without a debilitating effect. This may not show in an attack of typhoid nor in any other illness, yet the individual will suffer.

* * *

Time was when health departments charged pneumonia almost solely to the hibernating habits of the average flat dweller. But in the light of recent studies and observations, it must be admitted that for danger from foul and germ-laden air, the cars on many city transportation lines have the steam-heated, unventilated flat backed off the map.

* * *

The next time you go into a place where the air is still and quiet, where no drafts are felt, notice how quickly you become heavy, "logy," sleepy, yawny and then get a headache. On the other hand, a breeze in summer or winter stimulates you; does it not? Drafts of pure air are invigorating.

Drafty places are healthier than unventilated places. There is less pneumonia in them. But ventilation which brings about proper circulation of air with the elimination of direct draft, is better still.

* * *

The housing problem is largely a health problem. Here is a hovel or a shack or a disease-breeding tenement. It is a nuisance and the board of health so declares it. Then what? It should be abated. No man has a right to maintain a disease-breeder in a community.

* * *

As a rule, after notice to the owner, the nuisance should be torn down, removed, reconstructed, repaired—some method adopted to protect the community from its vile and vicious influence. The doctrine of personal rights does not shelter a public enemy, as every man is, who persists in keeping up a disease-breeder.

* * *

One of the few known public school sanitary clubs is that called Junior Volunteers, started last month in Oakland, California. The object of the club is the betterment of sanitary conditions, seeing that school buildings and grounds are kept clean, and other matters of general interest to the school. The idea is a good one and might be adopted with advantage to the general health of communities in many parts of Canada.

* * *

The advice usually given in incipient cases of consumption, that the patient should give up indoor work and take up some outdoor occupation, is often detrimental. If he be successful in obtaining outdoor work, he usually earns a smaller wage, and thereby loses vitality on account of not being able to procure proper nourishment. It would be better for him to keep to his indoor employment, but to sleep under the best possible conditions at night.

* * *

Care in the use of one's clothing that it be not cold and damp, keeping the feet well shod, attention to the working of one's physical body, and getting fresh air in plenty is one of the very best ways to secure and retain health.

Bacteriology of Commercially Pasteurized and Raw Market Milk: No more important work has there been for a long time within its line than that published in December by the United States Bureau of Animal Industry — the investigation by S. Henry Ayres, bacteriologist, and William T. Johnson, Jr., scientific assistant, on the "Bacteriology of Commercially Pasteurized and Raw Market Milk." From the commercial questions of bacterial activity to the medical ones of digestibility of the pasteurized product there have been diverse opinions of seemingly authoritative men, and what investigation has been possible has been the nibbling about the edges of one of the most important questions of the day. These two men have been able to take on a larger and broader plan, the consideration of how pasteurized milk behaves, and have upset the conclusions that have hitherto been prevalent. They show that pasteurized milk always sours and that the belief that the process may be a cover for any old, dirty milk that a farmer or a contractor may choose to pass through it, is not going to be acceptable. The argument will no longer hold that pasteurized milk will putrify before it sours and that "nature's danger signal," in the souring, will not be available. Another supposition that can no longer be maintained is that in the pasteurized milk the bacteria will multiply enormously fast, because those that tend to hold the others in check have been destroyed in the heating. These two matters are of import in the use of a milk that has been heated, for they establish an entirely different relationship between this milk and the public health.

The investigation, which was made with milk taken from the regular supplies of Boston, New York, Washington and some smaller cities, adopts for its system the holder process of pasteurization (140 to 150 degrees for twenty to thirty minutes) and bases its results on such a system alone. The "flash" method, in which there is a very short exposure to a high temperature, seems not to be practicable and in commer-

cial work, according to these authors, it is doubtful if a temperature higher than 150 degrees Fahr. will ever be used. The higher temperature, it seems, is liable to injure the cream line, a cooked taste may be produced, while the cost of pasteurization is increased by the need of more steam.

In their consideration of the subject the authors note that much further investigation is needed to clear up all of the points.

The pasteurization that Messrs. Ayers and Johnson recommend is 145 degrees Fahr. for thirty minutes. This will be sufficiently high to afford protection against pathogenic or disease bacteria and yet will probably leave in the milk the maximum proportion of lactic-acid or souring bacteria and the group proportions between the different bacteria will be similar to those in the usual grades of raw market milk.

The investigators realize that some degree of infection must come to pasteurized milk during subsequent handling, for there are here tanks, pipes and the cooling apparatus, to say nothing of the bottling process; so they made a special consideration of this matter and report that the results show this infection to be very small. With reference to the claim made by very reputable observers that bacteria increase faster in pasteurized milk than in raw milk, Ayers and Johnson note that such comparisons have usually been made in milks of very different original bacterial content. Placing the two kinds of milk on the same initial basis they find the increase in them to be about the same when the temperature conditions are the same.

And also, while it is true that much research is needed to determine the thermal death points of pathogenic bacteria, and the survival of certain strains of the lactic-acid bacteria suggests the survival of strains of similar tenacious pathogens, the two cases are practically very different. It will undoubtedly be possible to isolate strains of the typhoid bacillus that are heat resistant, but the possibility of such strains existing does not in any way detract from the value of pasteurization as a protection

against them. The reason for this is that there are never more than a very few pathogenic bacteria present in milk, and the possibility of heat-resisting strains among these must be infinitely small since they form only a minute percentage of the whole.

Points in Dental Inspection: 1. The early age at which dental caries is found makes it absolutely essential that, for school children, inspection and treatment should begin with the youngest.

2. To obtain the greatest possible benefit from the work and for the money expended, attention should be concentrated upon the "six-year" molar.

3. To maintain dentures made artificially sound in good condition, periodical examinations should be made.

4. The teaching of oral cleanliness, and the use of the tooth brush, should begin in the infant schools.

Ventilate the House: Why is it that so many housekeepers who see to it that their houses are spotlessly clean, with nary a speck of dust nor mud, do not appreciate the value of clean, fresh air in the home? In the summer, when one is glad enough to open the windows, proper ventilation is an easy matter; but when the cold breezes blow and the coal supply is not unlimited, the housewife seems to think if the bedroom windows are open for five minutes in the morning this will supply enough of the life-giving ozone to stock the house for the day.

To begin at the bedroom. It is the idea of most housewives that to turn the bed covers back for a few minutes before the open window will sufficiently air the bed. And such is the idea of many of us. But the covers should be spread over two chairs by the window and the mattress turned back. These should be aired well before making the bed. Every window in the room should be opened, and, in fact, one window, in lieu of other ventilation, should be partly open all the time except when a storm would drive through.

In the kitchen the frequent opening of the outer door, generally lets in sufficient fresh air, but the living room is a different matter. One plan is to have a car-

penter make a 2-inch board to fit across the outer sill so that when the sash is closed down it meets the board. In this way there will be a space between the upper and lower sash in the middle of the window, which will permit of sufficient fresh air entering. If varnished, the same as the other wood-work, this will not mar the appearance of the window.

Public School Physiology: Detroit has what is considered one of the finest courses of physiology taught in the public schools of any city, embracing many features, such as civic hygiene and school hygiene, that no other cities touch. The course is begun in the lowest grades and continues through the eighth.

The following is quoted from the introduction to the outline of the physiology course from which the teachers work:

"The special purpose in teaching physiology and hygiene in the elementary grades is to help the children to form right habits of living. Experience has clearly shown that the young are influenced much more by example than by precept. For this reason the teacher should strive to avoid all preaching, if his instruction is to be effective.

