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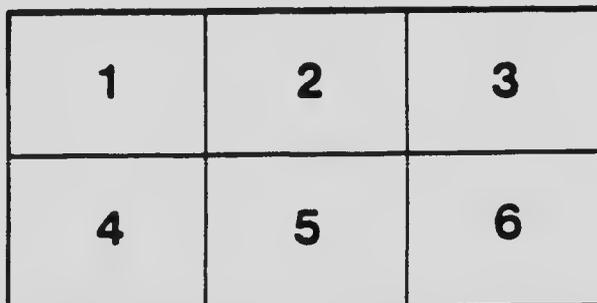
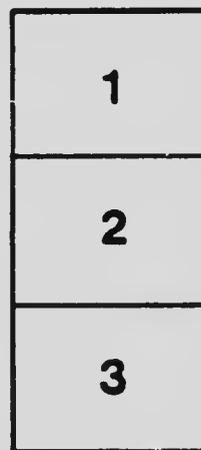
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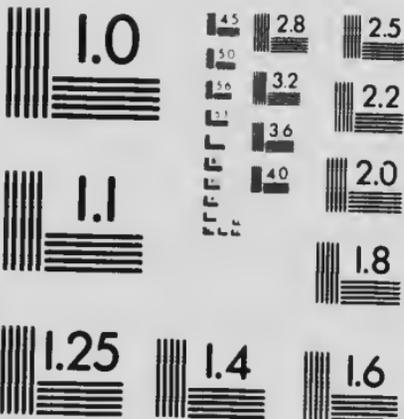
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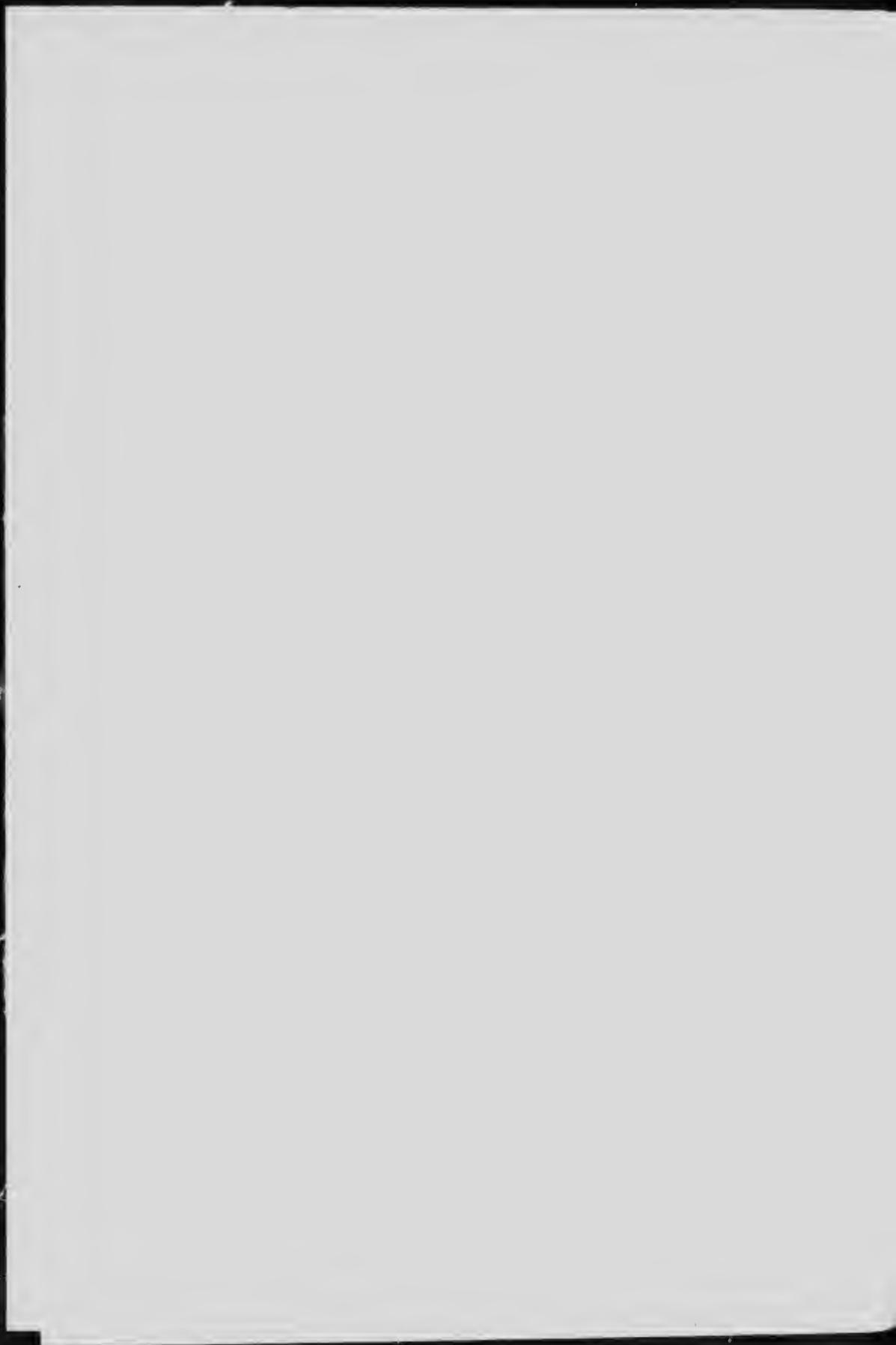
The Anti-Tuberculosis League

The Board of Lady Broom

ADWA-INDIA

1911

W. R. Fraser



CONSUMPTION:

Its Cause, Prevention, and Cure.

GEORGE H. COX, M.D., *Literary Editor.*

JOHN W. MACLEOD, *Business Editor.*

ISSUED BY

THE ANTI-TUBERCULOSIS LEAGUES

OF

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NOVA SCOTIA.

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"Health measures adopted to prevent tuberculosis will prevent other diseases as well."—Board of Health, Salem, Mass.

Directory of the Anti-Tuberculosis Organizations in Cape Breton Island in affiliation with the Canadian Association for the Prevention of Tuberculosis.

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"To combat consumption as a disease of the masses requires the combined action of a wise government, well-trained physicians, and an intelligent people." *Knapf*

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- Dr. E. M. MacDonald, Sydney.
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- Dr. W. L. LeBlanc, Eastern Harbour.
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- Dr. D. T. MacMaster, Inverness.
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- Dr. J. A. Proudfoot, Inverness.

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- Dr. A. A. LeBlanc, Arichat.
- Dr. B. A. LeBlanc, Arichat.
- Dr. F. G. MacAskill, St. Peter's.
- Dr. J. MacDonald, St. Peter's.
- Dr. J. A. MacDonald, St. Peter's.

VICTORIA COUNTY.

- Dr. J. L. Bethune, Baddeck.
- Dr. D. A. MacAulay, North Harbour.
- Dr. D. MacDonald, Baddeck.
- Dr. J. A. MacIver, Baddeck.

"Medical science cannot cope alone and unaided with this difficult and prodigious world problem. Many forces—economic, legislative, sociological, humanitarian—must be enlisted." *H. G. Wells*



*With every good wish for the success of the great
work undertaken by the Antituberculosis
League of Nova Scotia & L. Trudeau*

"For the fundamental change in the method of treatment of pulmonary tuberculosis and in the results obtained, with all that it involves, directly and indirectly; for the change in the outlook in many cases from despair to a hopeful confidence; for the establishment of hundreds of clinics and sanatoria throughout the country; for the approaching universal adoption of the open-air method of treatment for the sick, and the open-air life for the well, Trudeau's work is responsible to a greater extent than that of any other man or than that of any group of men in America. Tens of thousands of persons owe their health and their lives to his strong and beneficent personality." *Dr. H. M. Riggs,*

FOREWORD.

WHAT is this little book? It is an honest, earnest effort to put into simple non-technical words the latest scientific teaching respecting tuberculosis, its nature, its causes, and the best means of its prevention. It is plain talk for the people, young and old. It is addressed more particularly to the people of the seven eastern counties of Nova Scotia, but it is believed that it will prove useful and interesting to such of the people of these eastern provinces as are not already well informed on the subject with which it deals.

The need of adopting practical and vigorous measures to combat the "Great White Plague" in Eastern Nova Scotia has been keenly felt for many years by the most thoughtful among us. While our physicians individually have done a great deal to diffuse information regarding tuberculosis, it was not possible for them without united and concerted action to reach the whole body of the people, and consequently their laudable efforts were successful only in the isolated cases—comparatively few—to which they happened to be able to give personal attention. Our medical men—to their credit be it said—have been unanimous and outspoken in urging the organization of an active and comprehensive campaign against tuberculosis that should reach every hamlet and every house in what I may call the constituency of the movement.

On the 18th of November, 1909, with the purpose of forming an organization having for its object the curing of every case of curable tuberculosis and the prevention of the further spread of the disease in the counties of Pictou, Antigonish, and Guysborough, the medical men of these counties, acting in conjunction with the University of St. Francis Xavier's College, held a meeting in New Glasgow, in the county of Pictou. At that meeting the Tri-County Anti-Tuberculosis League was formed, and at once began its campaign.

The progress of the movement has been satisfactory, almost indeed phenomenal. As soon as our University brought the matter before the medical men of Cape Breton, they took hold of it with commendable enthusiasm such as one would expect from so enlightened and public-spirited a body of men.

It was fortunate that the well-known lecturer, Dr. George Dana Porter, Ottawa, Secretary of the Canadian Association for the Prevention

of Tuberculosis, was induced at the inception of the movement to come to Nova Scotia and address large meetings in almost every town within our district. His many thoughtful addresses, in which he explained in popular language the character and the dangers of Tuberculosis, have done much to arouse the public mind to the necessity of ascertaining and applying the best methods of prevention and cure.

The plan of campaign approved at the New Glasgow meeting was as follows:—

1. The members of the medical profession belonging to the League undertook to put into popular form the latest and best literature on the subject.

2. The University undertook to publish this literature in book form and to finance its publication and distribution.

How excellently well the doctors have done their part will be clear to every person of intelligence who reads the following pages. The arduous task of compiling the literature, compressing it, simplifying it, and preparing it for the press was entrusted to Dr. G. H. Cox, of New Glasgow, one of the most learned and successful of the many excellent physicians in this country. Great credit is also due to Professor John W. MacLeod, of the teaching staff of this University, whose devoted zeal, energy and business ability rendered the financing of this publication comparatively easy.

I have only to add that this work has been undertaken and carried on from purely philanthropic motives. Those taking part in it have given their time and labour freely and cheerfully, thinking themselves well repaid if they contribute in any degree to the alleviation of suffering and the betterment of social conditions.

H. P. MacPherson

President,

University of St. Francis Xavier's College.

ANTIGONISH, NOVA SCOTIA,

March, 1912.

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"The great work of sanitary reform has been, perhaps, the noblest legislative achievement of our age, and, if measured by the suffering it has diminished, has probably done far more for the real happiness of mankind than all the many questions that make and unmake ministries" *Lecky*.

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"This is the great urgent sanitary problem of the new century. In no other direction can such large results be achieved so certainly and at such relatively small cost."—Huber.

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CHAPTER I.

Introductory.

THIS booklet is published by the Anti-Tuberculosis Leagues of the Island of Cape Breton organized through the combined effort of the University of St. Francis Xavier's College and the Physicians of the Island. An edition of 26,000 copies is being distributed gratis, and it is the intention of the Leagues that a copy shall be placed in the hands of every family in the Island. The Leagues have been enabled to carry out this project by the generous support of the members of the mercantile community who have taken advantage of the advertising columns and by the assistance of grants from the Councils of the Counties of Cape Breton, Inverness, Victoria and Richmond, the City of Sydney and the towns of Glace Bay, Sydney Mines, North Sydney, Dominion, Inverness, Port Hood, Louisburg and Port Hawkesbury. The funds thus obtained have been augmented by the liberality of Lord Strathcona, whose donation has finally made possible the publication of an edition large enough to meet the requirements of the increased population of the Island.

We ask the public to accept this booklet as a humble attempt at the betterment of our social conditions, to read it carefully and to preserve it for the use of others, to ponder its meaning, and, above all, to stand ready to assist us in the work in which we are engaged, and in which we feel hopeful of accomplishing a useful end.

If an excuse were needed for our efforts at bringing the subject before the public, we feel that such is afforded in the awful magnitude of the evil wrought by tuberculosis, and we trust that the pages that follow will do something towards arousing and sustaining interest and effort on the part of all who read them. The fight against tuberculosis, to be successful, requires above all things co-operation. The nature of the disease, the manner, means and extent of its dissemination are such that it is only by the united action of governmental authorities, of the medical profession, of teachers and leaders of the people, and what is more important still of an enlightened and interested community, that the combat can be successfully waged. It is for this reason that we make our appeal directly and personally to every individual to whom these pages come; we call upon every reader, man or woman or child, to enlist themselves at once in the fight against the Great White Plague. Read this booklet and you will realize that the two great forces against which we have to contend, the two great allies of tuberculosis, are ignorance and apathy. For the existence of the former there is now but little excuse; and for the latter, none whatever.

Surely as men, and women, and children of a people that prides itself on being intelligent, we should not hesitate to heed the call that has aroused the whole civilized world to action. Every one of us knows that the danger of acquiring tuberculosis hangs over us all; the enemy



LORD LISTER.

*Born 1827.**Died 1912.*

The Father of Antiseptic Surgery, and the greatest benefactor of suffering humanity throughout the world.

"Measure as you may the progress of the world—materially, in the advance of steam, electricity and the other material appliances; sociologically, in the great improvements in the conditions of life; intellectually, in the diffusion of education; morally, in the possibility of higher standards of ethics—there is no one measure which can compare with the decrease in physical suffering in man, woman and child when stricken by disease and accident."—*Dr. William Osler.*

is always at our gates. The dead and dying, the suffering and the crippled,—the victims of tuberculosis fill our cemeteries or walk amongst us as living witnesses of the ever-present pestilence.

We *know* their numbers can be curtailed; we *know* that if every individual in the community does his or her duty, consumption can be made to become an uncommon disease instead of being as it is now the most frequent single cause of death among us.

The compilers of this booklet have tried to keep in sight the necessity of using plain and straightforward language, and technical terms have been avoided where possible. To have written a complete treatise on the subject would have been neither feasible nor useful, but the endeavour has been made to set forth here such a sketch of the nature and causes of the disease and the methods of combating it as seems useful towards arousing intelligent action and guiding united effort. Three ideas are held in view in the preparation of this work, all leading to the one object, the extinction, or at least the abating, of the tuberculosis evil within our bounds; *first*, the teaching of the public and the reiteration of the lesson until it becomes part of our fundamental, everyday beliefs, that tuberculosis is largely preventable; *secondly*, the setting forth of the means by which the disease is spread and the method by which we can control it; *thirdly*, the preaching of the doctrines of healthy living in general, leading in particular to the safeguarding of the individual against this especial scourge. In other words, we seek not alone to cure the sick and to keep them from spreading the disease, but to teach our people how, by raising the general standard of their health and sedulously maintaining it, they may become virtually immune from tuberculosis.

Incidentally a few pages have been included dealing with the two subjects of the Care of the Teeth and of the Dangers of the House-fly, both of which we believe will be appreciated as bearing upon the general purpose of the booklet.

A word of warning may not be out of place at this point, although a perusal of the following pages will render it needless, against an unwarranted dread of personal contact with those who suffer from the disease.

An unfortunate result of the increase of popular knowledge of tuberculosis has been the development among unthinking people of an hysterical fear, leading in some cases to harsh and cruel treatment of the poor victims of consumption. A true conception of the facts of the cases as set forth in the following chapters will, we hope, tend to prevent the occurrence of such a state of affairs. The clean and careful consumptive is not dangerous; the careless or ignorant or helpless consumptive is a menace to his neighbours.

In compiling these pages free use has been made of a countless number of books and pamphlets on the subject. Help has been given by many other workers in the field to whom, since it is impossible to

thank them all by name, we desire to offer a general expression of gratitude. Especially, however, are we indebted to the ready and courteous assistance of Dr. Livingston Farrand, Dr. Thomas Spees Carrington and Dr. Philip P. Jacobs, secretary and assistant secretaries of the United States National Association for the Study and Prevention of Tuberculosis, as well as to Dr. George Dana Porter, secretary of the Canadian Association for the Prevention of Tuberculosis. Dr. Carrington has prepared an article for this publication on the subject of Building a Sanatorium, and in many other ways has given us the benefit of his wide knowledge and experience.