"The topics outlined are not intended to form a logical course of study in physiology and hygiene. The aim is to help the pupil to intelligently interpret and understand some of the more external phenomena of the human body which may come under his notice and to direct his attention to some of the simple laws of hygiene which underlie right living. It is not believed that a child can form habits of cleanliness and temperance simply through learning why cleanliness and temperance are desirable and necessary. It is hoped, however, that such knowledge may tend to prevent the formation of bad habits and to reinforce and strengthen good habits when they have been formed.

"There are many phases of physiology which should not be touched upon in the primary schools. Too much introspection on the part of children is not desirable. The topics studied should, as far as possible, be those which will satisfy the natural curiosity of a healthy child-mind.

"Teachers should always be ready to seize upon a favorable opportunity to teach a

subject. If a pupil is struck in the eye by a stone, the time is opportune to talk about the eye and the value of sight. If a child injures his foot upon a rusty nail or a tin can, it is fitting that the teacher immediately discuss the proper cleansing and care of such wounds. This would also be a favorable time to impress upon the children the danger of carelessly throwing glass, tacks, tin cans and like articles upon the playground or upon the public highway.

"The State law requires every teacher to instruct his pupils upon the effects of alcoholic drinks and narcotics as well as upon the most approved methods of preventing the spread of contagious diseases. To comply with these legal requirements without violating the generally accepted laws of pedagogy makes an unusual demand upon the good sense of the teacher. We must comply with the spirit of the law, but in the lowest grades at least the instruction along these lines must be very general in its nature. Little children are extremely susceptible and there are many things in the field of physiology and hygiene of which a child should not be made conscious until much later.

"The instruction should seek to make the children temperate in everything—in eating, in drinking, in playing and in all of life's activities. The lesson of moderation is a most valuable one. In discussing the effects of tobacco and alcoholic drinks the teacher should be moderate and restrained in her statements and her teaching should not be swayed by sentiment. It must be borne in mind that there is much honest difference of opinion regarding the use of alcoholic drinks and that in many homes the children see these beverages on the table regularly. In view of this fact teachers must be conservative and tactful in presenting these subjects and must confine themselves to a strict statement of facts.

"Physiology and hygiene are to be taught at least one period each week, at such time as the teacher finds most convenient."

Human Germ Carriers: It is known that there are men and women in perfect physical condition who carry and spread the germs of typhoid and therefore are dangerous. An unfortunate rival of the famous "Typhoid Mary" has been discovered in the person of an Adir-

ondack guide, who was found to be the unconscious cause of a typhoid epidemic in an Adirondack camp last summer which caused the death of two persons and the illness of thirty more.

It appears that the source of the infection was discovered only after a patient and difficult search, and the man has been placed under a treatment in New York, which, it is hoped, will rid him of his germs and prevent him in the future being a danger to the life and health of any person with whom he may come in contact. There was no law under which he could be restrained, but he expressed his willingness to be isolated and take any treatment that was advised, which proves that he is a very decent fellow.

Hints re Pneumonia: The season is at hand when pneumonia is most prevalent. Statistics show that the disease is most apt to occur during periods of greatest vicissitudes of temperature and humidity. While exposure to cold is incapable per se of giving rise to the disease, the condition known as a "bad cold" acts as a pre-disposing cause, rendering the patient more than ordinarily susceptible to pneumonic infection. The disease being infectious, and by some authorities regarded as contagious, the mode of infection probably being by inhalation, persons should be extremely careful when in contact with those having the disease, and more especially so when one has a cold. Wear warm clothing, avoid extreme changes of temperature, keep your home, and especially sleeping rooms, thoroughly ventilated both day and night. It especially behooves those who have had a previous attack to use every precaution, as one attack rather predisposes to a second.

Typhoid Vaccine in the United States Army: So convincing have been the experiments made by the United States army surgeons with typhoid vaccine as a preventive against typhoid fever that the chief of staff, Major General Leonard Wood, has issued a general order looking to the vaccination of the entire army, if possible, with this vaccine.

The administration of anti-typhoid serum, as now practiced, is harmless. The protective value of this measure has been fully demonstrated, as shown by reliable statistics.

In order that the United States army may, as far as possible, have the benefit of the protection thus afforded, and enjoy immunity from the disease, commanding officers throughout the service are enjoined to use their best endeavors to bring about the voluntary acceptance of this prophylactic treatment by all officers and enlisted men and by all civilians resident at military posts, except those over 45 years of age and those known to have had the disease.

In case of an outbreak of typhoid at a post, compulsory vaccination of the entire population, including the families of the men and civilians, may be had in the discretion of the department commander.

Gould on Cancer: Sir Alfred Pearce Gould, senior surgeon to the Middlesex Hospital, delivered in December before the Royal College of Surgeons of England the 29th annual Bradshaw Lecture. He chose for his subject "Cancer," saying in substance that the disease, as recently discovered is not limited to man, but occurs in all vertebrate animals and can be transferred from "host to host," but seemingly not to an animal of another species, a cancer cell being not an alien cell, but influenced by its neighbors as a normal cell is. Cancer he defined as cell life that is disorderly from some as yet unknown cause.

Sir Alfred expressed the opinion that clinical experience and experimental pathology throw some ray of hope across the dark sea of malignant disease. The deep impress of the primal laws of development holds the cells of tissues in true and loyal obedience to the very end in the almost infinite majority of cases and in the large majority of individuals. The incidence of disease and immunity from its initial attack are of course complementary, and the same fact can be expressed either in terms of disease or in terms of immunity. This apparently is the great initial fact of cancer—immunity; that in spite of added years, and of all unfavorable conditions which tend to wear down the obedience of cell activity to fundamental laws, 90 per cent. of men and women who pass down the hill of life hold this dread enemy at bay.

There is, he said, cure of cancer apart from operative removal. All therapeutic

cures are obtainable only by the working of physiological — perhaps psychological — forces, and the first hope of therapeutic success comes from observation of the efficiency of unaided Nature to accomplish cure.

Sir Alfred's final opinion was that when the biologist shall know the laws that govern cell-growth, with a knowledge akin in its sweep and accuracy to that of the astronomer, he will have power—the power to prevent, to control, and to cure cancer.

Diagnostic Points: Scarlet fever.—Early symptoms are lassitude, vomiting, sore throat and fever. Redness in back part of mouth, "strawberry tongue," glands near angle of jaw are swollen. Usually within 24 hours a fine red rash appears and soon spreads over the entire body. The eruption is red and uniform, as contrasted with the blotchy, irregular eruption of measles.

Measles.—Usually begin with drowsiness, fever, eyes inflamed and sensitive to light, symptoms of cold, sore throat, sneezing and coughing. These symptoms may increase until the skin eruption appears, usually starting on the face, especially the forehead, and spreading over the entire body. This eruption consists of small red spots, irregular and blotchy in character.

Diphtheria.—Pain, fever, cough, soreness of the throat usually mark the onset of diphtheria. The throat soon becomes inflamed and small spots, grayish white or smear colored, appear on the tonsils or in the throat. These spots enlarge, coalesce and a membrane is formed which may cover some or all the surface of the tonsils or throat. This membrane may be lower down in the throat, or above in the nose.

Whooping cough.—This may at first simulate a slight bronchitis or ordinary cold, lasting from one to two weeks, when the second stage appears. The cough changes its character, becoming paroxysmal, and the long inspiration and whoop are heard, or there may be a series of explosive coughs followed by a noisy whoop.

Chicken pox.—The eruption is usually the first sign of this disease, which may be associated with slight fever. The eruption, which consists of elevated spots, varying in size from a pinhead to a large pea, generally appears on the face or back and extends over the body.

Open Mail

To the Editor, *Public Health Journal*:

Preventive Measures.

Sir: Consumption is a disease of civilization. The coddling habits we have got into, resulting in living in rooms with no ventilation, breathing impure air day and night, have resulted in ninety out of every hundred people being unable to breathe sufficiently for the imperative needs of the organism. Nasal congestion, as a consequence, is rampant. Medical school inspection finds that many school children are suffering from some form of it, and especially from adenoids. Surely that one fact gives the key to the whole situation. The first step, then, is to get at the children. Medical examination must be brought to its logical conclusion. Nasal congestion must be relieved, and the children taught to breathe correctly.

I am prepared to maintain that consumption, in the first place, is due to insufficient oxygenation of the blood, due to inability to breathe properly. The freeing of nasal congestion can be accomplished without operation in all but such cases as a spur of bone obstructing the passage. With freed nostrils nasal breathing will be easy, and burn up the carbonaceous waste in it. Then the bacillus will beat a retreat. No person breathing fully and freely can ever suffer from consumption.

Hygiene must be taught in schools, compulsorily, by competent teachers. Where it is taught now it is done in a happy-go-lucky way that is of very little use. Correct breathing exercises must be given in all schools, public and private, and the teachers of this must themselves first be taught in the right way. There should be compulsory adequate ventilation of all rooms, public and private, and of all theatres and other places of amusement, and all churches. The last are the worst offenders; in the city of Toronto I have often found the leading churches so rank with foul air as to be absolutely stupifying. Carpets in bedrooms should be banned, and cork linoleum and rugs substituted. Windows should be always of a kind that will open top and bottom, not

the absurd casements prevailing at the present time. There should be a few minutes' interval after every hour in a school-room, and the room thoroughly aired before another class is taken. Lectures should be given in all schools, public and private, on the simple needs of the body in regard to air, light and bathing. From experience I can say that these lectures can be made exceedingly interesting.

Until these things are done compulsorily there will not be the quick stamping out of this fell disease that there might be. People are too ignorant, too lazy, and too prejudiced to make changes. The discovery of almost universal nasal congestion is the greatest that has been made in the history of consumption. It is far more important than the bacillus; and correct breathing is of far greater moment than inoculation by tuberculin, which is a distinctly retrograde movement in this crusade. I must not trespass further upon your space, or I could say a good deal about the faults of the sanatorium system, and how they might be corrected. Were the open-air cure carried to its logical conclusion, ten times as many patients could be treated as is now possible under the present very unsatisfactory conditions.—I am, &c.,
J. W. W.

Championing the Cat and Dog.

Sir: It is nothing new for any intelligent and thinking person to be told that the average prowling dog and cat is not a safe companion for children nor a proper inmate of our homes, but the writer begs most emphatically to take exception to the opinion of the learned specialist who places all of these faithful fireside companions under the ban.

Take, for instance, the beautiful Persian and other fine breeds of cats which adorn so many homes these days and also are to be found in many of the fine catteries of cities. They never see the outside of homes unless in harness or carefully guarded; must they, perforce, be banished from the face of the earth because the prowlers are dangerous? Will the learned

doctor be a little fairer and discriminate between those that are dangerous and those that are not? It would seem, were these family pets to be entirely eliminated, as if there would be a lack of the home environment of which poets have for so many years sung. Leave us a few just a little longer, doctor, for there are many among us who love dogs and cats and need them for friends. S. E. K.

To Get Good Ventilation.

Sir: For the "comfortable" ventilation of a street car, the following mode will give desirable results: Open one ventilator on each side at front end of car. Open two ventilators on each side at rear end of car. Fasten all the other ventilators. Thorough "overhead" ventilation is thus secured, free from the objectionable "lower draft." If the animals with the blacksmith bellows lungs cannot then get enough air, they can always obtain the desired amount "behind" the rear platform. There is no reason why one or two cranks should be allowed to get "air" by giving everybody else the "breeze." As a further source of comfort, orders should be given to the motorman to close the "exit" door before starting the car. The practice now is to let in a carload of icicles after he has started, before closing it. HAF FROAS.

Properly Housing Separators.

Sir: The use of the separator is no longer an experiment with the farmers and dairymen, as most every farmer keeping two or more cows is using one at the present time. In order to secure the most efficient work from the farm separator, and in order to have the cream pure and in the best possible condition it is necessary that the separator be kept perfectly clean and in clean surroundings. Of the cow stable, corn crib or kitchen, the latter is the most desirable, but is no place for the machine, and for several reasons: first, because it is in the way; second, the temptation is strong for the housewife to take charge of it and of the process of separating, and this is not a fit task for her, as it requires more strength to operate the separator than she can spare from her other duties of household and kitchen work; third, there are odors in the kitchen that should never come in contact with the separator and especially in the win-

ter when the ventilation is somewhat close and imperfect these odors are apt to be noticeable in the cream and butter. The cow stable and corn crib are alike unfit for perfectly obvious reasons. Then the question is, where shall the separator be kept? The ideal place for the separator is in a room built especially for the use of the separator and cream. If a concrete floor is put in this room so much the better, as it will be much easier kept clean and sanitary. My separator room is built adjoining the cow stables with an entry or hallway between the two with swinging doors at each end of the hall. These doors swing both ways and prevent all dust or litter from getting into the room. This room being close to the stables makes it convenient for taking the milk direct from the cows to the separator. Of course it is necessary to have warm water in this room and by running a one-half-inch gas pipe from my feed cooker into the water tank or rather a sink that is in the room it is an easy matter to heat the water to whatever temperature desired. I also have an ice box in the room and in this I keep my cream until deliveries are made. All of this equipment can be provided without much outlay of actual cash. The work can be done by almost any practical farmer, and the expense for material is about all the money one needs to be out on such a building, and this expense is but a trifle when you take into consideration the advantages such a room will provide in handling the daily product.

A SUBSCRIBER.

The Duty of the Sanitary Inspector to the Community.

Sir: The duties of the sanitary inspector to the community are many, and are surpassed by those of no other officer. He, first of all, should thoroughly post himself as to his duty, and the law governing the same.

He should go to the people as a teacher goes to his pupils, with a full determination to patiently and thoroughly teach them what they should know.

He should be courteous, never forgetting that he is a gentleman; kind and sympathetic, remembering that it is easier to rule by kindness than by force.

Above all things he should be just, treating everyone as nearly alike as possible, at

the same time he should be firm, insisting and seeing that his instructions and orders are carried out.

He should try to make friends of the people in his territory, remembering that all men are presumed to be law-abiding until the contrary is shown.

A man who carelessly or thoughtlessly violates a law is not a criminal and should not be treated as such.

The sanitary inspector should be a hustler. He should cover the territory assigned him thoroughly and not in spots. He should give all his time when on duty and take an interest in his work and the welfare of the people in the community in which he is serving.

He should, if there be a public or private school in his community, keep a close watch over its patrons and take prompt action when any disease or suspected disease shows up.

Another duty which I should have mentioned before is that he should be frank with everyone. If a person fails to carry out his orders he should first ascertain, if possible, the cause of such failure.

With the few men which our health department have it is utterly impossible for the sanitary inspector to give the community the service it should have, owing to the large territory and the further fact that so few of our citizens are in sympathy with our work.

Our citizens need a sanitary teacher more than they need a sanitary officer, although I do not wish to leave the impression that it is never necessary to make an arrest.

The praise and the reward should not go to a man merely because he makes a number of arrests. Arresting, as a rule, does not leave as much respect for the law as can be obtained otherwise.

A sanitary inspector must remember that the community does not, when he makes a mistake, place it wholly upon him, but place their criticism upon the head of the health department, therefore we must be conservative.

W. R. A.

A Traveller on City Smoke.