The Editors wish to return thanks to the gentlemen of the newspaper press for the ever-ready aid of their valuable columns; to Messrs. M. J. T. MacNeil, T. M. Phalen, and James MacKinnon, Inspectors of Public Schools, and to the public school teachers also who exhibited their interest in the work by responding to the request for local statistics; to Mr. E. J. Seeley, Superintendent at Halifax of the Metropolitan Life Insurance Company, and to the Kny-Scheerer Company of New York, for the gift of a number of cuts; to Mr. A. O. Philip, Manager of the Bank of Nova Scotia at Antigonish, and to the institution he represents, for the free use of banking facilities in connection with the financing of this publication; to **Messrs. Furness, Withy & Co., Ltd.**, for transportation of the 26,000 edition from London to Halifax at half the regular freight rate.

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the scheme and for the practical energy and sympathy he has continuously devoted to its furtherance.

The members of the medical profession have given the utmost encouragement to the labours of the Editors, as might be expected from men whose everyday labours are devoted to the struggle with disease. The present is not the first publication on this subject with which they have been associated; for as far back as 1899 the Pictou County Medical Society had printed and distributed some thousands of copies of a circular dealing with the infectiousness and preventability of consumption. That it bore good fruit is the grateful belief of the Society, for it proved to be the means of arousing a great deal of attention and of provoking public discussion. Following the lead of this Society other associations throughout the province successfully inaugurated similar work. The public seemed to appreciate the effort and to accept the ideas in an intelligent way. For example, it was noted that, following this first publication, repeated inquiries were made of local physicians as to whether it were wise to move into certain houses wherein patients had previously lived who had consumption, and as to the best means of disinfection. There is good reason to believe that this and similar work done in this county during the last decade has helped to bring about the result that the death rate from tuberculosis in Pictou County, according to the Provincial Report on Vital Statistics was for the past year the second lowest among the counties of Nova Scotia.

Finally, the Editors personally wish to ask the public for whom it was intended indulgence for the manifold faults of this little work. The difficulties in their way have been many, the labour not altogether light, but their chief plea for forgiveness is that it was at any rate a labour of love and that zeal and endeavour at least were not lacking.

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(Public Health Act of N.S., Section 49(a). See p. 75 of this book.)

Municipality of Cape Breton	\$200	Town of Dominion	\$75
Municipality of Inverness	\$200	Municipality of Richmond	\$50
City of Sydney	\$200	Town of Inverness	\$50
Town of Glace Bay	\$200	Town of Port Hood	\$50
Municipality of Victoria	\$100	Town of Louisburg	\$25
Town of North Sydney	\$100	Town of Port Hawkesbury	\$20
Town of Sydney Mines	\$100		
Advertising Patrons			\$1,531

"It is essential that a very close co-operation must be established between voluntary action and government and municipal efforts, in order that the spread of the disease can be controlled, and proper means provided for the treatment and cure of those afflicted."—*Dr. Ross, Liverpool.*



LOUIS PASTEUR.

*Born 1822.**Died 1895.*

His discoveries in connection with germ-life made him one of the greatest benefactors of mankind.

"The great fundamental advance is the lifting of this whole class of fateful germ diseases out of the region of the intangible and mysterious, and their establishment, on the basis of positive experimental research, into the domain of the comprehensible and definite. The things which cause them are no longer for us mysterious emanations from the sick, or incorporate expressions of malign forces against which conjurations or prayers could alone promise protection. But they are particular beings, never self-engendered, never evolved in the body, always entering from without—things which we can see and handle and kill."—*Prudden.*

CHAPTER II.

Prevalence and Importance of Tuberculosis.

TUBERCULOSIS causes more deaths than any other disease that afflicts the human race. It kills more people than war, famine, or any of the raging plagues or pestilences that startle our imaginations by their fearful ravages. It is the most widespread of all fatal diseases; no country is free from it, no age exempt, no class of society immune. Such, briefly and imperfectly put, is the case against tuberculosis. Let us see what these words signify when translated into terms of everyday life.

Reliable statistics prove that throughout the civilized world one death in every six or seven is caused by tuberculosis in one form or another — tuberculosis of the lungs, commonly called consumption (phthisis), tuberculosis of the various joints and bones, popularly known as, for example, Pott's disease of the spine, hip-joint disease, white swelling of the knee or wrists or ankle, etc.; tuberculosis of the skin, of the glands, of the membranes of the brain, or of the bowels, kidneys, throat, or other parts of the body. Every year a million people and more meet their death from this disease; every day of the year three thousand victims fall. In Great Britain alone the average yearly toll is 58,000; and in the United States over 150,000. In the Dominion of Canada the harvest numbers at least 10,000; in the city of Montreal alone over 1,000. Of the seven and a half millions of inhabitants living in Canada to-day, a million are doomed to die of consumption, if things go on as they are. To bring our statistics more closely home to our readers, let us see what these figures mean when applied to our own immediate neighbourhood. A careful estimate leads to the conclusion that in the four counties of the Island of Cape Breton there die every year an average of about 250 people from one form or another of tuberculosis. For example, referring to the last decennial census, 1901, we find the number of deaths from tuberculosis in Cape Breton County, 70; in Inverness County, 50; in Richmond County, 32; and in Victoria, 24; in all 176. During the same year the total number of deaths from all causes in the same counties was 554, 407, 185 and 148 respectively; a total of 1,294.

The returns of vital statistics to the Provincial Registrar for the year 1900, as published in that officer's annual report, furnish us still more completely with an accurate knowledge of the distressing facts.

This is the first full year's report published by that official, and one cannot but feel that the value and importance of the information which it affords justify the existence of the bureau of which he is the

head. Let us briefly summarize the facts it sets forth. In Nova Scotia there died of consumption of the lungs (phthisis) alone in the twelve months reported upon 922 persons in all, out of a total number of deaths in the Province of 6,978, a percentage of 13.2. In addition to these, 68 deaths occurred from tuberculosis of other organs, bringing the total up to 990. Still further there were reported 77 deaths from meningitis of children under 5 years and seven of peritonitis. Of these the great majority were undoubtedly tubercular. So that we had at the most conservative calculation a total loss of approximately 1,050 lives in our Province from tuberculosis alone during the twelve months. Fifteen per cent. of all the deaths were from this cause. In every single county in the Province it killed more people than any other one disease.

Of the victims of phthisis 511 were of the female sex, and 411 of the male. Mark, too, these figures—of the total of 922, 288 victims were of the ages of 20 to 29, almost a third; 550 were between 15 and 40, and 659 were between 15 and 50. Three hundred and eighty-two were married.

Let us look at the statistics for our four counties. From consumption there died in Cape Breton County, 121; in Inverness, 56; in Richmond, 27; in Victoria, 19; a total of 223, of whom 86 were married, and 66 were between 20 and 29 years of age. The total number of deaths from all diseases was in the four counties 1,628, so that consumption of the lungs accounted for almost 14 per cent. These figures do not include deaths from tuberculosis in other forms.

The Registrar ends his reference to tuberculosis with the following words: "It will be seen that the campaign recently instituted in this Province to combat the ravages of tuberculosis is amply justified by the facts herewith presented. No one who has at heart the well-being of the Province can view the present condition with equanimity. The fact that upwards of 300 men from the ages of 15 to 60 were cut off by this disease, in many cases leaving helpless families, causes a loss to the Province and distress to individuals that call loudly for energetic remedial measures."

It is but too true that the mere arithmetic of these statistics does not tell the whole tale. The numbering of the deaths is not the whole story. Death is neither "the be all, nor the end all" of the evil workings of the Great White Plague.

For every one consumptive who dies in any given year many times that number exist as living victims of the disease, leading a life of suffering and distress, and many a needed worker is forced to be idle, unable to earn a livelihood for himself and those dependent on him.

There is thus a triple toll exacted of death, of suffering, and of economic loss. Even looked at coldly from this last standpoint alone, the purely economic one, the results when summed up are appalling. It is a sad fact that consumption attacks particularly the young man in the prime of life, or the young woman in the years of her early motherhood. It selects its victims most greedily at the most valuable time of their lives, when they are actively productive as workers, when their labours are worth the most to themselves and to the

world. Of all deaths between the ages of 20 and 45 nearly a third are due to tuberculosis.

It is difficult to express in exact monetary terms the loss to the community from this disease, but its magnitude can be readily appreciated. Reckon in the bill the loss to the individual in earnings during the months or years of invalidism. Add, too, the cost of education and rearing of children who die of this disease before they reach the age of usefulness as workers. Add the loss of savings which melt away in the course of the long struggle against the so frequent fatal termination, and the cost to the community in caring for the sick and helpless.

A careful and conservative estimate at a low average valuation of the human life from the industrial standpoint leads to the calculation of \$3,000,000 as the yearly economic loss to Nova Scotia alone through consumption.

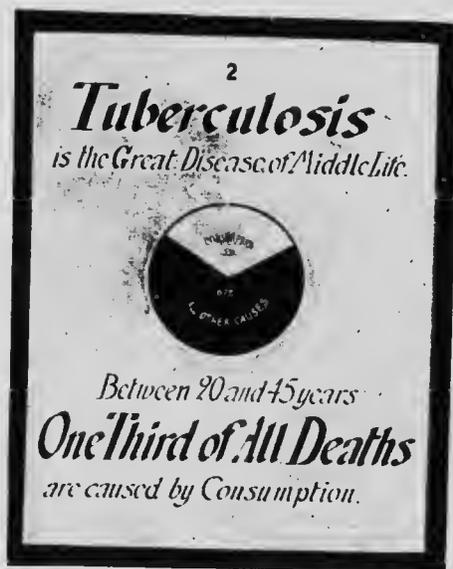
A striking lesson as to the economic influence of this disease is taught us by the experiences of the life insurance companies. One of the largest of the old line companies reports for the years 1906-07-08 an average of 13.22 per cent. of deaths from tuberculosis among its policy-holders, these, be it remembered, being selected lives insured only after a medical examination which eliminates as far as possible those who have a "family record" tainted by the tendency to tuberculosis.

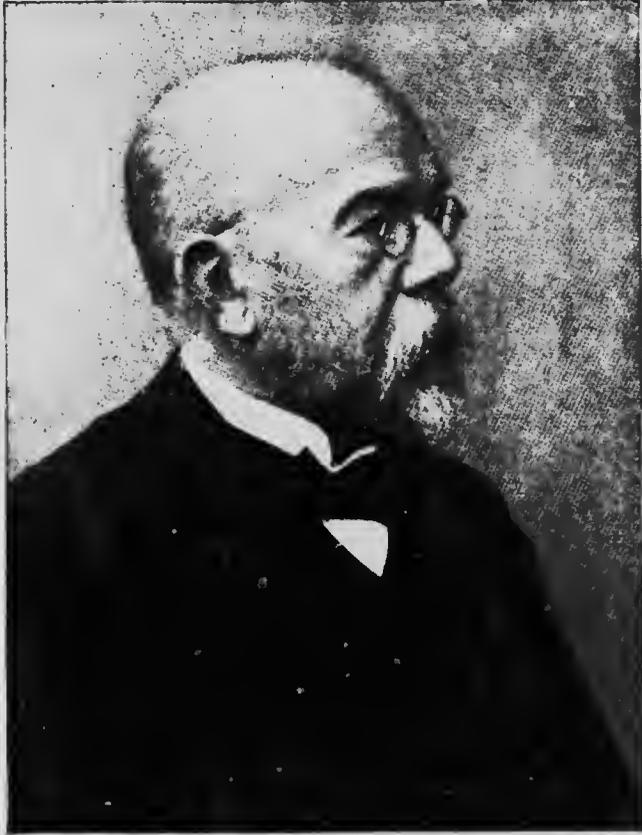
Another large company shows an average rate for twelve years of over 21 per cent., and estimates its annual losses through this one disease at \$800,000. A third company, doing a large industrial business, found during the year

1907 that 18.20 per cent. of deaths of males and 15.82 per cent. of deaths of females insured by it, were from tuberculosis.

It can easily be conceived from these statistics what an immense bearing this disease has upon so important an economic institution as life insurance, and to what an extent the cost to policy-holders is necessarily increased by the existence of consumption.

So much for the cold facts of the story, for the enormous addition to our death rate; for the argument to the individual pocket and the national and communal treasury. But aside from all this, how can we express in words or figures what may be called the purely sentimental side of the question? How can we measure the pain and bodily distress, the withered hopes and aborted effort, that fail to the lot of the unfortunate victim, or the mental anguish and grief and desolation of those who are left to mourn?





[By courtesy of Board of Health, Salem, Mass.]

DR. ROBERT KOCH OF GERMANY.

THE DISCOVERER OF THE MICROBE OF CONSUMPTION.

Born, 1843. Died, 1910.

"There are many, indeed, who doubt the possibility of successfully controlling this disease, which has existed for thousands of years, and has spread all over the world. This is by no means my opinion. This is a conflict into which we may enter with a surely founded prospect of success. . . . This is a visible and palpable enemy which we can pursue and annihilate, just as we can pursue and annihilate other parasitic enemies of mankind." *Koch.*

CHAPTER III.

Nature and Cause of Consumption.

THE nature of disease and its prevention or mitigation naturally attract the study of mankind. Disease, or the failure of our bodily functions, holds over us all its ever-menacing hand. Apart from the pain and suffering which it entails, it interferes with our powers as thinkers or as mechanical labourers; it brings want and poverty and premature death. We scarcely realize how much the welfare of our bodies shapes our earthly destinies. But the nature of many diseases is such as to have baffled our understanding, and to have of necessity been hidden from us until modern invention supplied the physician with means for their proper study. It is not to be wondered at that in ages past man lay down in dumb terror before a pestilence as if a demon were pursuing him; he knew not that the actual cause of the plague that devastated his home was of a material nature, though to the unaided eye unseen. The discoveries of scientists have reduced many of the former mysteries of disease to the level of plain physical facts, and among the many we may number the nature and cause of that greatest and most widely prevalent of all human diseases—tuberculosis.

The idea of this disease being infectious or communicable is no new one, although this important point was for ages allowed to lie in the background. Acute observers have at all times protested that consumption was dangerously contagious, and easily contracted by transmission. But little attention was on the whole paid to this theory even by medical men; logical proof was lacking. It was not until the discovery was made that minute living germs are the cause of many diseases, and one amongst these germs was identified as being the direct and sole cause of tuberculosis, that students of medicine found themselves standing on firm ground. Dr. Robert Koch in 1882, after a long and laborious investigation, succeeded in crowning the labours of his predecessors by demonstrating the fact that the active cause of all forms of tuberculosis is a minute living germ to which the name of the tubercle bacillus was given. This discovery ranks as one of the most beneficent and useful of all the deeds of man, and by giving us a definite knowledge of the cause of the disease has enabled us to take a sure foothold in the struggle to diminish, and finally prevent, the ravages of consumption. In all parts of the world scientific workers are labouring at the task of seeking a sure and specific cure, while public sentiment has been awakened to taking steps for combating the disease as a great social evil. In all civilized countries to-day health authorities are alive to the importance of the problem and to the great possibilities for success, and already a striking advance has been made.

Consumption is the name popularly given to tuberculosis of the lungs; in other words, it is a chronic disease caused by the presence

and activity in the tissues of the lungs of the germs of tuberculosis. These germs, the tubercle bacilli (the Latin word bacillus plural, bacilli- means a little rod) are very minute living bodies belonging to the vegetable world. Small though they are, they are as distinct in their nature and as well defined in their physical properties as the trees or the grasses that grow upon the surface of the earth. For purposes of comparison and ready realization of their nature, we may roughly compare them to the better known germs that constitute the moulds that rot our vegetables, that cause meats to putrify or turn our milk sour. If we examine under a high-power microscope a properly prepared specimen of the material coughed up (sputum) from the lungs of a person suffering from consumption we find it to be infested with great numbers of the little rod-shaped germs. They are extremely minute; 8,000 of them end on



[By courtesy of Board of Health, Salem, Mass.]

TUBERCLE BACILLI.
Microbes of Tuberculosis, magnified
1,000 times.

end may only measure an inch; but under the microscope they can be clearly seen and studied, and can be differentiated from other germs. Not only is this particular germ to be found in the affected parts in every case of tuberculosis, but it is not found in any other disease. It can be caused to grow outside the body, if given the proper food or soil, just as green mould can be grown on damp boots in the dark. Thus grown outside the body, or extracted from the sputum of consumptives and then introduced into the bodies of animals, such as rabbits or guinea-pigs, these germs will reproduce tuberculosis in them exactly similar to the disease of the person from whom the seed-germs were taken. Proofs have been multiplied by countless experiments, every manner of test has been employed, and the whole scientific world now accepts these facts as clearly proven.