Sir: Many European cities, unlike cities of America, are clean and free from soot, because the laws are enforced. There one wakes up clear-headed and fresh. Here in the majority of cities one finds the voice husky and the brain listless, because all night the lungs have been inhaling smoke. There, women shoppers have not the fatigued look that one sees among the customers in our large stores, nor the streaks of dirt that so often mar our women's faces.

It causes fatigue and lack of endurance. We as citizens have the right to our health and energy, and they are being taken away from us. The overlords of centuries ago came down from their strongholds and took the people's possessions; but our overlords, puffing clouds of smoke into our lungs from their chimneys, are taking away our health and vitality—the most precious of our possessions.

The anti-tuberculosis organizations should take up this fight against smoke, which has so much to do with breaking down the resisting power of weak throats and lungs, and the skin and cancer hospitals should take up the same matter.

It is a matter of common knowledge among physicians that city lungs are black, as compared with the healthy pink of the lungs of country or town dwellers. Hardening of the lungs is one result of the blackening process.

There are places in Switzerland where the air is so pure that the best means of healing wounds is to expose them. Compare that with our smoke-laden atmosphere, and see how hard it must be for nature to do its proper work.

Our smoke wastes coal, money and public health. It wastes human life. The enforcement of the smoke laws would mean economy, improvement of property and increase of individual energy. We must create a public sentiment to force the servants of the law to enforce the law. Our non-enforcement of our laws tends toward anarchy. T. B.

Meetings and Reports

The Canadian Forestry Association.

The Commission of Conservation meets on January the 17th in Ottawa. During the following three days the Canadian Forestry Association will hold a convention in the same place; this arrangement being most convenient as the members of the Commission are also interested in or are members of the Forestry Association.

The chairman of the Commission, the Honorable Clifford Sifton, will propose the organization of a fire-fighting and a fire-preventing corps after the plan of a mounted police force. It is undoubted that millions of dollars worth of timber are annually destroyed by fire on this continent, and it behooves Canada as apparently the last refuge of the natural forest in America to do all in her power to adequately preserve this magnificent resource.

Afforestation where practical is also most desirable, and this is another of the aims of the Canadian Forestry Association.

Conference of Health Promoting Institutions.

Last month a Conference of Health Promoting Institutions was opened by the Lord Mayor of London, England, at Guild Hall. The Conference was organized by the National League for Physical Education and Improvement.

In welcoming the delegates the Mayor discussed the evolution of public health in England, pointed out that the whole conception of the nature and sanctity of human life had undergone a complete change since the days of "Hardy Forefathers."

We had now grown to realize that they were "hardy" because none but the hardy lived. Those forefathers of ours might have been entitled to say of themselves, as, indeed, they did say in a State paper in 1515 preserved in Guildhall, "What comyn folk of all the world may compare with the comyns of England in riches, freedom, liberty, welfare, and all prosperity? What comyn folk is so mighty and so strong in the felde, as the comyns of England?" We were told they were fed on "great shins of

beef" until they became, as they were described a little later, "the English wild beasts." For centuries, however, they increased in numbers, but slowly. The terrible law of natural selection, which issued in "the survival of the fittest," cleared off the less physically fit in every generation—principally by infantile disease, and often by wholesale famine and pestilence. At best their lives were but little above that of the animal. It was against that stunted conception of human life that civilization waged its unceasing warfare. All the legislation which had grown out of the regulations framed by the early City Fathers to protect the people against the ravages of epidemic disease had proceeded to establish the idea of duty resting upon the individual and upon the community to perceive and to obey the laws which governed the conditions of physical health, not only for the individual, but for the vigor of his offspring. The sudden and unprecedented change brought about in the early years of last century by the introduction of steam and the extension of commerce, with its general ease, and its reduction in the burdens of life, produced an enormous increase in the population. Millions of fresh human beings found employment and brought up families, who, in their turn, learnt to live more or less civilized lives. A new phase of humanity brought with it new modes and conditions of life, new vices, and new dangers, with also new conceptions of duty, and of how that duty should be performed. From those early beginnings and rudimentary forms, had grown the branches of special knowledge now embraced by the modern professions of medicine, surgery, and sanitary science. The various health societies which had grown up alongside those professions represented the one and self-same beneficent purpose of promoting the enjoyment and extending the duration of human life. Foremost in the ranks of these noble institutions stood the societies of their hospital and home nurses; the bodies which trained inspectors, male and female; and that later creation, the corps of health visitors, who

carried a knowledge of the laws of health into the homes of the people. It was a striking feature of the development of modern medical science that it had divided itself into the two great branches of study and practice which severally related to the curative and the preventive sides of the subject. It was infinitely gratifying to find how constant was the effort of the profession to advance measures of all kinds tending to prevent disease and secure conditions favorable to the preservation of health and physical vigor. It had been well said that to gain experience in the office of health administration, was to receive an abiding impulse in the service of humanity. The accumulated experience which was represented and would be circulated through the conference of so many health societies might well tend to extend and strengthen that service.

The Fife Committee on Medical Inspection.

At a meeting of the Fife Committee, of Scotland, with regard to the medical inspection of school children, held last month, Provost R. C. Munro Ferguson, M.P., criticized Dr. Dewar's reference, as Medical Officer in his report, to the examination of senior girls, which he described as an attack upon the members of the Committee and a breach of discipline.

Provost Ferguson said he had had considerable experience in the work of Local Authorities, but it had not hitherto been his experience to find any official making an attack upon the opinions expressed by members of the representative authority. Their original policy was to have a lady doctor, and the burghs joined upon that understanding. That idea was unfortunately checked, but it still remained an open question, and ought to remain an open question. One of the reasons given by those who believed in a lady doctor being upon the staff was that it would be better that the senior girls should be inspected by a woman rather than by a man. The Medical Officer, Dr. Dewar, interpreted this plain matter-of-fact statement into a suggestion of innuendo against the medical profession. That was an insulting attack. Further, he considered the insertion of the paragraph in question a breach of discipline. Dr. Dewar concluded the paragraph by sincerely trusting that such unpleasant innuendo would never be uttered again. He (Pro-

vost Ferguson) sincerely trusted that no official would be guilty of breach of discipline in publishing a paragraph of that kind. A vote was taken on the question and it was resolved that the paragraph be deleted.

New York City Consumers' League.

The Consumers' League, of New York, under whose auspices an exhibition of articles made in sweatshops was held in that city last month, placed before the public a vital picture of the dangers encountered by women and children who work upon different articles of wearing apparel for low wages.

The walls were hung with garments made in long hours by little children and their mothers, and there were photographs of the workers showing the surroundings compelled by the little they earn.

Beneath a huge black willow plume was a placard telling that little children are employed in the work of making willow plumes because their small fingers can tie the delicate fish knots required in the work. A mother and two children who can make a plume a day receive one cent for every forty-seven knots.

Under different articles of apparel were placards, nearly all of which declared that the workers labored fourteen and sixteen hours a day to earn less than a dollar.

Upon a wall were three pink paper carnations. The daily output of the worker is 100 flowers, for which she gets 40 cents. Nearby was a necklace of pale blue beads. There were sixty-one beads of eight sizes with a clasp attached. The maker works twelve and fourteen hours for 45 cents. The pay is 30 cents per dozen necklaces.

There was a baby's crocheted jacket with the information that the worker put in sixty hours a week, finishing up her labors with an output of two dozen jackets, and had been paid \$1 for the seven days.

Above a celluloid hairpin encrusted with brilliants was a sign reading "Dangerous Work." The woman who works over her gas stove setting the stones in the soft material imperils her life as she sets 105 for two and one-half cents.

Other signs on the walls urged those who wished to aid in the work of bettering conditions for children to join the forces of the Consumers' League.