Exactly in the same way as the bacilli attack the lungs, so also may other parts of the body afford lodgment to these dangerous parasites. As to what particular structure may become attacked, much depends upon the avenue through which they enter the body. The skin, though rarely, is sometimes infected, or sometimes the digestive tract. When the delicate membranes of the brain are involved, we meet with that terrible form known as tubercular meningitis, which carries off so many of our bright young people. "Scrofulous glands of the neck" is nearly always only another name for tuberculosis which has gained a foothold in these organs through diseased tonsils or adenoid growths. But next to consumption of the lungs, it must be accepted that the involvement of the bones and joints is fraught with the most lamentable results. The distorted body of the unfortunate hunch-back, the shortened limb of the victim of hip-joint disease, the bed-ridden sufferer from white swelling of the knee, these, too, are but part of the wretched work of the deadly tubercle bacillus.

CHAPTER IV.

How Tuberculosis is Contracted.

IN the first place, as surely as to grow a crop of wheat you must sow wheat, so must the tubercle bacilli become planted within the body to develop tuberculosis. There is no other way. It cannot arise within us in any mysterious manner; it does not spring up of its own accord, nor otherwise than from the entrance of these germs.

How then may they invade the human system? There are three chief ways:—

I. By being inhaled in the air we breathe.

II. By being swallowed.

III. By inoculation through the skin.

This third way is of comparative infrequency. Cases occur occasionally where, through handling tuberculous meats or from coming in contact with the sputum coughed up by consumptives, a cut finger, for example, may become infected. However, such cases are infrequent, and we need not dwell here at length upon this method of infection. The first is the most important by far. As we have already stated, if we examine the phlegm or matter coughed up by a consumptive, we find it swarming with the germs of tuberculosis. A very small quantity of this sputum may contain millions of these germs, so tiny are they; and yet each one of them is alive and able to reproduce its kind. We can easily see how, if the patient be careless in expectorating or coughing, and his sputum is deposited recklessly in all directions about him, so that it can dry and become pulverized, the air in his room will become laden with the death-dealing seeds of the pest. Anyone breathing the atmosphere of such a place is bound to inhale large numbers of the germs, and runs the risk of catching the disease.

So, too, in regard to the second avenue of entrance, namely, through the digestive tract. We can see how food prepared or handled by a careless or dirty consumptive, or in an atmosphere contaminated by him, can become the vehicle for transmitting the infective material. Carelessness in coughing, or spitting or sneezing may deposit particles of sputum upon the food, or the germs scattered about the room may fall upon it, or be carried there by that busy distributor of filth, the common house fly. Articles used at table by a consumptive or the common drinking cup of trains or schools or workshops may act as carriers.

Aside from such methods of indirect infection from a consumptive patient, there remains to be mentioned the possibility of acquiring the disease through the use of meats of tuberculous animals, or the milk of tuberculous cows. At this stage we are called upon to consider a further point which commonly suggests itself to the inquirer.

It may be asked why, since consumption is so prevalent and many consumptives so careless, and since therefore the germs must of necessity

be found in all directions about us, why is not the number of victims much greater? how, indeed, does anyone elude the disease? It must be true that everyone of us at some time in our lives, if not frequently, inhales into his lungs numbers of these germs. How, then, do we escape? Shortly, the answer is this, that it is necessary for the growth of the bacilli that one's system should afford a favourable soil. In the first place, germs, like all other living things, must find food suited to their support; they must find moisture and other suitable physical conditions before they can grow and multiply. Deprived of these, and exposed to conditions unfavourable to their growth, they perish. Tubercle bacilli, for example, when exposed to the action of sunlight and pure air, die much sooner than in damp and dark places, just as light and absence of moisture are hostile to the growth of green mould.

We know, moreover, that everybody possesses certain powers of resisting infectious disease. Certain processes are set up naturally within our bodies, which act at once to expel the offending matter, or to destroy its virulence. Some people are entirely proof against certain contagious diseases, whilst others are very susceptible to the slightest contagion. It is thus with respect to the bacilli of tuberculosis. But let even the strongest become enfeebled through any means and his susceptibility increases. Let any individual lower his powers of resistance, for instance, through improper methods of living, through drunkenness or excesses of any kind, or let his vitality be lowered by some other affection, and he straightway offers himself as a ready sacrifice to the deadly foe.

The further consideration of the chief causes which render the human body more receptive to tuberculosis, will be taken up at length in a later chapter; but meantime, let us divest our minds of one of the chief fallacies regarding consumption, namely, the belief that it is inherited. There are, it is true, a few cases on record of direct transmission of the bacilli from the mother, so that the child was born already infected, but such cases are exceedingly uncommon. The belief in the inheritance of consumption arose, perhaps, not unnaturally, from the frequent occurrence of several cases in the same family. Everybody can recall certain families of which member after member succumbed to tuberculosis, so that popularly it is said that consumption "runs" in such and such a family. All this is clear, now that we know the real nature of the disease; such persons do not inherit consumption itself; they must catch it; but they may inherit something which is of no slight moment, namely, what is called popularly a tendency to consumption, a predisposition to it, a greater likelihood to contract the disease when exposed, weak powers of resistance to the activity of the germs, a favourable soil for them to grow in. Aside from this, moreover, we must recognise another very different but very potent cause for the sadly frequent loss of one after another in some families. There can be no doubt that in many instances, the real reason for such occurrences is the fact that the home in which they live becomes infested with the germs that have been scattered about the house in the carelessly distributed sputum of the first victim in the family, so that the dead or dying infect those who are long ere to follow them. These latter thus are exposed doubly to the danger; they were endowed at birth with feeble powers of resistance against this especial disease, and the fatal poison is ready at hand in their own homes.

CHAPTER V.

Sum.nary.

LET us summarize briefly the important facts already set forth, and some of the lessons they suggest before we go on to illustrate some of them at greater length.

(1) All forms of tuberculosis, including consumption of the lungs (sometimes called phthisis) are caused solely by tiny living germs which as they grow and multiply tend to destroy the affected parts and to poison the whole system with their products.

(2) These germs enter the body chiefly through the air we breathe or the food we eat.

(3) The common source is the sputum coughed up by persons already suffering from the disease.

(4) This sputum, which swarms with bacilli, if not destroyed, dries up, becomes pulverized, and in the form of dust is inhaled or swallowed by others.

(5) Food contaminated by such dust or by the agency of house flies or in the form of meats or milk of tuberculous animals may introduce the germs into our systems.

(6) If all the sputum coughed up by patients with consumption be destroyed or disinfected, the consumptive ceases to be a menace to his neighbours.

(7) *Bear this in mind*: It is not dangerous to live or work with a person who has consumption if he is careful and cleanly, and destroys his sputum as it is coughed up. The breath of consumptives during ordinary respiration does not contain the bacilli.

(8) Consumption is not hereditary. In many cases children of tuberculous parents inherit a lessened resistance to the disease, as compared to children of healthy parents, but family predisposition is not as important a factor as direct infection.

(9) The lungs of healthy people can resist and destroy small numbers of bacilli, but if through any depressing cause their powers of resistance are lowered, the seeds of the disease take hold and flourish.

"The kaleidoscopic phenomena of this earth as we see them around us are the result of a continuous iteration of life and death. In this beautiful panorama death is as necessary as life. Something is always dying that something else may live. Inorganic matter continuously is being changed into organic matter and organic into inorganic. For changing organic matter into inorganic matter, God had created the interorganic world.

"A micro-organism which, perhaps, has slipped away from its natural place in organic nature, and in consequence has done much damage to man, is the tubercle bacillus."—*Flick*.



ADIRONDACK COTTAGE SANATORIUM, TRUDEAU, N.Y. THE ORIGINAL ONE-ROOM COTTAGE WHERE DR. EDWARD I. TRUDEAU BEGAN HIS EXPERIMENT WITH THE OPEN AIR TREATMENT OF TUBERCULOSIS.

"Then comes the startling question that pierces the breaking hearts of so many thousand afflicted relatives: 'Is there no remedy? Is there no palliation of the evil?' It is one of the greatest triumphs of scientific medicine to be able to reply, 'Yes, the evil may be palliated and is rapidly being lessened, and for many, at least, a remedy has been found.'"—*Ozier*.

CHAPTER VI.

Some Indirect Causes of Tuberculosis.

HAVING already discussed the question of inherited tendency to tuberculosis, let us devote a few words to the subject of acquired susceptibility. It is a well-known fact that men apparently sturdy and robust frequently fall victims to this disease. Let us take such a series of cases as occurs to the memory of any of our readers. One we will recall is that of a young farmer or fisherman who, as a result of exposure, catches a heavy cold, which clings to him for a time, when gradually after a few months a change is noticed in the nature of his cough, and it is seen that his general health is beginning to fail, and that he is probably consumptive. How did his case turn into one of consumption? The answer is that the weakened, inflamed surface of the lining membranes of his air passages afforded a ready foothold to the bacilli of tuberculosis, and the lessened energy of his whole system was unable to throw them off or overcome them.

Or, in like manner, we recall the little one who, after an attack of whooping cough or measles had passed away, failed to regain his former health, and in a little while developed the fatal consumption.

Or again, the mother of the quickly increasing family, worn out by the cares and duties of motherhood, exhausted by physical drain and household worry, loses at length her powers of recuperation, and she, too, falls a victim.

In all these cases we perceive the predisposing cause in something or other that lowers the vitality of the body, and prepares the soil for the bacteria to grow in; whether it be some intercurrent disease, or fatigue or nervous strain, dissipation, insufficient and improper food, or residence in ill-lighted and ill-ventilated rooms, the process is the same.

Consumption of the lungs is the most frequent form of tuberculosis; the lungs are the commonest lodging-point for the germs. Why this should be the fact is easily understood when we consider the method by which the disease is spread—namely, by the agency of infective dust floating about in the air, ready to be inhaled and take lodgment in the delicate membranes of the lungs. We can understand, too, how any cause whatever that tends specially to render the lungs less robust will tend indirectly to lead to consumption. Thus, for example, persons whose chests are ill-developed are proverbially prone to the disease. Any occupation or mode of life involving constrained breathing, a stooping posture at work or in school, tight-lacing in girls and women, the presence of growths obstructing the nose or throat—all these hinder the proper development and the nutrition of the lungs, as well as interfere with the general bodily health. Occupations in which much dust is inhaled, it can readily be seen, are likewise injurious in this regard. In short, it is one of the chief axioms of life, to the end that we may enjoy good health,

that free constant enjoyment of pure, fresh air is necessary to the well-being of the lungs, and of the body as a whole. It is true that farmers and fishermen and sailors, men whose work is done in the purest of air, often die of consumption. But other factors enter into their cases, which nullify to a large extent the advantages their occupation affords. For one thing, they are constantly being exposed to the risk of severe colds and



SECOND STORY SLEEPING PORCH SUPPORTED BY
4"X4" TIMBERS.

"Give him air, he'll straight be well." *Shakespeare.*

many hardships, and perhaps more particularly in another regard they are no better off than many men in other walks of life. The fore-castle of an ordinary vessel, where perhaps a dozen men breathe for hours the foul, contaminated atmosphere of a space hardly big enough to afford pure air for one or two, is certainly no less inimical to health than the much-abused sweat-shops of the cities. Then, too, in the case of the farmer, he may, and often does, spend his night-hours in a tiny chamber, generally the smallest in his house, and with the windows hermetically sealed, so that we need not wonder that in so many cases the inhabitants of the farm-house fare no better than the dwellers in the crowded town. Amongst this latter class, we need have no difficulty in discovering an

abundance of the elements of danger. It is true that in our community no such conditions of overcrowding exist as in the great cities. There this is an evil of awful proportions. In Paris, for example, three-fourths of all the families live in three rooms or less, and in Paris it has been found that the number of cases of tuberculosis increases as the number of rooms in a tenement decreases. But even in our beautiful little villages and towns similar conditions on a smaller scale may be found. How often, indeed, do we not find even in the dwellings of the well-to-do, the largest, brightest rooms of the house devoted to the so-called parlour and sitting-room, while two or three or even more children or adults are penned up for eight or nine hours of the night in a small den, little bigger than the bed.

Insufficient or improper food is a recognised predisposing cause of tuberculosis. Fortunately, in our beautiful land extreme poverty and its attendant starvation are not frequent. But there is no doubt that amongst our people, as elsewhere, there is much misunderstanding upon the question of foods. In order to nourish our bodies and enable us to work and be healthy, food must be of the proper kind, and in proper

proportions. Particularly in the diet of the young is error committed. Physicians are constantly being confronted with the picture of the pasty, blotched face, sore eyes and scrofulous glands of the child of three or four years, who, he finds, drinks the strong tea his father does, and can be satisfied with nothing but cake and candy. Improper eating and improper cooking probably produce as much disease and ill-health as any single cause. It is encouraging to see even the small beginning that has already been made in the teaching of domestic science, and there is little doubt but that if such teaching were compulsory and universal in our public schools, it would work wonders in the way of making our people healthier, happier, and more prosperous.

The abuse of alcohol must undoubtedly be reckoned one of the potent factors in predisposing to consumption. The evil effects of intemperance in strong drink in this regard are matters of every-day knowledge. Not alone does it work bodily injury upon the individual addicted to the vice, and render his disordered functions and enfeebled tissues less able to fight off infection; but in so many cases that we can all recall does it not account for those conditions of wretchedness and gloom that make the drunkard's home a breeding-ground for disease? Hard work and mental worry, insufficient food and unsanitary surroundings, the lack of comforts and all the other results of unhappy poverty, fall to the lot of the unfortunate wife and children. And as for the children, born and to be born, of the beastly and besotted alcoholic, how can they be expected to inherit a strong and vigorous constitution, or to escape the effects of the sins of their fathers?



THE MODEL OF A CHEAP SLEEPING-PORCH.

"Look not mournfully into the past. It comes not back. Wisely improve the present. It is thine." *Langfellow.*

CHAPTER VII.

Tuberculosis in other Organs than the Lungs.

IN regard to tuberculosis affecting other organs of the body than the lungs, the subject is one which cannot be profitably considered at length in this booklet, as the discovery and recognition of the disease is most often a matter of close medical investigation.

As regards, for example, tuberculosis of the membranes of the brain (tubercular meningitis) or general tuberculosis, where the germs are scattered all over the body, the early symptoms are difficult of popular description. The presence in children of enlarged glands in the neck is a sign that should lead to further examination; for although often due to other causes, such as decayed teeth, etc., they may also be an evidence of tubercular infection. When coupled with diseased tonsils or adenoids (soft growths which block the back end of the nostrils and cause mouth-breathing) enlarged glands often signify that tubercle bacilli which have been caught in these entangling obstructions, have entered the system, and have lodged in the glands which act as filters, and have begun to set up irritation there. Hence the necessity of having such growths attended to, not only to remove unhealthy traps, but to secure free breathing.

Tuberculosis, when it affects the joints and bones, leads eventually to softening and breaking down of the parts, just as it does elsewhere. If the seat of the disease is in the spinal column, the decay of one or more bones of the back may follow, and death or an deformity called hunch-back results. So, too, about the hip-joint or the knee or wrist, such destruction may take place as to lead to terrible lameness or even death. One of the early symptoms of tuberculosis of the joints or bones is lameness of the limb or a tendency on the part of the victim to avoid the use of that limb. The arm or leg becomes easily tired. The part affected may be tender on pressure. The watchful parent who perceives anything of this nature will seek immediate aid, for in the early stages of these troubles, treatment is of great avail.



A MODEL OF A WELL-PROTECTED SLEEPING PORCH.

"Pure air, pure water, and a pure soil." *Hippocrates*

CHAPTER VIII.

Correction of Predisposition to Tuberculosis.

IN view of the well-known facts that certain persons seem to inherit a special disposition to tuberculosis or to possess from birth a susceptibility to it, it behoves us to consider in what manner this tendency may be overcome. We recognize that some families furnish many victims to the disease. Consumption is said to "run" in some families. In other words, this merely means that children of some parents inherit a poor constitution with weak lungs and flat chests and little or no power to resist infection. Children of this type should be brought up with the utmost care, with the constant purpose in view of correcting as far possible the vicious tendency.

This is the period wherein the human being is acquiring and forming the body which is to serve him through life. As to whether he shall have a serviceable, robust frame to enable him to do his work with ease and happiness and freedom from pain, or whether he shall be at the mercy of a feeble constitution which hinders him in his efforts and brings him suffering or failure or poverty, how much depends on the care and education his body receives during these early days!

Delicate children are unfortunately apt to be mentally precocious, and development of their brains and nervous systems advances at the expense of the rest of their bodies. It is only right that the mental education of such children should be delayed and even partially sacrificed in order to secure the highest development of their bodily health. They should be kept from school longer than other children and should not be allowed to spend too many hours in study. They should be brought up as much as possible out of doors, and when indoors should have plenty of pure air and light.

Children of this class are also very apt to be poor eaters. Being delicate, they are often pampered, and through mistaken kindness are permitted to consult their own wishes as to what they shall eat, and are allowed too many sweets, and tea and coffee and indigestible dainties. All this should be corrected and the diet and digestive functions carefully watched, since food and its assimilation constitute the first factor in the process of nutrition. In this connection, do not forget the teeth of the child. Diseased teeth and gums mean insufficient chewing of food; the food is bolted in coarse masses, and digested with difficulty; besides they are the resting-place of many kinds of offensive and dangerous germs. The farmer or horse-owner knows well the effect of bad teeth upon his beast's health, and can appreciate its importance in the case of the human being.

We have already referred to mouth-breathing in children, due to the presence in the throat of enlarged tonsils or adenoids. If your child habitually breathes through the mouth, or snores, have the throat examined.

The nose is the only proper entrance for the breath; its chief function is to warm and moisten the air before it reaches the lungs. Breathing in the raw cold air through the mouth injures the membranes of the lungs and bronchial tubes. The early removal of such growths is therefore earnestly recommended.

Exercises for the development of the lungs should be begun as early as the child's intelligence will permit. Deep breathing should be encouraged and simple exercises should be taught with a view to the proper use of the chest. The system of physical exercises and drill now in process of introduction in the public schools will without a doubt prove of great benefit in improving the health of pupils and is deserving of the warmest encouragement. The generous assistance given to the promotion of this scheme by Canada's great-hearted and public-spirited High Commissioner, Lord Strathcona and Mount Royal, calls forth the highest commendation of all who are interested in the welfare of the Canadian people. His gift of five hundred thousand dollars, the income from which is to be devoted yearly to the purposes referred to, manifests the importance attached to physical education by so practical and thoughtful a philanthropist as his Lordship.

It must be reiterated that fresh air and sunlight are essential needs of the body, and particularly to the young. A common fallacy still persisting is that night air is dangerous, and many people insist on excluding it from their sleeping-rooms as if it were poison. We spend one-third of our lives in sleep, allowing our bodies to make up for the wear and tear of our daily labours. It is very important, then, that during this period the body should have as large a supply as possible of pure air. The bedrooms of the children should be kept thoroughly ventilated night and day. Carpets and heavy curtains harbor all manner of dirt, including disease germs, and should be excluded.

It is needless to dwell on the injurious effects of tobacco upon the young and growing boy. Everybody recognizes the evil, the boys themselves as well as their elders. In towns where the athletic spirit is strong, this itself is proving an effective promoter of abstinence, for the boys realize that tobacco is hostile to good condition and "fitness." Late hours and all sports inducing over-fatigue or over-excitement are, needless to say, unsuited to the weakling. The use of the bath is an especially important agency in invigorating the constitution. Through it one of the most important organs of the body, the skin, is kept in healthy activity, and the blood circulation of the whole body is assisted. The frequent use of the cool bath is one of the best preventives against catching cold. It is admitted that some constitutions require that the use of cold-bathing must be carried out judiciously, and that too rigorous application of the hardening process may be injurious to the weak child. In cases where common-sense shows this to be the case the use of the sponge-bath or douche with free use of the towel afterwards should be frequently resorted to.

The choice of a life-occupation for the youth who has a weak constitution is a matter for thought. In general terms, it is the wisest plan for such a one to give up the idea of adopting a profession or trade that is going to keep him confined to a dusty workshop, the bad atmosphere and sedentary life of an office, or that will prevent him from enjoying fresh air and out-door exercise.

No wise parents will allow their children to associate directly with others who are suffering from consumption, and they should be kept from visiting the homes of consumptives, excepting, of course, where careful attention is paid to the "rules for the consumptive." The health and habits of nurse-girls or others to whose care children are committed should be investigated. Kissing children on the mouth should not be allowed to strangers, and children should be taught to avoid allowing acquaintances to kiss them except on the cheek.

The question of schoolroom hygiene will be referred to in another chapter under the heading "Suggestions to School Authorities," and the attention of parents is requested to the matters there considered.

The duty owed to their offspring by tuberculous parents or by parents in whose families consumption is frequent, is great and pressing. It is their duty to see that every means in their power is employed to overcome the tendency in their children; to give them every chance to obtain a full share of the greatest of all earthly blessings, health; to try to place them on an even footing physically with other members of the human race. The results of their endeavours will tell not only upon their children, but upon their children's children, and all future members of society.

And let not those who are members of families in which consumption has occurred feel that their own chances of avoiding the disease are jeopardized by this fact. The invasion of tuberculosis is in many cases so accidental, so dependent on peculiar circumstances in the life of particular individuals, as to have no meaning whatever in regard to hereditary tendency in their instances. Remember that direct inheritance of tuberculosis is practically non-existent; that every victim must "catch" it by infection; that most often the occurrence of numerous cases in one family is simply due to an infected house; that when this source of danger is eliminated, persons with a tubercular family history may, by obeying the laws of health, become less likely to contract the disease than those who, having strong constitutions, abuse them by folly and excess. As an eminent medical authority puts it:—

"Probably there are few families in which the consumptive tendency is so strong that it could not be kept in abeyance by hygienic precautions if they were thoroughly and vigorously carried out; and, on the other hand, there are very few families, if any, in which the disease may not show itself in such members of it as systematically neglect their health, or are exposed year after year to unfavourable conditions."—*Principles and Practice of Medicine.* By Fagge and Pye-Smith.

"If the school building were a model of ventilation, lighting, and sanitation, it would not only conserve the health of the school children, but also serve as an object lesson for hygienic instruction. In the same way cooking and domestic science classes could be made to serve the double purpose of providing a hygienic noon meal and training the school children, especially the older girls, in the principles and practice of this vitally important subject. Our schools are suffering from the conventional idea that education comes from books. Education is preparation for life, and should make use of every efficient method and element, manual training, athletics, observational nature study, laboratory experiments, and object lessons of all sorts, as well as book instruction"—*Irving Fisher's Report.*

CHAPTER IX.

The Early Symptoms of Consumption.

IT is of the utmost importance both for the patient and those about him that the disease should be recognized as early as possible. In the first place, if there be any suspicion or doubt, consult a physician. Do not put it off a day; better take needless precaution than suffer through regrettable delay. The earlier the stage at which the disease is seen, the greater the hope of curing it. Hence the great importance of having an early examination whenever symptoms exist that may possibly pertain to tuberculosis. Here are some of the early symptoms, any of which should lead you to consult your physician:—

1. Continued cough; a cough or cold lasting three or four weeks
2. Loss of weight or strength or usual colour.
3. Feverishness or flushing in the afternoon.
4. Loss of appetite.
5. Bleeding from the lungs.

None of these symptoms necessarily mean that you have consumption. Not all of them need to be present to signify that you are affected; but particularly if you have a persistent cough and loss of weight with weakness on exertion, your condition should be carefully looked into.

Among other symptoms that may sooner or later become prominent are night sweats, spitting of blood, loss of voice and pain in the chest. It would be out of place here to go into a description of the signs by which the physician is able to detect the nature of your case. By sounding your lungs and listening to the breathing in all their parts, by the use of the thermometer and many other methods he is able to decide on the presence or absence of tuberculosis.

The modern microscope and its accessories afford especial assistance. The presence of the tubercle bacilli in the sputum, or material coughed up from the lungs, enables him to reach a sure conclusion. These bacilli may not be found in the sputum in the very earliest stages of the disease, but even then other means of diagnosis make it possible to recognize the presence of the enemy and thus more easily to forestall its ravages. The point upon which we wish to insist here is the great importance of attending *at once* to any ailments of the nature here described. If the trouble is found not to be tubercular so much the better; if the verdict be otherwise, the chances for cure are increased many fold by reason of the disease being recognized in the incipient stage. Thinking people are understanding more and more the wisdom of seeking relief for the smaller ailments of the body, realising that many of the severest chronic diseases arise insidiously from apparently trivial beginnings. In fact, if people consulted their physicians oftener in health they would oftener continue healthy. Prevention is better than cure—and much cheaper.

CHAPTER X.

Precautions required of Consumptives.

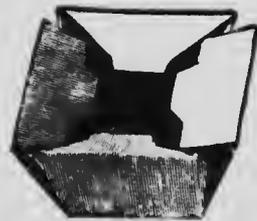
THE facts being conceded that consumption is an infectious disease, and that the chief source of infection lies in the bacilli scattered about by those who already suffer from it, it is clear in the first place that by closely guarding against all means by which such dissemination takes place, the first and most important step towards eradicating the disease will be accomplished. If the production of the seed and the sowing of it be made to cease, then must the crop of new cases cease to come forth. If no more tubercle bacilli were produced from this moment, and all existing germs were allowed to die out, then, of course, there would be no more tuberculosis. These propositions are clear to all.

We shall deal first with the means by which we may prevent the sowing of the seed. We have pointed out that the bacilli are found in enormous numbers in the sputum of consumptives, especially in the more advanced stages. Let this sputum become dried, powdered into dust and scattered through the air, and it may be inhaled and start tuberculosis in others. Here then lies "the fount and origin of the evil;" and here must precautionary measures begin. The consumptive who spits carelessly is doing his worst to infect those about him, and the house and rooms he occupies become veritable danger spots. He even injures his own chances, for he may have healthy parts of his own lungs or his other organs infected by breathing in the dried bacilli he himself coughed up. So, too, on the contrary, where proper precautions are taken, there is no danger from consumptives. In hospitals and sanatoria, where these are rigidly insisted on, even with large numbers of consumptives about, the attendants remain healthy. How strong, then, is the duty of the consumptive to use the utmost care at all times not to act as a sower of infection. He should realize that everything he spits up is dangerous to himself and to others, and that it should be watchfully collected and destroyed.

He should never spit about a room or the house or public buildings or



FRAM SEABURY AND
JOHNSON SPIELING, CTD.



FOLDED CARDBOARD TO BE
BURNED AFTER USE.

PRECAUTIONS REQUIRED OF CONSUMPTIVES.

conveyances, or on the sidewalk, nor into any place where he cannot destroy the germs he coughs up. If accidentally this sputum should fall upon the floor or any object about the house, it should be immediately wiped up and the spot washed with some strong antiseptic. Whenever possible,



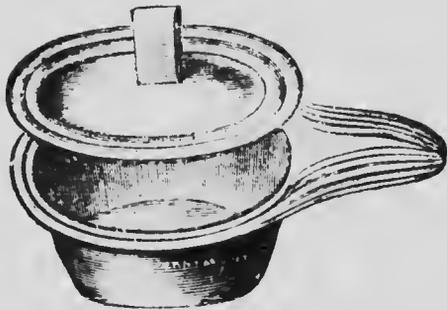
Spitting cup.

the matter should be received in a cup kept for the purpose, which should contain some water so that the sputum cannot become dry, or better, a 5 per cent. solution of carbolic acid (1 part of acid in 20 of water). He should see that *everything* coughed up goes into this. The cup should be emptied into the water-closet several times a day, and cleansed with boiling water. Cups specially made for the purpose can be obtained, including paper ones, which can be burned, and which are, perhaps, preferable, and also pocket spitting flasks, which should be carried when going about. In the place of spitting cups, rags or folded papers which can be burned may be used at home, but always with care to see that they are kept from infecting other articles. They should not be put into the pocket unless wrapped in waterproof material, or a thick paper covering. These should never be allowed to dry, but should be burned at the first opportunity.

The patient should never swallow his expectoration; this is important in order to avoid infecting other organs of his body.

When coughing or sneezing, a cloth should be held before the mouth and nose in order to catch flying particles of sputum. But handkerchiefs or rags used for this purpose or for wiping the mouth should be either burned, or boiled half an hour. Paper napkins are useful for this reason, and it is a good idea when going about to carry a strong paper bag in the pocket in which the rag or napkins when used may be placed, the bag and its contents being afterwards burned together. Male patients with a beard or moustache should shave or crop it closely, as these form a ready receptacle for germs.

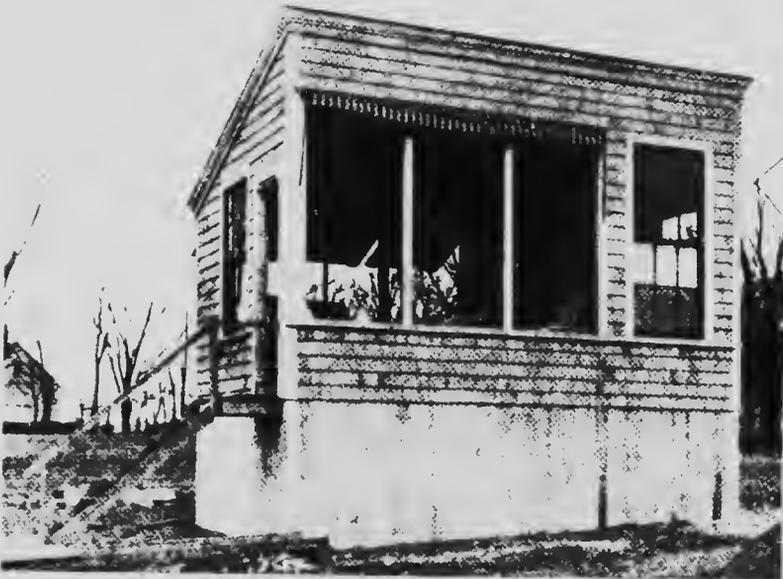
Frequently during the day the hands and face should be washed, especially before eating or drinking. Eating utensils used by the consumptive should be thoroughly cleansed afterwards; in fact,



Small cooking pot.

he should have separate table articles, kept for his own use, and these should be washed separately. It should be unnecessary to state that kissing should be avoided by the consumptive, and that consumptive mothers should on no account nurse their infants. The latter practice, of course, entails both danger to the child and a heavy tax on the mother's strength.

To sum up, let the consumptive patient bear continually in mind that by careful attention to a few simple rules he ceases to be a danger to those about him, his family and friends, and the public at large. The secretions from his lungs are the dangerous element, and where this secretion is destroyed as fast as produced, the consumptive is no longer a menace and a danger.



By Direction of Dr. T. S. Casperson.

MILFORD SALEM, MASS., COLLEGE FOR ONE PATIENT. ESTIMATED COST, \$2,000.

The MILFORD COLLEGE is 14 by 18 feet, supported by four corner posts, boarded and covered with shingles. The north end is a "quarter" 10 by 12 feet, with the rise to the front. The cottage is divided by a partition into a bedroom 12 by 12 feet, open on all sides, and a dressing room 6 by 12 feet, with two wash basins, heated by a stove, and a bed with a chamber, washstand, running water, toilet, and wardrobe. The rest of the walls of the building face the north end and are clad by wooden slates. The entrance is on the street level, and there is no plastering, and the floor is laid double, the upper layer of narrow, hard pine. The building complete cost about \$200. *From "Some Plans and Suggestions for Housing Consumptives."*

"If thou, well observe

The tale of not too much, by ramping, laugh
In what thou eat'st and drink'st, see'ing from thy
Due nourishment, not glutinous delight,
Till many years over thy head come,
So may'st thou live, till, like ripe fruit, thou fall'st
Into thy mother's lap, or be with ease
Gathered, not harshly plucked, to death's ripe season."

CHAPTER XI.

Micmac Summary.

OPOSGONINEMGEOEI.

(O)POSGONINEMGEOEI gisna nógmegeoei gisna tleereti notjemoin-geoei me atji pigoelgig ee tlelagoitij mimatjoing pgetes-no-geog-agig ag omamagig mo ngotei piloei oisges-agenigtog; eli tepetog tepiang gisi nigami psógateungesa.

Oetjag ógo net oisges-agen gesi aptjetij tjetitjoing ogpenigtog teli oetjitasitij maoi pigoelgig losgoatigenigtog tan notjemoit teoi losgoatga.

Nige tog teli oposgoninet tan pa sig tami allosgoatamitj giotógoio, losgoatigen gisi gispateg pisgoatóg oisges-agen ogtininoag tami telgig gamlanotemititjia.