Association of Life Insurance Presidents.

The Conference of the Association of Life Insurance Presidents, held last month in Chicago, dealt largely with Public Health affairs.

Three papers were presented on the question of prevention of disease, a question which is receiving much attention in connection with the international campaign of conservation. Dr. Eugene H. Porter, of Albany, State Health Commissioner of New York, the first speaker, commented favorably on the milk and other campaigns being waged in Chicago under Health Commissioner Evans. Dr. Porter noted progress in fighting tuberculosis, typhoid, diphtheria and similar diseases, but held that only the skirmishing forces had met, and that much is yet to be done. Cancer, Bright's disease and blood diseases need more attention, while the typhoid death rate is still appalling in places where little or no attention is paid to the water supply.

Dr. Porter held that the life insurance companies could wield a powerful influence for prevention of disease with more than one-half of the population of the country, and outlined a plan of campaign for them to follow through health bureaus and education of policyholders, and co-operative action with local and national authorities.

George E. Ide, President of the Home Life, reported progress for the Life Extension Committee on the question of prevention of disease, though the Committee had been forced to reject some plans proposed for united action. Mr. Ide supported some of the recommendations of Dr. Porter; the Committee recommended the establishment by the Association of a Health Bureau to gather statistics as to what is being done to improve sanitary conditions and prolong life, and that the Officers of the Association lend their support to all such work so far as possible and to a national health bureau.

A paper on "Modern Sanitation," prepared by Dr. Alvah H. Doty, Health Officer of the port of New York, was read by Dr. Knight, of the Metropolitan Life. It dealt with methods of transmission of infectious diseases, showing that clothing transmits little infection, and money does not carry infection, as generally supposed. Dr. Doty held the mosquito is the chief spreader of infection and its extermination is essential.

Infected water and milk transmit disease, especially typhoid, and anyone coming in direct contact with an infected person can transmit disease even though unaffected himself. Dr. Doty also discussed methods of sanitation and disinfection, arguing that they constitute the most effective means of preventing disease, but should be under the control of competent medical officers.

It was resolved that the Association devote its energy toward the adoption of suitable courses of study either in the regular curriculum of vocational schools or in the elective courses, or in the summer schools, or post-graduate work, as will best prepare those men or women, who may make the business of life insurance their life work; and, also, that the Executive Committee be instructed to invite the attention and the consideration of colleges and universities to the advantages to be derived from the introduction of such courses of study as herein outlined.

New York Conference on Milk.

The conference on the milk problem that was held in New York City in December last brought together an audience of some hundreds and a group of speakers, including some of the best authorities from Canada and the several States. The New York Milk Committee itself, which called the meeting and conducted it, has for its chairmen of sub-committees such men as Charles E. North, M.D.; Stephen Francisco, President of the United States National Association of Certified Milk Producers, himself an important milk producer in Jersey, where he has been at work in the attempt to improve the supply through conferences with the farmers and the offer of special prices for clean milk; Dr. George W. Goler, of Rochester, whose name is famous wherever there are discussions on milk; John Spargo, whose writings on the subject are well known; Dr. Henry L. Coit, President of the American Association of Medical Milk Commissions, and Dr. John Amyot, Provincial Bacteriologist of Toronto. The meeting included four sessions: one on "Milk Economics," with Stephen Francisco presiding; one on "Public Milk Supplies and the Public Health," with Professor William T. Sedgwick in the chair; one on "Milk Standards," with Dr. Ernest J. Lederee, Commissioner of Health of New York City, for chairman, and the fourth, on Milk Com-

missioners, with Dr. Coit to care for it.

Dr. John Amyot threw a sort of bombshell into the meeting, when he suggested that he is beginning to doubt the safety of certified milk. He had much to say about the carrying of tuberculous infection and the preventing of such infections. Thirty-five inspectors are too few to do this. One cannot depend upon the local Health Officer to notify about sickness on the farm, and cases have been known where two weeks intervened between the sickness on the farm and the notification to the consumers of the milk.

The radical advocates, however, of the pasteurization of milk and the wholesale tuberculin testing of cattle were defeated in their efforts to capture the Conference. Composed as it was of scientists, producers, dealers, health officials of important cities, both in the United States and Canada, the Conference was considered a most representative one as far as continental opinion is concerned.

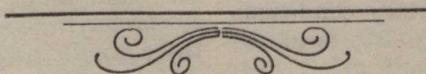
American Civic Association.

The sixth annual meeting of the American Civic Association was held in Washington on December 14-16. A large percentage

of the 2,500 members were present, and questions of much Public Health importance were discussed.

One of the tenets of the Association is that the whole country should be led to join a movement for parks wherever there are people who need them and where human life, animal life and forest life may be conserved. City planning and improvement are other works of the Association; and the Association has demonstrated that cities which have shown the greatest civic improvement have been the cities that have had greatest growth.

The American Civic Association was created in St. Louis, in the days of the Louisiana Purchase Exposition by the union of two existing organizations, the American Park and Outdoor Art Association and American League for Civic Improvement, and since then among other undertakings has fought strongly against the commercialism that would have turned Niagara into a barren cliff. The Association has also taken up the question of such public nuisances as smoke, billboards, injurious insects, and espouses underground wires for electric lines, public comfort stations and garden schools.



Postscript

The business now carried on by R. Score & Son, Limited, at 77 King Street, West, Toronto, Ontario, was established by the late Mr. Richard Score, in 1843. When Mr. R. J. Score succeeded his father in 1862, the firm was known as R. Score & Son, but has recently been incorporated as a limited liability company.

During the 67 years of its successful career, the firm has gained a reputation for fair business dealing, which now extends from coast to coast throughout this wide Dominion. Travelling representatives of the company call on all customers, who reside outside the city, with samples of suitings, overcoatings, etc., as well as a complete and extensive range of samples in haberdashery.

A representative of the firm visits the leading mills in Great Britain semi-annual-

ly, and looks after the buying for the several departments of the business. Consequently there is always to be found in stock a very extensive range of new and up-to-date patterns in imported worsteds, tweeds, serges, etc. In the haberdashery department also are to be found the latest creations in men's furnishings, direct from leading manufacturers in Great Britain and the United States.

* * *

The Rev. John Williams Cavanaugh, president of the Notre Dame University, of Notre Dame, Ind., tells some amusing stories in his talk on "The Educational Philosophy of an Ironmaster." The Rev. Mr. Cavanaugh relates an incident that happened to some little birds whose mother had deserted them. An elephant came along and happened to see the nest. The birds, being young, were unable to fly and told the elephant of their plight, saying they were hungry. The elephant told them not to worry, that he would look after them. Then clumsily sat down on the nest.

"That," says Rev. Cavanaugh, "is what we will do to the unfortunates if we do not wake up to the realization of the fact and help them to become self made."

He also asserts that a father is inhuman when he tells his son that what was good for the father is good enough for the son, and says that possibilities for great men often are shattered with just such advice. He cites the cases of Harry Thaw and his counsel, Martin W. Littleton. Thaw was raised in the lap of luxury. Everything he desired was his and he was not allowed to broaden his mind on the greater problems of life and naturally fell into a life of crime. Littleton was raised on a farm. Everything he got he worked for. He did not know the pleasures of life until he was a grown man and his mind developed into one of great activity.

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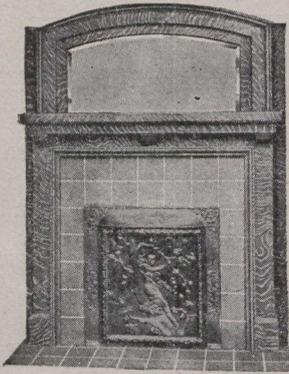
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- TORONTO

That dream of the pan-handler, the free lunch, has been investigated by Health Commissioner F. A. Kroft, of Milwaukee. Dr. Kroft visited two first-class saloons in this city and inspected the lunch counter catering to the trade of the middle classes.