Aomitasit oepsgoninet oig eli oetjoiag metoi tjetitjoingel, golaman mimaoimigig nsanogonigtog pisoltitij oitjei oisges-agen o'om-senemotineon.

Sgato oepsgoninet menagatj gagi gsegatóg tan tesig teoi losgoatg nógemegeoeigtog ma natalalagol oenel, ag mógoetj nesotenemeg ma atjenenog otógpeltineon.

Losgoatamitj tóg lamig-ómg sopintjijigtog, tógo tesig na ointijj gagi gsegatotj, gisna molsceigtog tan elja no-goatoteoi; ag gseg nógóe gisna olosgoatamitj, angótj mógoetj onislanon masgtagtog gisna otap-sungitog gisna tami sega.

Tjel alasitj, lóg angotj mo olosgoatamin epnetog aogtigtog, maoi mimatjomeógoomigtog gisna gasigtog, meloitj nscpietj aptjetit losgoatigenig, tanel gisi pgoateloatal mpisonógoomigtog, gisna molscei eotj tan montitijgtog oigatigenei masgoatóg ag elniag gagi no-goatóg.

Tjipetog teli pgitji nógemea gisna tgei matnesg piannio sist agentioimig, gisna pótjti alosm, gisna eli oapestagasin, gisna eli menaganam, gisna epostamien gisi minolagoeg, gisna malteo olosgoatigen, mo gpele nitgogoalao malpaleoi mangenio, nattamtjel menagatj gtagamolin; mo gpaótemo tjel neogtogoag, golaman notjemoingoei ma nepólog; pigoelgig teli nsóltitij. Mo gpegitjetemo pisoi mpisnel gegino goatasigel agnotemagani oigatigenigtog, ogtj mitatagon oisges-agen, mo gtetli gsepato gsoli acim, aoma li pipanin gmalpaleoitem tan gisgog teli melgi npitemeg op'osgoninemgeoei ag gsegio tleien tan telgimsa. Li goilotemo apógonenatimgeoei tan engasao pótjti neiasig oisges-agen, lóg pa gisi litasitesg genseina.

It is the province of the Legislature to provide the salary of the court, even if it interferes with the freedom of a learned society. *H. 46*

CHAPTER XII.

Comhairlean do Luchd na Caitheimh.

THU a chaitheimh a mairbhail tuilleadh sluaigh ann an Albainn Uir na tinnas san bith eile; gèibeadh faodar, gu uidhe mhoir, a cumail air falbh. Tha i air a leobharachadh le gearrainn gorms bheaga, bheotha a tha 'fas anns an tgeannan agus a tha n'inn fothuinn ann an aircamh mhoir anns na snuigadain a tha air an tilgeadh a suas le casdaich an duine air a bheil i. Nuair tha fear na caitheimh, gu mì-chumalach, a tilgeadh snuigadean mu'n cuairt da tha iad a tiorrachadh a suas agus tha na gearrainn air an tarraing a stagh le amail feadhainn eile, a tha mar seo a glacadh an tinnis. Nuair a tha snuigadean fir na caitheimh air an tilgeadh an siob's an seo air feadh an tugh bith an tugh air a lionadh leis na gearrainn, agus mar sin bith feadhainn eile 'san tugh ann an cumail a bhli air an bualadh leis a chaitheimh.

Ma chuireas fear na caitheimh as do gach nì a tha e a casdaich a suas cha bhli e na aobhar cumail san bith do dh' fheadhainn eile, agus faodaidh cumail a bhli aig sluaigh ris ann an tearr-ateachd. Bu choir dha, nuair a bhios e aig an tugh a snuigadean a chur ann mach ann an cupa agus cur as do gach nì a bhios anns a chupa. Ma chuireas e na snuigadean ann an breidean, feumaidh e na breidean a losgadh san teine. Feumaidh e an aire a thabhairt nach leig e le bonn de'n t-sile, neo na snuigadean a tha e casdaich a suas, tuiteam air an urlar, air an aircis, neo air 'adach. Cha choir dha snuigaid a thilgeadh air trobh staid, air urlar car-baid-larainn, neo ann an tugh. 'San bi sluaigh a cruinnichadh. Giulaicadh e leis na pheacaid cupa-snuigadean, nì a gheibh e ri cheumach ann an bith-dhrogaichean, airneo giulaicadh e leis poca pàipeir a bhios deas gu bhli air a losgadh.

Ma tha casd ort, neo enatan a tha mar sin na's fard ann tri seachdainean, ma tha thu a fas aotrom ann leoil, a fas ban san aghaidh, a fàireachdunn do neit a falbh, neo a fàireachdunn fàbhasach an deigh mbeadhion latha nach gu dad a dh'fhaicim do lighiche agus faigh e gu do staid a rannachadh. Na cuir daid air bith sa chuis. Cha tinnas a chaitheimh o'm fann an duine air a bheil i bas fhaotuinn. Thatar a leigheas mo ann de dhaoine anns an do thoisich i. Na cuir eubsa san bith anns na eangadhean-leighis a gheibh thu air an cliathachadh gu h'ad anns na pàipeirean-naidheachd. Faigh do lighiche fann gu doigh leighis an latha 'n d'ingh a m'innachadh diuit, agus ban gu cumalach gach seoladh a bheir e s'achad. Ma theid thu g'a ionnsaigh trath, faodadh dochas math a bhli agad gu'm bi thu air do leigheas.



By courtesy of Dr. G. D. Porter.

THE QUEEN ALEXANDRA SANATORIUM, TORONTO, ONT.

Treatment of moderately advanced cases. Capacity 100. Run by Dr. S. G. and Mrs. G. G. Porter.



By courtesy of Dr. G. D. Porter.

THE CLUB PAVILION FOR TUBERCULOUS CHILDREN, TORONTO, ONT.

Capacity 250. Nurses supervised by Dr. Homer Clay, an organization of graduate nurses.

The main aim of this pavilion is not to cure patients during their period of residence, but to teach them what they can do for themselves in their after life. The pavilion is used as hospital, then as schools (1920-1921, 1922-1923, 1924-1925, 1926-1927).

CHAPTER XIII.

La Consomption.

LA consommation tue plus de personnes dans la Nouvelle-Écosse qu'aucune autre maladie, et cependant elle peut jusqu'à un certain point être prévenue.

Cette maladie est causée par de très petits germes vivants qui se multiplient dans les poumons, et sont trouvés en grands nombres dans les crachats, ou flegmes renvoyés par le consumptif.

Quand le consumptif crache cela négligemment autour de lui ce flegme sèche et communique la maladie à ceux qui le respirent.

La maison dans laquelle demeure le consumptif négligent, devient infestée de ces germes, et les autres membres de la famille sont exposés à devenir victimes de la consommation.

Si le consumptif détruit prudemment toute la matière rejetée quand il tousse il n'est pas dangereux à la société, et peut être fréquenté en sûreté.

Chez lui, le consumptif doit cracher dans une tasse et en détruire le contenu, ou bien dans un linge qu'il doit ensuite brûler, et il doit voir que, lorsqu'il crache ou tousse, aucune goutte ne tombe ni sur le plancher, sur ses habits, ou sur les meubles.

Il ne doit jamais cracher sur les trottoirs, sur le plancher des chars ou d'un édifice public, mais doit porter sur lui un crachon de poche qu'il peut se procurer dans une pharmacie, ou bien se servir d'un linge porté dans un sac de papier qui doit ensuite être brûlé.

Si vous avez une toux ou un rhume qui dure plus de trois semaines, ou bien si vous perdez de l'embonpoint, ou si vous devenez pâle, ou si vous sentez diminuer vos forces, ou si vous êtes févreux dans l'après-midi, ou encore si vous crachez du sang, allez immédiatement voir votre médecin et faites vous examiner. Ne tardez pas d'un jour. La consommation n'est pas absolument fatale. Dans bien des cas on peut réchapper. Ne perdez pas de temps ni d'argent en remèdes patentés, annoncés sur les journaux comme antidote à la consommation, mais demandez à votre médecin de vous expliquer les méthodes modernes de traiter la consommation et suivez ses avis à la lettre.

Allez le consulter dès les premiers symptômes de la maladie et vous aurez grande chance de recouvrer la santé.

La consommation n'est pas héréditaire. Dans bien des cas, les enfants de parents tuberculeux héritent d'une tendance plus prononcée à la maladie, si on les compare à ceux de parents sains; mais la prédisposition de famille n'est pas un agent aussi important que la contagion directe.

CHAPTER XIV.

La Tuberculosis Polmonare.

LA tubercolosi polmonare è una malattia dei polmoni, che è presa da altre persone, che ne sono malate e non è semplicemente causata dai raffreddori, quantunque un raffreddore possa favorire lo sviluppo della malattia.

Lo sputo emesso dai tisici per mezzo della tosse o dello starnuto, è pieno di germi viventi o bacilli della tubercolosi, troppo piccoli per essere visibili. Questi germi sono la causa della tubercolosi polmonare, e quando sono ispirati nei polmoni, producono la malattia.

Mantenetevi sani il più che sia possibile, poichè quanto più forti voi siete, tanto più difficile sarà per i germi della tubercolosi di guadagnar terreno su di voi. Ogni persona dovrebbe osservare le seguenti norme:

Cercate di non vivere, studiare o dormire in camere dove non vi sia aria fresca. L'aria fresca e la luce del sole uccidono i germi della tubercolosi, ed altri germi causanti altre malattie, perciò abbiate il più che sia possibile di aria e di luce nelle vostre stanze.

Non vivete in ambienti polverosi, mantenete le stanze pulite, liberatevi della polvere o l'usare panni o stracci umidi.

Non spazzate con scope asciutte.

Mantenete una finestra nella vostra stanza da letto in parte aperta la notte, e date inoltre aria alla stanza due o tre volte al giorno.

Non mangiate con mani sporche. Lavatele prima.

Non mettete in bocca le mani, le matite o qualsiasi candy o chewing gum usati da altre persone.

Non conservate fazzoletti sporchi nelle vostre tasche.

Prendete un bagno caldo con sapone almeno una volta la settimana.

Non trascurate un raffreddore o una tosse, ma andate a trovare un dottore o recatevi a un dispensario.

Se voi o qualsiasi altra persona della vostra famiglia soffre di con-
sunzione, dovete obbedire alle seguenti regole per star bene:

Non consumate danaro in medicine patentate o specifici per la tubercolosi, ma andate a trovare un dottore, o recatevi a un dispensario. Se voi andate in tempo, voi potete essere curati; se voi aspettate, può essere troppo tardi. Non bevete whiskey o altri liquori.

Non dormite nello stesso letto con qualsiasi altra persona e se è possibile, non dormite nella stessa stanza.

Buon nutrimento, aria fresca e riposo sono le migliori cure; state fuori all'aria fresca e alla luce del sole il più che sia possibile.

Tenetle le vostre finestre aperte inverno e estate, giorno e notte. Se siete ben coperti non prenderete raffreddori.

Andate in un sanatorio per curarvi, quando la malattia è solo al suo principio, prima che sia troppo tardi.

L'ammalato di tubercolosi che abbia cura di sé e sia pulito, non è pericoloso per quelli coi quali egli vive e lavora.

CHAPTER XV.

Curability and Treatment of Consumption.

CONSUMPTION is no longer regarded as incurable. No longer is it necessary for those afflicted to feel that they have but to bow to the inevitable, that it is vain to struggle for health and life.

There has never been a time when it was not recognized that men have had consumption, and yet have recovered from it, although our ignorance of the true nature and cause of the disease prevented the adoption of rational treatment.

We know that tuberculosis of bones and joints and glands is often, nay, in the great majority of cases, cured and stays cured. Why not, then, tuberculosis of the lungs?

Furthermore, we know that every one of us, at some time or another, in fact often and often, must inhale the bacilli of consumption, which are so scattered in every direction about the community by the countless careless or ignorant victims of the disease; and yet we do not all die of consumption.

Still further, we know for a fact that a large proportion of us have given more than a temporary lodging to the germs; they have thrived, and still we have conquered them. We have had consumption and nature's methods have cured us. This is not conjecture, but is founded on absolute facts. Inspection of large numbers of dead bodies of men dying of other diseases, carried on without selection, by various competent experts in various cities, has shown that the unmistakable marks of healed tuberculosis are to be found in a very large proportion of all bodies examined.

Finally, the results of modern methods of treatment, as carried out in sanatoria, where statistics are carefully kept, prove conclusively the possibility of cure. Institutions where patients, in all stages of the disease, are received, are able to report that one patient in every four leaves cured, and 40 or 50 per cent. much improved, many of them once more able to work.

In those sanatoria where only cases in the early stages are treated the results are even more encouraging, and serve to illustrate one of the most important points in the handling of the disease, namely, that the earlier the disease is treated the better the result. Institutions of this type are able in some cases to effect a cure of at least 70 to 75 per cent. of those admitted.

In short, consumption, if detected and treated rationally in the early stages, is not hopeless, but may in many cases be cured. The earlier the better; the more advanced, the less hopeful.

No drugs known to science will in themselves cure consumption; physicians do not rely on drug treatment to cure. Quack remedies and

cur, but prejudice and ignorance prevailed against him and he was compelled to abandon his plans. In 1855 Dr. Henry McCormack of Belfast, in his essay on "Consumption as Engendered by Breathed Air," declared that it was exposure to indoor and not to outdoor air which we are to dread. Sir B. W. Richardson, writing in 1857, said that: "In a cosy room the consumptive is bound never to live, nor in any room indeed for any length of time. So long as he is able to be out of doors, he is in his best and safest home." The old plan of taking long sea voyages saved many a life although the advantages of the pure fresh sea air were to a great degree off-set by the confined quarters and poor diet. It was in Germany that it received its chief impetus. Over fifty years ago Brehmer established at Goerbersdorf the first sanatorium conducted on modern principles, the forerunner of the vast number now in existence in almost every part of the world.

To Dr. E. L. Trudeau, himself a consumptive, who found in pure fresh air relief from his disease, belongs the honour of being the chief pioneer and apostle of the sanatorium treatment in America. In 1884 he founded the Adirondack Cottage Sanatorium at Saranac Lake, now so widely famous as a centre for the cure and study of tuberculosis.

Finally the experience of medical men brought them to the conclusion that the plan of treatment which has best stood the test of time and has yielded the best results is the fresh-air cure, and to this plan to-day we must look for the greatest possible measure of success. While we must admit that it is not a sure and certain cure, and that even when carried out under the best conditions it often fails, yet it is by common consent the most hopeful course to adopt, and as such we must recommend it to the afflicted, trusting that some day in the early future the patient researches of the devoted investigators now engaged in the quest may give us a specific remedy which shall be as the waters of life and as a healing rod to the vast number of unfortunate victims.

The proper place for the carrying out of the modern treatment is of course the sanatorium. In many homes unfortunately it is impossible to secure that attention to details which counts for so much. In many, indeed, even the most essential elements are lacking. In cases occurring among the poor or helpless or homeless, it is often useless to give advice as to proper food or clothing, cleanliness or care when there is no money for food or clothing, no means or appliances at hand for nursing or cleanliness or disinfection. For such cases there is no place but the sanatorium. For all there is no place so good, but for many cases treatment must be carried out at home; if for no other reason, because all the sanatoria now in existence cannot house a tithe of the tuberculous. The consideration of such institutions, the necessity for them and their uses, will be the subject of a later chapter. Here for many reasons it is advisable that we should give some advice as to home treatment. As we have said, the vast majority of consumptives must as yet be treated at home, in the first place for the lack of sanatorium accommodation in general and of cheap or free accommodation in particular. For with a proportion of our people the payment of even a moderate weekly charge at an institution is out of the question, especially when the victim is the bread-winner. Let it be repeated that the treatment of consumption can best be carried out in a proper institution where the patient has constant supervision and care at

the hands of trained assistants. Moreover, the advice given in regard to home treatment in the following pages is only meant as a general guide for patients, for it can be readily understood that it would be impossible in such a work as this to give a complete treatise on the treatment of the disease, even if such could be carried out by the patient himself. Cases vary greatly, special symptoms predominate in some cases, others in others; so that hard and fast rules cannot be laid down to govern every patient. General principles are here set forth, as accepted at the present day, with such details as may seem to be useful to the ordinary patient. The aid of a physician is of the greatest importance. Consult your doctor and follow his advice, consult him about all details of food, drink, exercise, employment, clothing and general hygiene. Report all new symptoms to him, or any changes in your condition whatever. Take no alcoholics nor drugs except under his prescription. Be assured that the conscientious physician is interested in your welfare, ready to act as your counsellor in any regard, and that the day has never come when lack of money will prevent you from securing the aid of the medical profession.

A few words are in place here regarding change of climate. A thorough discussion of this question would fill a large volume. Often, however, the question does not come up, for the patient's financial condition may forbid, or his physical state may be such as to render departure from home inadvisable. It is usually a mistake to send away, particularly to a distant place, a patient in a very advanced stage of the disease. When the case is hopeless more comfort can be secured at home than elsewhere. Patients with a high temperature will do well to be treated at home until the active manifestations subside. Where change of climate is within the means of the sick the choice of the spot should depend on the nature of the patient's condition and constitution. To quote from a well-known Canadian authority, Dr. Geo. D. Porter, "In choosing a climate we must consider our patient as well as his disease, his temperament as well as his temperature, his purse as well as his pulse; ascertain whether he has means of support and also whether he intends to remain away permanently or purposes to return."

Here the advice of the medical attendant must be sought and the question decided on the facts. The sanatorium, we repeat, is the best place for the ordinary case. If he decides to go to a distant scene, let it be somewhere where he can be assured of care and suitable accommodation. Let him remember that after all the climate is only secondary, the great thing is to lead the right life, and follow the rules laid down. It is better to stay at home and follow home treatment than to go among strangers and lack the ordinary comforts.

The authority quoted above closes a recent paper with the following words: "A man with wealth may buy his way; a man with health may earn it, but the man without either who will have to be dependent upon the attentions and goodwill of strangers would do well not to travel too far; and from my observations of a large number of health-resorts on both continents I am convinced of the truth of the old adage that for the sick man, the man who needs the care of friends and a physician -- 'East, west, home 's best.'"

It is of the utmost importance that the mind of the patient should be at ease and that he should strive to avoid worry. Let him devote himself

entirely to the one purpose, namely, to getting well, and let him be confident that he is going to get well. Let him realize that the cure will be slow in any case, that he may have relapses, but patience and determination will work wonders.

The principal element of the cure is "fresh air." Briefly, this means that all hours of the day and night, sleeping and waking, it should be the



"It is hardly possible to estimate the value of fresh air and sunshine."—*Dr. Kidd.*

effort of the consumptive to breathe nothing but the pure air of out-of-doors. If it be possible, the patient should leave the town for the country, or at least forsake a dusty part of the town for a cleaner part. Let him avoid low-lying damp places of abode, and seek a home where he can have sunshine and free air all about him. Summer and winter he should spend as much time as possible out-of-doors, eight or ten hours at the least. He should make his indoors as much like out-of-doors as possible.

The room of the consumptive, which should be his alone, should be chosen so as to be on the sunny side of the house; it should be large and bright, and heated by a fireplace, if possible, as this is a great aid to ventilation. Carpets and heavy curtains,

and dirt-collecting stuffed furniture should be removed. Roller shades and removable washable rugs can be left. Let him remember at all times, whether in his own room or elsewhere, the rules about disposing of his spittle. Even then his bed-clothes should be frequently washed, and at intervals the whole room and its contents gone over with some antiseptic solution or disinfected with formaldehyde gas. Do not dust or sweep the room "dry"; go over it with a damp cloth.



Be Careful of Food at Health, Salem, Mass.

WINDOW TREATMENT.

The windows should be open night and day, except when he is dressing or undressing. Remember night air is beneficial; get all of it you can. It is preferable to sleep out of doors whilst the weather is not too severe, either in a tent or upon a balcony. Where feasible, a good plan is to contrive means by

which the patient's bed may be wheeled out of his room on a balcony or roofed porch. For those who are unable to do this--or, in fact, for any sufferer from the disease--the use of the "window-tent" will prove satisfactory. This is a contrivance like an awning, attached to the inside of the window frame, fitting down over the patient's head, while the lies in his bed, drawn close to the window. This allows the patient to breathe the pure outdoor air, whilst his body is sheltered from the cold.



TENT.

Designed by Dr. S. A. Knopf (New York) for the rest cure in the open air treatment. The frame is made of steel and is fitted with mechanism for securing it to the ground. A detachable cover is of heavy steel canvas; when not in use the frame may be folded flat.

It can be constructed cheaply with an iron frame work covered with a sub cloth, kept long enough to allow of being tucked in around the patient.

The temperature of the room should be regulated. The usual plan of keeping the consumptive in a chamber heated up like an oven is about as bad a thing as can be done to him. Warm clothing is, of course, necessary, both by day and night. But given that, and a short trial of the fresh-air treatment, and the patient soon becomes inured to any reasonable amount of cold, in fact he begins to attain an intense dislike to close atmosphere, and flees from a dusty or smoky room instinctively. It is not necessary to warn him to avoid crowded gatherings or smoky halls or theatres, or ill-ventilated public buildings. He shuns them as poison.

The second great requirement is rest. This means more than avoidance of all unnecessary exertion, hurry, straining or prolonged mental work. In the early stages of the cure, and at all times when the temperature is a degree or more above normal, absolute rest should be the rule. Remember this in connection with the outdoor treatment. Let it be absolute rest of mind and body, in the full meaning of the term. Do nothing but doing nothing. During the day, whenever and as long as the weather permits, the patient should spend his hours sitting or reclining in some bright out-of-door spot, sheltered from the wind. He should be warmly clad, and protected from draught. A comfortable reclining-chair placed on the veranda or in a sheltered part of the yard may be used in summer or winter. Whether here or when confined to the house by stormy weather, many means may be devised to occupy the time. Reading matter should be of a light, cheerful or unexacting variety. Exercise, where allowable, must be regulated by the physician, and should always be of a mild nature. Consumption is not one of the diseases that are benefited by brisk exercise. No exercise of any kind should be indulged in for half an hour before or after meals. Leisurely walking is the best exercise. Any motion that causes fatigue or shortening of breath or coughing or rapid heart-action should be shunned. As recovery proceeds more latitude may be allowed, until the patient is once more able to undertake his accustomed duties.

Diet is the third element in the cure, and one of prime importance, for without sufficient and proper food it is useless to attempt to build up the constitution so as to overcome the destructive processes going on in the body. Food must be given in larger quantities and at more frequent intervals than in health. Wasting is one of the characteristic symptoms of tuberculosis, and this wasting must be neutralized by nutritious diet. A gain in weight is one of the signs of recovery, and one of the tests by which we can measure the results of treatment. If the digestive system is already out of order measures will first be taken by the physician to remedy this. The outdoor life will work beneficially in this regard, and the appetite will usually be greatly improved.

Naturally, the state of the digestion will need to be consulted. Briefly, it may be stated that the proper diet for a consumptive is all manner and all the amount of good nutritious plain food he can digest: meats, fish, eggs, soups, vegetables, bread, cereals, fruits, butter and other fats, in fact all that go to make up a well-balanced ration.

In addition to the regular meals, raw eggs or milk in various forms should be administered as often as the digestion will permit. Often patients will declare their inability to partake of milk or eggs, but this is often fancied, and may be got rid of by serving those articles in modified

forms. Milk should never be drunk as water may, but should be taken in small mouthfuls and swallowed slowly, in order to prevent it being curdled in large masses in the stomach. Junket is a good form in which to give milk. Raw eggs may be cracked into a cup, sprinkled with a few drops of lemon juice and swallowed with the yolk unbroken. Plain egg-nog is another palatable form in which they may be given. In whatever form the food may be cooked, let it be plain and digestible. Do not use the frying pan, when you have a broiler, and do not coat every article of food with grease to make it "strong and hearty."

A diet-scheme for an average consumptive would be about as follows:—

1. On awakening, a raw egg, or a glass of hot milk or cocoa.
2. Breakfast an hour after, to be of a substantial nature, oatmeal or other cereal, with cream and sugar, meat or fresh fish, or bacon and eggs, bread and butter and milk.
3. During the forenoon, a tumbler of milk or a raw egg or some light lunch.
4. Dinner at 12.30 or 1, the most substantial meal of the day.
5. About 4 o'clock, milk or hot tea with biscuit or bread and butter.
6. Supper of a satisfying nature.
7. Before going to bed, a glass of hot milk or an egg-nog.

Eat slowly; chew your food thoroughly; don't drink too much with your meals: be cheerful at meal time, and rest before and after, and then will "good digestion wait on appetite." Plenty of good, pure water should be drunk between meals; but alcoholics should be avoided. The hands should always be washed before meals, the nails cleaned, and the mouth rinsed.

The above dietary will, of course, have to be modified to suit individual cases. In some it may be increased, in others cut down, according to the state of digestion and nutrition.



SLEEPING BAG.

Clothing, Bathing, etc.

In the matter of clothing, no rules are applicable, other than those that ought to be followed by the healthy. Well-ventilated garments suitable to the season are preferable. Too heavy clothing causes excessive perspiration, and leads to chilling of the surface. The protection of the feet is of the

utmost importance. Chilled feet are one of the commonest causes of catching cold. So-called chest-protectors are of little use. The best place to wear a chest-protector is on the feet. Garments should be loose and comfortable, and not constrict the neck or chest.



SLEEPING HOOD.

When taking the rest cure out of doors in winter the patient needs, of course, to be warmly wrapped, and at night will need sufficient bed-clothes to assure comfort. A nightcap or close-fitting hood will be necessary when sleeping out of doors. The susceptibility of the patient to cold in his early experience of sleeping out or with open windows usually disappears in a short time. Patients in sanatoria acquire wonderful powers of resistance in this way. Whilst on the subject of clothing, a word of protest may be entered against the long trailing skirts worn by some women on the street. Fortunately, the gentle sex are reforming this custom, and the vision of trailing garments sweeping

the side-walk and raising a cloud of dust behind them now seldom disgusts the eye. Such garments not only endanger others, but carry home with them a venomous load of malignant microbes to infect the house.

Cold-Water bathing, while it needs to be modified to suit the patient, is a useful means of increasing the activity of the skin, and of lessening the tendency of the patient to catch cold. It may be necessary at first in those unaccustomed to their frequent use, or people of low vitality, to use dry rubbing or sponging with alcohol. In any case, where a patient does not react well after the cold bath, where pallor or blueness or chilliness persist, the cold bath is probably harmful. In such cases, the temperature of the water must be raised nearer to blood-heat, and particular attention paid to drying and rubbing the skin, and warming the patient afterwards. Thus in many cases toleration is brought about, and the very beneficial results of cold-bathing secured.

GENERAL INSTRUCTIONS.

The sufferer should endeavour to make it his whole business for the time being to get well of his disease. Attention to details, confidence in and obedience to his medical adviser are necessary. He should avoid all bad habits, and everything in any form that tends to depress the powers of the body. Let him remember that one indiscretion may be the means of setting him back and retarding or rendering hopeless his cure. Cure will take time, and will be permanent only if he lives a clean, healthy life and remembers the lessons he has learned at so much cost. He should accustom himself to look on the hopeful side of his case, not talk about himself to anybody but his attendants, and, above all, not listen to all the "auld-wives' tales" that are brought to him about this or that wonderful cure for consumption. Let him adopt the plan that experience of thousands has shown to be the one path to health, and follow it implicitly.

Whenever any disturbance of the organs arises, such as indigestion, constipation or any alteration in the peculiar symptoms of his disease, let him draw the attention of the physician to it at once. Avoid coughing unnecessarily, and do not use tobacco. Never for a moment forget your duty to others as well as to yourself in being careful about your sputum. It contains the germs that are poisoning you, and can give others your disease. Handle it, then, as you would a poison, and see that none of it gets about. You will be known as a careful consumptive, one who has the welfare of others at heart, and people then will not shun you or fear your presence, but will continue to pour out to you the sympathy which is always ready to be given to the afflicted. Above all things, keep up courage and hope.



THE TYPE OF OPEN-AIR SLEEPING COTTAGE USED IN THE SOUTH-WEST OF THE UNITED STATES, SHINGLE ROOF, SCREENED AGAINST INSECTS, PROTECTED BY CANVAS CURTAINS.

"Let us go out into the sunshine."—*D'Annunzio*.

THIS IS THE IMPORTANT POINT AS TO CURABILITY. TO BE CURED, THE CONSUMPTIVE NEEDS TO BEGIN TREATMENT AT THE VERY EARLIEST MOMENT. IF YOU HAVE ANY SUSPICION AS TO YOUR HEALTH, CONSULT YOUR PHYSICIAN AT ONCE.



By courtesy of Dr. G. D. Porter.

MOUNTAIN SANATORIUM, HAMILTON, ONT.

For incipient and moderately advanced cases. Capacity, 66. Rates: No charges to \$10.00 per week.



By courtesy of Dr. G. D. Porter.

VERANDA, MOUNTAIN SANATORIUM, HAMILTON, ONTARIO.

CHAPTER XVI.

Directions for Living and Sleeping in the Open Air.

By THOMAS SPEES CARRINGTON, M.D.

Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis, in charge of its Bureau of Construction, and appointed Expert on Hospital Construction in the New York State Department of Health.

INTRODUCTION.

CONSUMPTION, or tuberculosis, is a disease of the lungs which is taken from others and is not simply due to catching cold. It is generally caused by germs, known as tubercle bacilli, which enter the body with the air breathed. The matter which consumptives cough or spit up usually contains these germs in great numbers, and if those who have the disease spit upon the floor, walls or elsewhere, the matter will dry, become powdered, and any draught or wind will distribute the germs in it with the dust in the air. Any person may catch the disease by taking in with the air he breathes the germs spread about in this manner. He may also contract the disease by taking into his system the germs contained in the small drops of saliva expelled by a consumptive when coughing or sneezing. It should be known that it is not dangerous to live with a consumptive if the matter coughed up by him is properly disposed of.

Consumption may be cured at home in many instances if it is recognized early and proper means are taken for its treatment. When a member of a family is found to have consumption and cannot be sent to a sanatorium, arrangements for taking the cure at home should be made as soon as the disease is discovered.

The following directions are published to help persons to carry out the open-air treatment in their own homes. Many families are unable to make any great change in their mode of living and cannot afford to fit up porches and buy extra bedding or warmer clothing. A number of the suggestions given here are very simple and inexpensive, and will help those who would like to use what they have at hand in making an outfit for outdoor life.

IT IS IMPORTANT IN THE TREATMENT OF TUBERCULOSIS, TO BREATHE AIR THAT IS FRESH AND PURE, TO EAT AN ABUNDANCE OF GOOD FOOD, TO STOP HEAVY WORK AND WORRY, AND TO TAKE A BODILY AND MENTAL REST BY LYING DOWN BEFORE AND AFTER THE NOON AND EVENING MEALS. To obtain the first, the patient must live out of doors. This means that as many hours of the day and night as possible should be spent in the open air, and in order to carry out this treatment some place must be provided which is not only protected from wind, but also from rain and snow, as nothing except the most severe cold weather should prevent

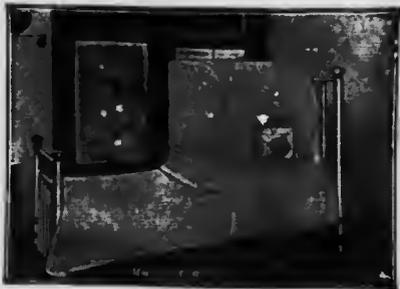
the patient from living and sleeping there. The outdoor shelter should be large enough for a bed, a reclining-chair and a table. It should overlook pleasant and sanitary surroundings if possible, as it is to be the home of the patient for months, and will give better results if comfortable and attractive.

HOW TO TAKE THE OPEN-AIR TREATMENT IN A TENEMENT HOUSE.

Tenement-house dwellers and persons living in apartment houses in large cities should make every effort possible to give the open-air treatment to a member of the family who contracts tuberculosis. First, consider the possibility of moving into the suburbs or nearby small towns. If this cannot be done, try to obtain from the landlord the use



Dr. S. A. Knopf's window tent raised when not in use.



Dr. S. A. Knopf's window tent in position, with patient in bed looking through the celluloid window into the room, but breathing outdoor air only.