Conditions in all four places were found unwholesome as far as the lunch counter was concerned. Dr. Kroft says:

"I watched the process of men at the counter. One man took up a piece of ham and touched it to his nose. After smelling the ham he decided he did not care for ham. He made an equally careful inspection of other things. Finally he selected cheese and made a sandwich which he ate with evident relish.

"The next man who attracted my attention did not care for a sandwich. He did not even look at the slice of ham rejected by the man with the keen sense of smell, at the cheese or at any of the other things sliced for sandwich-making.

"He seized a fork that stood in a glass of

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dirty water with a number of other forks and went after some of the things that were nearest to him. Pickles, some baked beans and finally some sauerkraut fell under the sweep of his well-handled fork. When he had satisfied his appetite he returned the fork to the glass of dirty water for the next man."

The food, in Dr. Kroft's opinion should be served by some one who could prevent any possibility of spreading disease through the medium. Where food is given away the saloonkeeper cannot afford, we suppose, to furnish free service, too. But conditions should be improved. Perhaps a charge of a penny might be made for lunch. That would not be a hardship on the patron and would provide for a waiter, so food could be served under sanitary conditions.

* * *

Sanitation and hygiene in improving conditions of living in civilized countries have contributed to a steady decrease in infant mortality. This decrease does not apply to the infant population under one year. Gastro-intestinal disease is the largest single factor in determining this larger mortality, and is traceable most directly to improper feeding. This resultant loss of potential wealth should be of careful concern to the whole country. It is obvious that the clean milk crusade is worthy of our best endeavors.

Health is a nation's greatest asset, disease its gravest liability. To fail to protect the health of the community spells a great economic loss. There is probably no subject which has received more general consideration in the past few years than that of conservation, but it is the conservation of the other natural resources which is being discussed by our great public and national bodies. The problem of the conservation of human lives is not attracting much publicity. As a people we love our coal, our gold and our forests more than we value life.

The conservation of human life has been until recently relegated to the what attention provincial and municipal health boards could give.

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Christie Biscuits mean the best ingredients money can buy—all first class table quality—mixed and baked in the Christie scientific way and packed in dust and damp proof tins and packages to assure lasting goodness. You may heartily recommend Christie Biscuits, if you want to recommend the best biscuits on the market—not because we say so, but because the particular housewives of Canada have proved them so.



N.B.--Our Zephyr Cream Sodas crushed in Cream or Fresh Sweet Milk certainly do make a light and nourishing breakfast



CHRISTIE, BROWN & CO., Limited

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Thousands of foreign workingmen in cities are sacrificing their health and happiness through lack of family life, according to statistics gathered by the social investigation department of the Chicago School of Civics and Philanthropy.

Milton B. Hunt of the civic school in an article in the current number of the American Journal of Sociology, issued from the University of Chicago press, tells of discovering a general disregard of sanitary rules in his visits to laborers who have been unable to bring their families to America. Groups of men living on a co-operative basis without a woman housekeeper, he found disregard, overcrowding, ventilation and lighting while the feminine touch results in closer attention to the health laws.

* * *

The latest proposal as to road-making is that convex roads are a mistake, and that concavity is the correct shape for roads. The following advantages are claimed:—1. In the concave roads there would be no mud near the pavement. 2. A concave road would enable slow traffic to keep to the highest and, therefore, to the easiest part of the road, for the horse to pull its load. 3. In a concave street one drain would serve instead of two, with one set of gratings, and one system of connecting sewers, with the main sewers beneath. 4. The mud and dust will be swept to the centre of the road, instead of to the sides near the doors of the shops and dwellings, and the pavements, where foot passengers pass. There seems little chance of this being adopted in the practical civic world for some time to come; but road engineers might keep it in view in case some model city should be projected.

* * *

Street railways of Germany have adopted a ridiculously simple device which appeals to every stranger. The different lines in a city are designated by numbers and not by street names as in America. You inquire of the police for a line to a certain street and you are told to take "No. 4." You look for No. 4 and you can't miss it, for it looms large on the front of your car. That number on the cars is so plain that you see nothing else for the time being.

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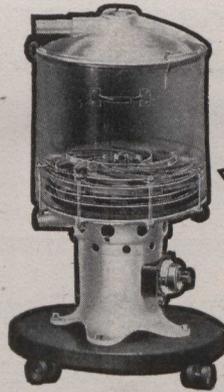
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"The Inhibitory Action of Listerine," a 128-page pamphlet descriptive of the antiseptic and indicating its utility in medical, surgical and dental practice, may be had upon application to the manufacturers, Lambert Pharmaceutical Co., Saint Louis, Missouri but the best advertisement of Listerine is.....

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Paris, France, has too many doctors, and a syndicate has been formed for self-protection in the medical profession.

There are now 4,165 doctors in Paris, as against 2,150 in 1881; that is to say, in the last thirty years the number of doctors has doubled and the population of the town has, to all intents and purposes, remained at a standstill, so that medical earnings have been reduced by one half.

The doctors' syndicate which has recently been formed desires to make medical examinations more difficult. Many Paris doctors now work for starvation fees, and have to accept small fixed annual salaries for attendance on the employees of large firms.

The syndicate maintains that this system is not only prejudicial to the doctors who work under it, but that it takes fees away which would otherwise come to other members of the profession. A proposal is made to limit the number of medical students in the schools. As matters now are, numbers of the students never receive proper medical education because there is no room for them.

* * *

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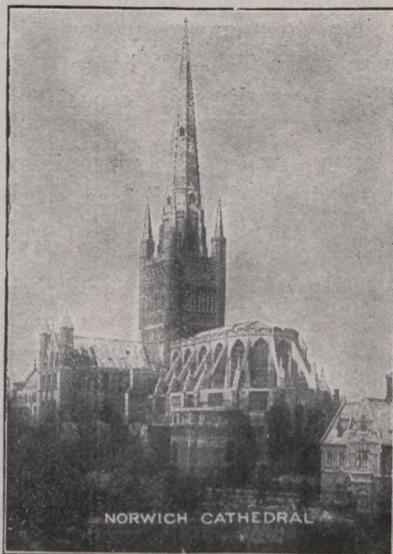
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Don't put anything but food and drink in your mouth.

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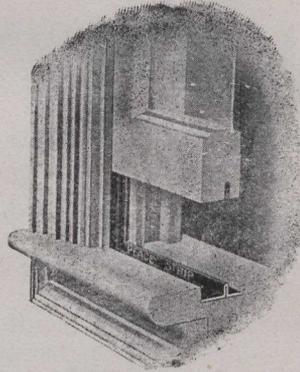
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An Opinion on Milk.—Showing that clean milk and milk with low bacterial count can be produced by following its rules, a statement issued by the New Orleans Milk Commission recently embraces the following findings:

1. That climatic conditions do not interfere with the production of clean milk with a low bacterial count.

2. That the exposed aerators in common use should be discarded, in that they are a source of contamination and do not cool efficiently, but the milk should be cooled by the submersion of the milk can in a tub of ice water.

3. That the ordinary barn, even though poorly constructed, can at small cost be placed in good condition.

4. That the labor available, though ignorant, can be taught to use and made to continue using, the ordinary precautions necessary to produce clean milk.

* * *

Motor Cars and Sanitation: That sanitary conditions would be benefited by a more extended use of the motor car is shown in statistics which credit the cities of America with using 4,500,000 horses and 200,000 mules.