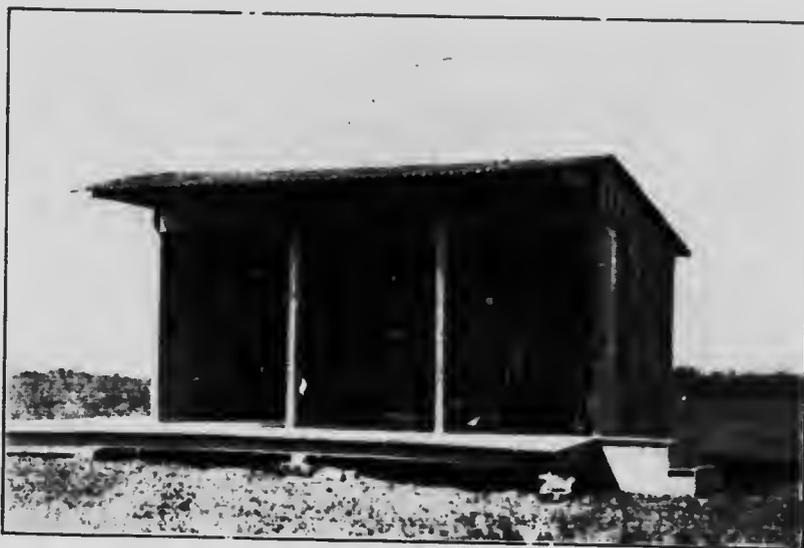
of the roof, and build a small shack there. If this is beyond the means of the family, use one room with a window opening on a street or large court for the patient, and then place the head of the bed beside the window and cover it with a window tent. The cost of a window tent is about \$10.00, and if it cannot be obtained, take two large, heavy cotton sheets, sew them together along the edge, tack one end of the double sheet to the top of the window casing and drop the lower end over the outer side of the bed, fastening the bottom of the sheet to the bedrail with tape. There will be enough cloth hanging on each side of the window to form the sides of the tent, and these should be fastened to the window casings. A window tent can be made at home for about \$3.00 by using 12 or 15 yards of heavy denim or light canvas. One straight piece of denim should be hung from the top of the window casing to the outer side of the bed, and the openings between this and the side window casings filled in with sides cut and fitted from the balance of the cloth. By these methods the patient gets fresh

air from the window and the room is kept warm in cold weather as a place for dressing and toilet purposes. During mild and warm weather, the tent can be removed and the window kept open both at top and bottom.

The flat roofs of tenement and apartment houses in large cities should, if possible, be used as a breathing place by the tenants. Shacks or cabins can be built upon them at small cost and make an economical and easily provided shelter.

HOW TO BUILD A SMALL SHACK OR CABIN ON A FLAT ROOF IN THE CITY.

Two by four timbers should be used for the frame, and siding boards for the back and sides. The front of the shack should face slightly to the east of south and be left open, but arranged with a canvas curtain, tacked on a roller so that it can be closed in stormy weather. The shack can be built cheaply with rough boards and the roof covered with tar paper or other roofing.



A simple wooden shack for a family of three which can be constructed on the roof of a tenement house or in a yard. Planned by Dr. H. E. Kirschner for the Oil City, Pa., Sanatorium.

HOW TO ARRANGE A PORCH ON A HOUSE IN THE COUNTRY.

If the family lives in a small town or in the country, it will usually be found that a porch is the most convenient way of providing open-air quarters. In selecting a site for the porch, it is well to remember that the patient should be placed out of doors in such a way that the cure can be taken with comfort at all seasons of the year. For the winter months the best place is on the south side of the house, as there will be found the greatest amount of sunshine. If this cannot be done, choose first the east, or second the west side, but not the north side except as a last resort, for it is a windy and cold position in winter. The back of the house is usually better than the front if the porch cannot be seen from the street,

but what is of the most importance is to FIND A SHELTERED SPOT PROTECTED FROM THE WIND, FOR THE WIND IS MUCH HARDER TO BEAR THAN EVEN INTENSE COLD. When a house has permanent verandas and the family cannot afford the expense of providing a special porch for the patient, the permanent veranda on any floor may be used and privacy and protection obtained by putting up canvas curtains or bamboo screens.



SLEEPING PORCH FOR HOME TREATMENT, BUILT ON VERANDA ROOF.

If a special porch for winter use is to be built, place it on the south side of the second story of the house, with an entrance into a room which can be used by the patient. For a passageway to the porch cut one of the windows down to the floor and put in a door 3 feet 8 inches wide, so that the bed can be rolled from the room to the porch without difficulty. If the room is not heated by some other means, a stove should be used and the air kept warm, so that the patient may have a comfortable place for dressing, eating and to enter when chilled. Build the porch out from the door 10 feet wide by 10 feet long and 7 feet or more in height from floor to ceiling. Place glass and sash on the side of the porch most exposed to the weather, and hang canvas curtains on rollers to enclose the open sides in stormy weather. Lay the floor with narrow spruce boards, using white lead and oil to fill in the cracks, at a grade of 1 inch to 5 feet, so that water will not stand during stormy weather. A porch of this kind can be built in small towns and in the country for from \$50.00 to \$100.00, the cost depending upon the class of material used and the way the porch is finished.

HOW TO BUILD A CHEAP PORCH.

A useful porch can be built for \$12.00 or \$15.00 with cheap or second-hand lumber, and if only large enough to receive the bed and a chair will still be effective for the outdoor treatment. The roof can be made with a canvas curtain or a few boards and some tar paper. The end most exposed to the wind and rain and the sides below the railing should be tightly boarded to prevent draughts. A window can be used for the approach, but it will be more convenient if it is cut down to the floor and a small Dutch door put in below the window-sash. Second- and third-story porches are supported from the ground by long 4 by 4 posts, or, when small, they can be held by braces set at an angle from the side of the house.



INEXPENSIVE TEMPORARY PORCH FOR HOME TREATMENT,
WITHOUT ROOF PROTECTION.

HOW TO PROVIDE A SHELTER FOR THE SUMMER AND FOR HOT COUNTRIES.

Consumptives need a good shelter in tropical countries and protection during the summer months in northern climates. A porch should be placed on the side of the house where the direct rays of the sun will not strike it during the middle of the day, and tents or shacks placed under shade-trees or in the shadow of large buildings.

Awnings which jut out from the roof of a porch or shack are used for shade, and Japanese drop curtains made of long strips of bamboo for privacy, as they do not stop the current of air.

In places where the streets are not watered, a hose should be used to lay the dust in front of the house, and the floor of the porch or shack sprinkled once or twice each day to cool the surrounding air.

The open sides of the shelter must be screened from the floor to the roof with wire netting as a protection from flies and mosquitoes, and

when this is impossible, a mosquito-bar made of cheese-cloth, netting or serim should be hung from the roof or laid over barrel-hoops attached to the head and foot of the bedstead.



THIS IS A GOOD WAY TO ARRANGE A NETTING AS A PROTECTION FROM INSECTS. Notice the barrel hoops tied to the bedstead. (Loaned by the "Journal of the Outdoor Life.")

TENTS AND TENT HOUSES.

Tents and tent houses can be used as a shelter in warm, dry climates and for the summer months in northern countries, but they are not very satisfactory for winter use in cold climates.

In order to make a tent comfortable for a sick person, it should have a large fly or double roof with an air space between, a wide awning in front where the patient can sit during the day, a board floor laid a few inches above the ground, and the sides boarded up two or three feet from the floor.

THE BED AND BEDDING USED IN OUTDOOR SLEEPING.

An ordinary iron bedstead with woven wire spring 3 feet 6 inches wide and a moderately thick mattress are all that are necessary except for very cold weather. A bedstead which can be rolled about easily is a great convenience, and should therefore be fitted with small rubber-tired wheels or casters. A good hair mattress is most desirable, but when it cannot be obtained, a cotton-felt mattress can be bought for as low as \$4.00, or a wool mattress for about \$10.00. In northern climates, where cold weather must be expected, two mattresses with several layers of newspaper between them are often used. Over the mattress place an old blanket or a cotton

bed-pad, the same width as the mattress, and on this the ordinary bed-sheets or blanket-sheets.



AN EMMANUEL CHURCH CLASS PATIENT TAKING THE OPEN-AIR TREATMENT IN A BACK YARD OF A BOSTON TENEMENT.

BED COVERS USED IN OUTDOOR SLEEPING.

Persons who like heavy bed covering may use blankets, placing as many layers over the bed as desired for warmth. Those who cannot stand heavy covering can use down comforts, as they are very warm but light. If these are too expensive, lamb's-wool or cotton-filled comforts can be bought, or the material for wool or cotton quilts can be obtained for about \$2.00 and warm, satisfactory covering made in the home. Very cheap, light, but warm covering can be made by using paper blankets placed between two thicknesses of outing flannel or bed covers. These paper blankets are sold for 50 cents each and wear for about six months. A woollen horse blanket with an outside of canvas can be used as a covering to protect the bedding in wet and stormy weather.

SLEEPING-BAGS.

In very severe weather a sleeping-bag may be used for patients who are very susceptible to the cold. These bags can be bought at department stores for \$15.00 upward, or can be made at home by sewing blankets together around the edges, leaving the top open. In making a bag, use as many layers as may be desired, but place the same number of thicknesses on both sides of the bag. The blankets should be 7 feet long by 4 feet wide.

ARRANGEMENT OF PILLOWS IN OUTDOOR SLEEPING.

Two pillows should be used in preparing the bed before retiring. Place them in the form of an inverted V, with the apex at the top of the bed and the head at the point where the two pillows meet. This position allows the shoulders to nestle between the pillows and protects them from the cold wind which will otherwise find its way under the bed-clothes when the patient lies on his side or turns over.

HOW TO PREPARE THE PATIENT FOR THE NIGHT.

In cold weather the outdoor sleeper should get into the bed in a warm room and have someone roll him out of doors. When this cannot be done, use a warm dressing-gown in going back and forth from the dressing-room to the porch, and warm the bed by placing in it for a few minutes before retiring, a hot-water bag, hot bricks, soap-stones or bottles filled with hot water. In some instances it is well to leave a hot stone or bottle wrapped in flannel at one corner of the bed, where it will throw off heat slowly during the night.

In tucking in the patient at night, all covers except the top blanket or comfort should be tucked in under the bed-pad which lies on the mattress. The topmost cover is then tucked under the mattress to keep the under covers from sliding off when the sleeper is restless. This method of tucking in forms a sort of sleeping-bag with the bed-clothes, known as the Klondyke bed, and prevents the cold air from reaching the body.

CLOTHING WORN AT NIGHT.

The night clothes worn by the outdoor sleeper during the winter depend largely upon the strength of the patient. Some persons need much more than others, but even the weakest can usually keep warm if they have blanket-sheets and hot bottles. A woollen undershirt, a sweater and a long outing flannel nightgown or bathrobe are usually worn, but in very cold weather some patients wear a pair of drawers made of flannel, a pair of bed-socks or knitted slippers, and a woollen abdominal bandage.

HOW TO PROTECT THE HEAD FROM DRAUGHTS.

The head of the bed should be shielded from the wind or a strong draught by placing it close to the protected end of the porch, or by covering it with a canvas hood supported on a barrel-hoop attached to the bedstead or hung by a rope from the ceiling. The patient can wear a knitted skull-cap long enough to be pulled down to the end of the nose and over the ears, or a knitted helmet which covers the whole of the head, face and neck, with the exception of a small opening for the nose and mouth. A hood shaped like an old-fashioned sunbunnet is very comfortable, and can be made at home from eiderdown or outing flannel by using as many thicknesses as may be needed. NEVER COVER THE HEAD WITH THE BED-CLOTHES. If the nose grows cold, use a small piece of flannel, held by elastic bands from the ears, to cover the top, or a piece of cotton held in place by a strip of adhesive plaster. Care should be taken not to interfere with the inhaling of fresh air or to allow the

breath as it is expelled from the nose or mouth to come in contact with the cloth and form icicles. Chapping of the face during the night can be prevented by using cold cream or vaseline about the nose and lips.

CLOTHING FOR DAY USE.

The clothing for use during the day when the patient is up or sitting in a reclining-chair should be of light weight but warm. Underclothes of half cotton and wool or linen mesh, and a sweater which buttons in front, with the ordinary outer clothes, are usually worn. The overcoat for men, women and children should be of fur if possible, as even the cheapest of skins are warmer than any other kind of garment. If a new coat cannot be bought, a heavy cloth overcoat will give good protection, and be much warmer if it has a high, soft collar. Leather leggings and woollen tights are used as extra garments, and are a great comfort when taking exercise on cold days.

HOW TO PROTECT THE HANDS.

Patients who wish to use their hands while sitting out of doors in cold weather can wear thin, well-fitting cotton gloves. These are used by army men, and can be bought for 30 cents a pair. Over them should be drawn a knitted woollen glove with the ends of the fingers and thumb



I. HOW TO WRAP A PATIENT IN A CHAIR.

The reclining chair is first overlaid with a rug or a comfortable, and double blankets extended their full length, leaving the free ends on the floor. (Lent by the "Journal of the Outdoor Life.")

cut off and bound to prevent unravelling. For ordinary protection, when not at work, a heavy fur or woollen mitten should be worn with long, woollen wristlets. Never use tight gloves of any kind in cold weather, as they restrict the circulation of the blood and cause the hands to grow cold.

HOW TO PROTECT THE FEET.

Use woollen stockings, and if they cause irritation, wear a cotton stocking next to the skin. Sometimes two or more pairs of woollen stockings are necessary in very cold weather, but they must always be large enough to fit loosely. Felt shoes are warm and light, and are much used. Soft leather shoes covered by large fur-lined leather shoes are very warm and comfortable, but are expensive, as they must be made in a set, to order. Foot-muffs should be used in sitting out during a cold day. They are made of fur or of cotton quilts sewed up like a bag, into which the feet can be placed. On very cold days the muff can be placed in a wooden soap-box with hot bricks beside it, and newspapers wrapped about the muff to fill in the empty space.

CHAIRS FOR DAY USE.

An easy-chair is a great comfort to the patient during the day. A steamer chair is easily obtained and gives good service, and the canvas



2. HOW TO WRAP A PATIENT IN A CHAIR.

After seating yourself, draw up the free ends of the blanket and tuck in at the sides. A steamer fur is placed over all. (Loaned by the "Journal of the Outdoor Life.")

chair with a wooden frame can be bought for \$1.00, or the cane-seat extension-chair for \$2.50 up. A more durable chair is made for this purpose with an iron frame, costing about \$25.00, which can be transported and used in a rough manner without danger of breakage. To prevent the cold currents of air reaching the patient from below the chair must be covered with some thick, closely woven, warm material. A fur rug is the best for this purpose, but several layers of blankets and newspapers will answer and are more economical.

TABLE FOR WORK AND AMUSEMENT PURPOSES.

The patient should have a table handy on which to keep books and other things used for amusement or work. An adjustable table, the top of which the patient can swing before him or away, is a great convenience, and can be used as a book-rest when the hands are under cover.

GENERAL DIRECTIONS FOR THE CARE OF THE PATIENT.

The directions for the care of the patient are not intended in any way to take the place of a physician's orders. Every consumptive should consult a doctor, and these suggestions are given to help the patient carry out his directions. Rest is a most important part of the open-air treatment, and exercise must be regulated by the doctor. Always have at hand an extra wrap, and never remain out if chilled. Cold weather should have a bracing effect, and when it does not, go into a warm room and get a hot drink, preferably milk, remaining indoors until comfortably warm. When going out again use more wraps, and keep behind a shield or screen that breaks the force of the wind. Always be cheerful and hopeful; never waste your strength in anger or by being cross. Lead a temperate life, go to bed early and get up late; do not use alcohol in any form except when prescribed by your doctor. Do away with tobacco if possible, and use only weak tea and coffee in small quantities. Never swallow the matter coughed up, but always destroy every particle by spitting in a paper or cloth which can be burned. Never allow the hands, face or clothing to be soiled by sputum, and if this happens by accident, wash the place soiled with soap and hot water. Men who have consumption should not wear a moustache or beard unless it is trimmed close. Particular care must be taken, when sneezing and coughing, to hold in the hands before the face a cloth which can be burned. Soiled bed-clothes, night-dresses, other washable garments and personal linen should be handled as little as possible until they are boiled prior to their being washed. The dishes used by the patient must be boiled after each meal.

All the above means care and work, but must be done both as a protection to the household and in order to bring about a speedy cure for the patient.

"Public health is the foundation on which repose the happiness of the people and the prosperity and power of the country." *Haber*.



By courtesy of Dr. G. D. Porter.]

PREVENTORIUM AND OUT-DOOR SCHOOL, HAMILTON, ONT.



By courtesy of Dr. G. D. Porter.]

PREVENTORIUM AND OUT-DOOR SCHOOL, HAMILTON, ONT.

Provided by the Ladies' Auxiliary Board of the Hamilton Health Association for incipient cases of tuberculosis among children. The Board of Education provides a public school teacher and schoolroom equipment. Capacity sixteen pupils and accommodation for nurse and teacher.