With all the precautions possible to keep cities sanitary, little progress can be made so long as such an army of quadrupeds parade in endless procession up and down the streets. The clouds of dust which sift above the pavements are not the clean earth of the field. The expulsion of the horse would mean the disappearance of the horse fly by removing its chief breeding source.

* * *

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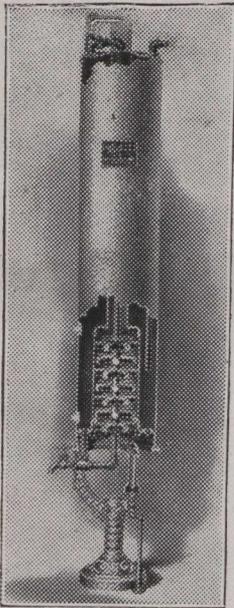
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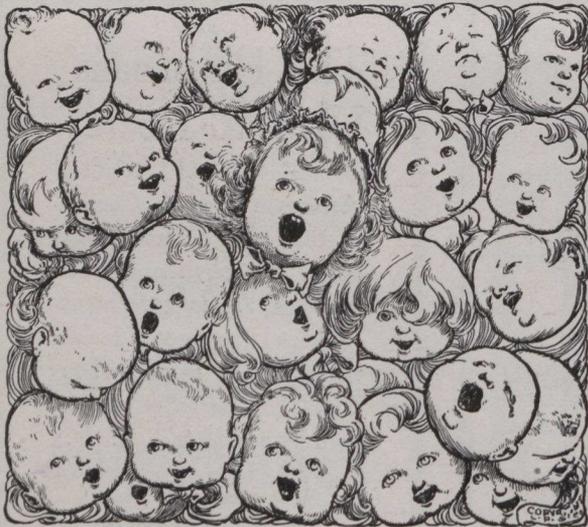
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Price—4 City Dairy tickets per
 quart, delivered packed in ice.

Telephone your orders **2040**
 to College.

A Departure in Eating: If you want to be healthy do not sit down after meals. Stand up, or, better still, walk about gently. In fact, eat your meals standing up.

Do not, however, run, walk fast, or take violent exercise.

This advice was given by a well-known London physician.

“The stomach is so arranged,” he says, “that when you are sitting down there is a tendency for the food not to go through the proper processes nor move along in the proper path.

“The result is that it stays in that part of the alimentary system where the first processes of digestion take place, and, consequently, it is inefficiently dealt with. So improper nutrition, occurs, and the blood, nerves, muscles and brain are not fed as they should be.

“The city man, who takes his lunch standing, and then goes quietly on with his work afterwards—not hurrying too much for half an hour or so after he has eaten—does the right thing.

“When one stands up the digestive system is better able to deal with the food effectively.

“The food, in fact, goes to the right departments of the human factory in good time and order, and the very best results are got out of it.

“Again, when you are sitting down the blood supply is not so good. The circulation of it is not so efficient, and naturally it cannot absorb the manufactured food so well.

“A little movement after meals is therefore wise, and the eating of them standing is wiser still. There is this, too: If you sit down to your meals and linger over them you eat too much, but if you are standing up you do not eat after your hunger is satisfied, and so you save your food factory from overwork.

“If, however, you have any tendency to apoplexy, sit at your meals and keep still after them.”

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Reconstructed Smith Premier Typewriter

NO. 2 AND NO. 4 MODEL
\$45.00 Will do work
equal to a new
machine and guaranteed for
one year. ∴ ∴ ∴ ∴

*National Typewriter
Company, Limited*
78 Victoria Street - Toronto



Made in two
sizes 25 and
50 Cents.

Sold by all
Druggists.

None other
so simple.

None other
so efficient.

It chases
Flies.

DE PREE'S FORMALDEHYDE FUMIGATOR

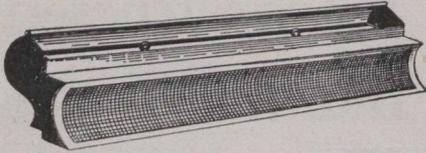
(GENERATES FORMALDEHYDE GAS)

HENRY A. ROWLAND

EXCLUSIVE CANADIAN DISTRIBUTOR

Cor. Gerrard and Parliament Sts., TORONTO, CAN.

NATURAL VENTILATION



Patented 1909-1910

Sold by the Inch

WILL FIT ANY WINDOW
HEALTH IS WEALTH

The Universal No-Draught Ventilator

Recommended by Physicians. Lots of Fresh Air and no Draughts. Keeps out rain and dust. Can be used in offices, hotels, schools, etc. Should be used in every sleeping apartment, workshop and factory. Call and inspect or write for further information.

The Universal No-Draught Ventilating Company

30 Adelaide Street - TORONTO, CAN.

"Plea for the Australian Child Body: Dr. Elkington, Commissioner of Public Health, Queensland, and formerly Chief Health Officer, Tasmania, has brought forward strong evidence as to the need for medical inspection and treatment among children of that highly favored land. "Tasmanian Children," writes Dr. Elkington, in his "Plea for the Australian Child Body," "are as healthy-looking as any other young Australians; they show as good a proportion of chubby red cheeks, and sturdy limbs and bodies, as would be found anywhere else. Probably they are as healthy and sound as their brothers and sisters in any other State. Yet, out of 11,287 children examined, 4,158, or 36.83 per cent., were found to be physically defective to an extent which was either actively interfering with their educational progress, or would, in all human probability, so interfere with it in the near future. This estimate was arrived at on no arbitrary basis, but from the independent and closely checked observations of three specially skilled medical officers working on a definite system with definite and lenient standards.

* * *

Dr. A. H. White of Detroit has been testing the air in the street cars of that city to obtain evidence in the city's suit against the Street Railway Company for lack of ventilation. His method is to fill two bottles with water to keep the air out of them, and when he gets inside a car he pours the water into a pail. The bottles take a portion of the car air and are then carefully sealed. The bottled air is later tested to find its proportion of carbonic acid; the carbonic acid being an indication of the measure of pollution caused by the breath of the passengers.

The lack of ventilation in foul and stifling street cars is no small matter in the winter months when the restriction of oxygen lowers the vitality and leaves the human system vulnerable to every epidemic that preys. The vitiating effects of bad air thus breathed, even for ten minutes, cannot be overestimated. Colds and all infectious diseases of the air passages may be attributed to these temporary exposures to foul and vitiated air. Toronto street

March's Thesaurus

Designed to suggest immediately any desired word or phrase needed to express exactly a given idea

By FRANCIS ANDREW MARCH LL.D., L.H.D., D.C.L. Litt.D.

The FOUR Great Cardinal Points of March's Thesaurus

- FIRST. It supplies you with the word that memory fails to recall to exactly express an idea.
- SECOND. It finds the missing word — the word you do not know — to precisely express any thought that you may have in mind.
- THIRD. It extends knowledge and creates new ideas by grouping all related words and their meanings that express thought on any subject.
- FOURTH. It gives one absolute and almost immediate command of the entire English language.

NOTHING LIKE IT IN THE WORLD

T. J. FORD & CO'Y

303 CHURCH STREET - TORONTO, CANADA

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cars are a case in point.

To declare that cold street cars do not constitute a menace to health is to fly in the face of common sense and enlightened hygiene. A warm car need not necessarily be poorly ventilated. Neither need it be unhygienic, provided it is properly cleaned at the car barns. It is equally true that a cold car is not necessarily healthful. Germs of certain malignant diseases live, move about and have their being in temperatures uncomfortably low. There is something to be said further, for the workers who leave a warm store or factory, tired out after their day's work, and who are compelled to sit in a dirty car the temperature of which hovers near the freezing point. A ride of half an hour in such a vehicle virtually amounts to perilous exposure.

* * *

If the excessive use of false switches, curls, rolls, rats and coiffeurs is continued, the next generation of women will commence life with little or no hair at all. Within the last five years, since modern false hair sprung into sudden prominence, the tendency to baldness in women has steadily increased.

The women who spend most of their days motoring or playing golf stand less of a chance of suffering the consequence of choking up their scalps with wads of false hair, for they have the benefit of the fresh air.

But the office workers and girls who work in stuffy stores all day must soon find their hair falling away if they continue to hamper its healthy growth by weighting down the scalp so the circulation is stopped.

Special

Morning Coat and Vest - \$25.00
Frock Coat and Vest - \$33.00

GUINEA TROUSERS

\$5.25 spot Cash.

R. SCORE & SON, Limited

76 King St. W., Toronto, Ontario

"THE HOUSE THAT QUALITY BUILT"

WHEN SENDING
MONEY BY MAIL
USE
Dominion Express Co.

MONEY ORDERS
AND
FOREIGN DRAFTS

The safest, cheapest and most convenient
method of remitting money to
ANY PART OF THE WORLD

If lost, stolen or delayed in the mails, your
money will be refunded or a new order
issued without further charge.

MONEY TRANSFERRED
BY
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TRAVELLER'S CHEQUES ISSUED

AGENCIES THROUGHOUT CANADA

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119 West King Street

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Watering vs. Oiling Roads

WATERING the road keeps down the dust so long as the moisture remains, but the constant application of water washes away the valuable binding material, thus destroying the road and making repairs necessary.

OILING the road eliminates the dust, hardens and makes the road practically waterproof, retaining the precious binding material on the road, where it belongs, thus extending the life of the road and cutting out largely the cost of repairs.

WATERING the road means, in any case, that all night long and all day Sunday the disease-laden dust is blown about, causing eye, throat and tubercular troubles, as well as destroying lawns, shrubbery, fruit, furnishings, merchandise, etc.

OILING the road means that there is no dust to blow at any time. The original dust is disinfected by the oil and worked into the road, thus making it wholesome and sanitary to live or travel upon a properly oiled road.

WATERING the road means expending large sums of money without receiving permanent benefit.

OILING the road means that it actually costs 25 per cent. less than watering, according to the experience in Toronto, and every gallon of oil used makes the road permanently better. It is like "having your cake and eating it."

WATERING the road attracts flies and mosquitoes.

OILING the road, with Vulcan Road Oil, drives away all insects and makes life worth living for man and beast.

Why pay immense sums for good roads and then let them go to pieces for lack of oiling? Every road—new or old—should be oiled regularly to keep it in repair. The amount of oil required to be used depends largely upon the condition of the road; where dust is not removed it means more oil, especially at first. The experience on city streets in Toronto after one or two good treatments, is that a mile in length of road by width of sprinkler (14 to 16 feet), takes about 700 gallons, on the average, each application. It is generally applied four to six times a season, but this is largely governed by local conditions. It can be used in an ordinary watering cart or hand sprinkler.

The undernoted can be had only from us:

- (1) **VULCAN ROAD OIL**, sanitary, effective, applied by sprinkling. (2) **VULCAN PARKWAYS OIL**, special quality, odorless, for sprinkling walks, drives and private roads. (3) **VULCAN FLUID ASPHALT**, spread on hot once a season only, will eliminate dust and help to make and keep the road solid.

CORRESPONDENCE INVITED.

The BRITISH AMERICAN OIL CO., Limited
REFINERS, TORONTO

Branches: Montreal and Ottawa.

Makers famous "Vulcan" brand Oils and Greases.

We Make THAT GOOD OIL

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THE BETTER WAY

To Overcome the Dangers of Earth Burial

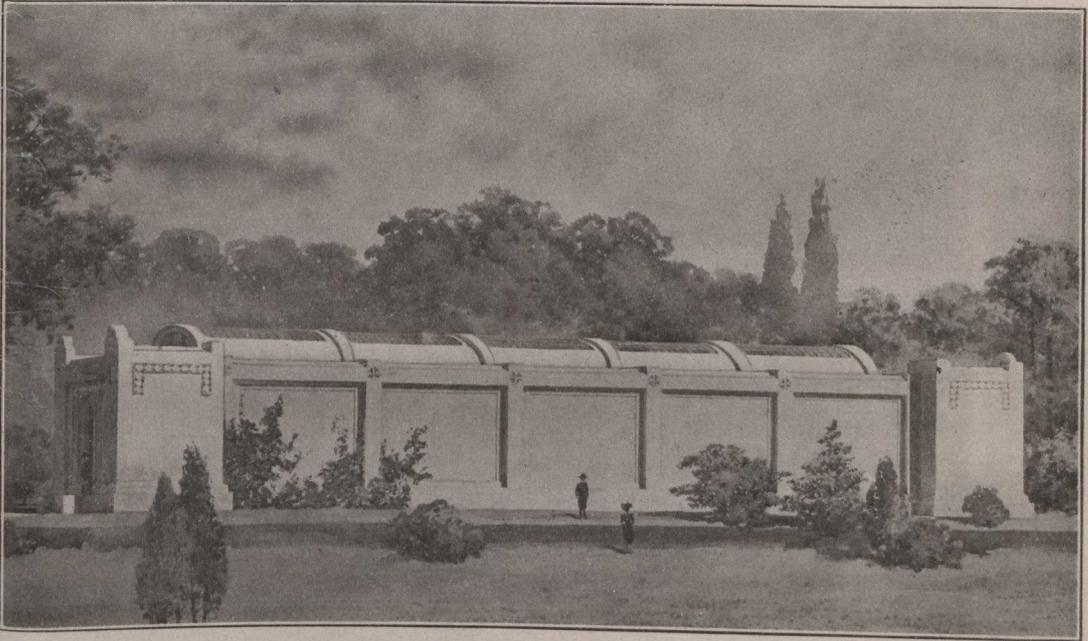
Beautiful Palaces of Reinforced Concrete Construction—Lasting as the Pyramids—
Airtight Compartments Equipped with Sanitary Disinfecting Apparatus—
Finished with Pure White Marble Interiors—Substantial Granite Outside Walls.

International Mausoleum Co. Ltd.

CAPITAL \$500,000

42 and 44 Victoria St. - - Toronto, Canada.

"House of Many Mansions"



Proposed Grand Compartment Mausoleum, Toronto, Ont. 1,000 to 1,500 Compartments.

The above Company controls the rights to build these structures throughout the Dominion of Canada.

Eastern Mausoleum Company

CAPITAL \$10,000,000

494 Ellicott Square - Buffalo, New York

Has been recently organised to construct similar buildings
in the New England States, New York and New Jersey.

Full Particulars Furnished on Application to Either Company.

The Dustless Home



Santo Vacuum Cleaner

THE MODERN CLEANING SYSTEM

The *Keller-Santo* Vacuum Cleaner makes absolute cleanliness possible. Every particle of dust can be removed without 'raising' a particle. So necessary is this sanitary, thorough dust removal that no home can be considered "modern" in its equipment until a vacuum cleaner is put to work.

The *Keller-Santo* is large enough to

do thoroughly the cleaning for the largest home, and with a few extra attachments will serve the needs of hospitals, churches and other semi-public buildings.

SOME OF ITS GOOD POINTS. A perfect motor that will not give trouble nor overload your wires: a strict conformity to the limits set by the Insurance Underwriters. It is portable—can be carried as handily as a pail of coal; will last easily 15 or 20 years.

Keller-Santo Vacuum Cleaner
equipped to suit your current **\$135.00**

THE T. EATON CO LIMITED
TORONTO - CANADA