"In our endeavour to find methods to prevent tuberculosis we must give the period of childhood much more attention than it has been wont to receive for it is not only possible, but probable, that the seeds which ripen into full-fledged cases of tuberculosis in later life were in very many cases implanted in the tissues during the period of childhood, remaining there until a favorable time appeared for their activity." —
DR. POTTINGER.

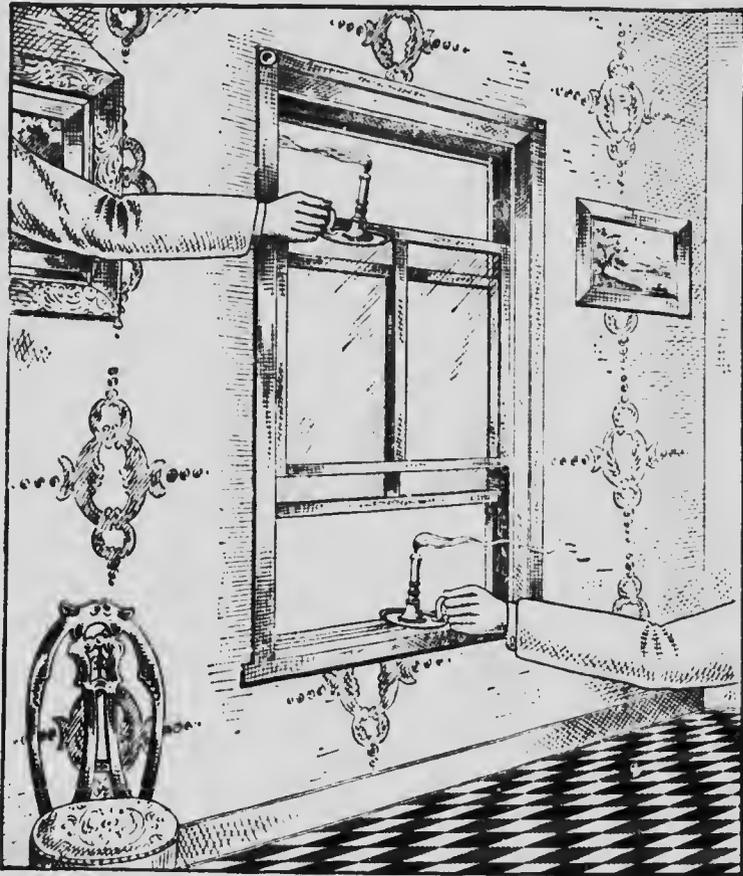
CHAPTER XVII.

Schools and School Children.

TO begin with the children, the miniature men and women, the future fathers and mothers, the citizens of the coming day, to train their bodies in the right direction, to develop their powers of resistance against disease in later years, and to teach them how to be healthy and strong this would seem to be the proper foundation for any concerted campaign against preventable disease. The opportunity provided by the public schools is plain to everybody. Here we have the children gathered together for instruction under the control and guidance of those to whom they look for teaching and precept, greedy to learn and ready to absorb the lessons we give them. It is too true that until a very recent period our educational system was almost entirely devoted to development of the mental faculties, while the training of the body was neglected. But reform has been active there as elsewhere, and a dawn of a new day seems to be breaking. The study of hygiene is placed in the school curriculum, and the *Journal of Education* contains a long series of articles on School Sanitation and the Tuberculosis problem, including a very useful Catechism.

The duties of the teacher and of the school trustees are there laid down. In the first place, we owe it to the children that the rooms in which they are confined for so many hours of the day shall be clean and airy and bright. The dingy, dirty, unpainted barns that disgrace so many of our towns and country places ought to be done away with. Clean and bright and tidy school-houses will help to make clean and bright and tidy children, and to teach them refinement, good manners and decency. Let us remember, too, that in the schools are gathered together the most crowded collections of human beings in the land. Infection is easily spread amongst them, not only of the acute infectious diseases, but of the more chronic ones. Just as one child may scatter the germs of scarlet fever or diphtheria amongst the others, so may a tubercular pupil or a tubercular teacher endanger the health of every member of the school. Where forty or fifty or more children are peened up in one close room this is a very serious matter, especially when, as we know, they come from so many different types of environment. Great responsibility, then, rests on the teachers; and, moreover, great opportunity for good is theirs. We appeal to teachers especially to do what they can to help us in the tuberculosis campaign. We ask them to study carefully the instructions printed in the *Journal*, and to remember that the Department of Education has an active interest in seeing that these are carried out. We have the assurances of members of the Council, of the Education Office, and of the Inspectorial Staff of their backing in this part of the work. We ask them to take full advantage

of the guiding and authoritative influence which they possess over their charges; to realize that the child is very impressionable, that he will receive ideas easily and retain them strongly when set forth with vigour and reiteration, and especially by example. Great use can be made of the imitative and mutually corrective habits of children. We ask the teachers, then, to read and follow the directions laid down for the



By Courtesy of Board of Health, Salem, Mass.

A LESSON IN VENTILATION.

On a calm, cool day, when there seems to be no current of air, the direction in which the air moves in a room can be shown by holding a lighted candle before an open window or door: when the candle is held low down the flame will point into the room, and when held up high it will point out.—*Committee for Prevention of Consumption of the Associated Charities, Wash., D.C.*

cleanliness of the schoolroom and to carry out the admonition to read and explain the Health Rules and to set the example in their own persons. If it so happen that any child seems to be suffering from tuberculosis, the attention of parents and trustees should be called to it. Failing health or lowered vitality, mouth-breathing or evidences

of "scrofula" would suggest reference to parents in any way that would be void of offence. Opportunity can be frequently found for impressing on pupils the importance of details of home and personal hygiene, the meaning and causes of disease, and particularly with regard to our especial subject. It is intended that provision shall be made by the Anti-Tuberculosis Society, with permission of trustees, for short talks to school children by physicians and others interested in the work. Let it be the especial care of the teacher to see that the schoolroom is kept clean, bright, well aired and properly warmed and ventilated, and to seek the co-operation of the trustees in making it so. Should the schoolroom become dirty, or the outbuildings and premises be in an unsanitary condition, through the neglect of the trustees or those in charge, it should be reported to the inspector at once, if those responsible fail to act.

No single measure in the way of prevention of tuberculosis and in general of improving the healthfulness of our people, seems to us to equal in usefulness a systematic inspection of schools and school children. We have repeatedly dwelt upon the importance of a healthy childhood in achieving a healthy adult body. It is a fact that the disease is very frequent in childhood, much more so than is often supposed, and that the greatest frequency of its occurrence is between the ages of 5 and 15. It is true that in these early years tuberculosis affects the glands and bones and other parts of the body more often probably than the lungs. But, none the less, it is tuberculosis, and the disease often lies dormant in these parts ready to break out into greater activity later on. If, then, we are to do our duty in this matter, we must see that we remove all the obstacles we can to giving the child a chance to acquire a healthy body. From a purely medical standpoint a general and regular inspection of all school children would fulfil many important functions. Such inspection would necessarily require to be carried out by a medical practitioner, and should be more than perfunctory.

Objections as to cost should not be given very great consideration. There can be no question but that the cost would be more than repaid by the good done, apart from the fact that early discovery of bodily defects or incipient disease would save very great future expense to parents. Let it be stated here that medical inspection of schools is at present being carried out in a vast number of towns and cities all over the world. The results of inspection have been everywhere productive of surprising discoveries as to the prevalence of maladies and defects in children, and of the most striking benefit achieved by their alleviation. The duties of such inspectors would lie along some such lines as the following:—

(1) To supervise all matters pertaining to the sanitation of school buildings; with power to remedy defects.

(2) To institute an examination of the health of pupils and teachers, paying attention particularly to infectious maladies, defective teeth, diseased glands, joints or bones, the presence of adenoids, enlarged tonsils, defective hearing and sight, mental deficiency or backwardness, anæmia, etc., or uncleanliness, and to report cases where such conditions exist to their parents for correction.

(3) Instruction by printed rules or short talks on matters of health, bad habits, avoidance of alcoholic beverages, and in general, the carrying out of a general supervision of the physical welfare of the growing child.

In connection with this matter, we feel that the re-publication here of the following extracts will prove of interest to the public. They are taken from the *Journal of Education*, issued by the Superintendent of Education for Nova Scotia, and include, besides general comments by that officer, portions of the reports of the Medical Inspectors and of the Committee on dental examination of the Halifax schools. These reports deal, not with the children of some foreign land, with the more degenerate types found in many of the European cities, but with our own people, and represent the results of a thorough but conservative estimation. Conditions fully as undesirable are known by those familiar with the subject to exist in a greater or less degree amongst the children in the other schools of the province.

MEDICAL AND DENTAL INSPECTION OF PUPILS.

(Reprinted from "The Journal of Education.")

Some extracts are given below from the reports of the medical and dental inspectors of the pupils in the Halifax Schools, for the purpose of aiding teachers, trustees and parents throughout the country, to think of the great importance and the little cost of arranging, as the law now allows school boards to do, to have the children in the school examined once or twice each year by the best medical man in their neighbourhood.

The small cost for which this can be done all over the country is nothing compared with the amount of lifelong suffering which may be obviated in the case of a few in every school, and the added years of healthy life which are likely to be secured for many of the pupils. This is really more necessary in the country than in the towns, where doctors and dentists are always within easy reach. But even in Halifax, with all these advantages at a maximum, there have already been hundreds of boys and girls saved, who unknown to their parents were undergoing physical degeneration which would soon have made life a burden or cut it short. And still a greater number, not knowing what was wrong with them, or not knowing that a serious menace to health, vigour and future success had already set in, had their attention, and their parents' attention, called to their condition in good time. When we are spending so much money in bringing foreigners to fill up our country, how much more should we be willing to spend the small amount necessary to keep our own sons and daughters alive, in good health and vigour.

Parents! discuss this at your next annual meeting. Don't let the month of June pass without considering it. Authorize your trustees to arrange with the best local medical man to inspect and report upon the health of each pupil at school. At the following annual meeting pay close attention to the medical officer's report, and see, even if you have been so fortunate as to have received no benefit on account of the perfect health of your own children, if there will not be several cases in which candidates for a broken-down or weakened life have gained a chance for a vigorous and useful life. Each such saved boy or girl is of more value than a foreign immigrant - very much more, for they are our own people. Instead of being invalids on our hands they will be helpers. The cost of these precautionary measures will be a mere bagatelle compared with the life, light and labour saved in the school section.

Here are some figures from the Report of Drs. Cunningham and Doyle, who had charge of one-half of the Halifax City Schools:—

NUMBER EXAMINED, 3,050.

Anæmia	-	-	2.4%	Defective hearing	-	-	2.1%
Enlarged glands	-	-	6.6%	Discharging ears	-	-	.5%
Cardiac diseases	-	-	.2%	Defective nasal breathing	-	-	5.5%
Pulmonary diseases	-	-	.7%	Deformed palate	-	-	.1%
Skin diseases	-	-	1.0%	Hypertrophied tonsils	-	-	7.4%
Deformities	-	-	.3%	Post-nasal growths	-	-	3.4%
Defective vision	-	-	8.1%	Under treatment	-	-	2.4%
Inflamed eyes	-	-	7.8%	Treatment recommended	-	-	10.2%

It will be seen that the largest percentages are reached by the eye defects, viz., inflamed eyes and defective vision. The necessity of prompt attention is obvious in this regard, most of the defects being acquired and not hereditary, and tend to become worse unless corrected.

The next highest percentages are the so-called catarrhal troubles—defective nasal breathing, enlarged tonsils, post-nasal growths, with their results—enlarged glands, and the still more serious affection of hearing. These figures would suggest the necessity of a careful examination, and of some method of ensuring prompt and proper treatment. It will be seen that only 2 per cent. are at present receiving proper attention, while over 10 per cent. are in need of it immediately. Recommending pupils for treatment has been done in a very conservative fashion—only when absolutely necessary, and cases where the slightest doubt exists being postponed till the next examination, when we hope to have a wider scope.

Dr. Woodbury, Medical Inspector of the Schools in the other half of the City, has the following extracts in his report:—

An individual examination has been completed of each pupil present in every department of the schools allotted to my care, representing roughly one-half of the pupils in the city, and results noted in the card index, the tabulated results of which are as follows:—

Pupils suffering from—	Year 1908.
Anæmia	143
Enlarged glands	91
Chorea	6
Cardiac diseases	41
Pulmonary, including bronchial diseases	63
Skin diseases	71
Deformities	57
Defective vision	372
Inflamed eyes	32
Defective hearing	40
Discharging eyes	10
Defective nasal breathing from various causes	75
Deformed palate	5
Hypertrophied tonsils	327
Post-nasal growths	46

Pupils are constantly leaving school for various reasons, and others take their places, which renders it difficult to make mathematical comparisons. A few explanatory remarks will therefore be in order.

The great increase in cases of enlarged glands, almost three times the number in last year's report, is due largely to the prevalence of infectious diseases.

The figures for pulmonary, bronchial and cardiac diseases are not so accurate as they might be were we always able to examine in a room which is warm enough to permit of the removal of a part of the child's clothing. This cannot be done in a hall, passage, or cloakroom.

Tuberculosis does not ordinarily manifest itself in the lungs of children of school age.

The increase in skin disease and deformities is due largely to more careful search and an increasing knowledge of many of the children in their homes, in private and dispensary practice. Several cases of deformity are now under treatment.

The decrease in the number of children suffering from inflamed eyes is largely the result of treatment. This is a visible defect, therefore more likely to be remedied when the attention of the parents is called to it.

The number suffering from defective vision is about the same as last year. The figures, of course, include many who have adopted treatment, and are wearing glasses. Their vision without glasses is, of course, in most cases still defective, they are therefore included in the figures from year to year.

The decrease in the number of pupils having discharging ears is largely the result of treatment.

It is, of course, very difficult or impossible to ascertain from many of these children whether treatment has been adopted. The good results accruing from reporting these cases to the parents are far beyond anything we can estimate in figures.

Every school was visited during the autumn months, and teachers and pupils were given brief instructions with a view to the prevention of contagious diseases, particularly diphtheria. The throats of hundreds of children were examined personally, resulting in the temporary exclusion of many suspicious cases. A circular was prepared for the teachers, giving some directions for the prevention of diphtheria and the exclusion of mild cases from the schools.

All teachers submitted to me have been examined as directed for pensions, leave of absence, etc., and written reports of each case sent to the Board. Special examination was also made of children sent to my office by the truant officer.

Constant vigilance has been exercised with a view to the betterment of sanitary conditions in school buildings and classrooms, and recommendations made from time to time.

The question of the disposal of the disease-carrying dust which accumulates in the ordinary schoolroom is one which calls for immediate and careful consideration. It might be in the interests of the health of the community if the School Board could see its way clear to become

the owner of a well-equipped vacuum cleaning plant, and in this way largely dispose of the germ-laden dust which infests the atmosphere of our school buildings.

A little observation has shown that many pupils, as the result of domestic conditions, are in the habit of coming to school each morning without having partaken of any food whatever, or having had only a very early breakfast consisting of bread and tea alone. Effective work is a physical impossibility for these underfed children. This is a problem which must be met sooner or later if we are to get the best results. In cities where something has been done in this direction, it is said that the great majority of the pupils, regardless of their domestic circumstances, and many of the teachers are clearly benefited by a small quantity of hot liquid or solid food supplied at the school, especially at some period during the long morning session.

SIMPLE RULES FOR SCHOOL CHILDREN TO PREVENT TUBERCULOSIS

Every child and adult can help to prevent tuberculosis. School children can be helpful by complying with the following rules:—

Do not spit except in a receptacle made of cloth, or a handkerchief used for that purpose alone. On returning home have the cloth burned by your mother, or the handkerchief put in water until ready for the wash.

Never spit on a slate, floor, playground, or sidewalk.

Do not put your fingers into your mouth.

Do not pick your nose or wipe it on your hand or sleeve.

Do not wet your fingers in your mouth when turning the leaves of books.

Do not put pencils in your mouth or wet them with your lips.

Do not hold money in your mouth.

Do not put pins in your mouth.

Do not put anything in your mouth except food and drink.

Do not swap apple cores, candy, chewing-gum, half-eaten food, whistles, bean-blowers, or anything that is put in the mouth.

Peel or wash your fruit before eating it.

Never sneeze or cough in a person's face. Turn your face to one side or hold a handkerchief before your mouth.

Keep your face, hands and finger-nails clean. Wash your hands with soap and water before each meal.

When you don't feel well, have cut yourself, or have been hurt by others, do not be afraid to report to the teacher.

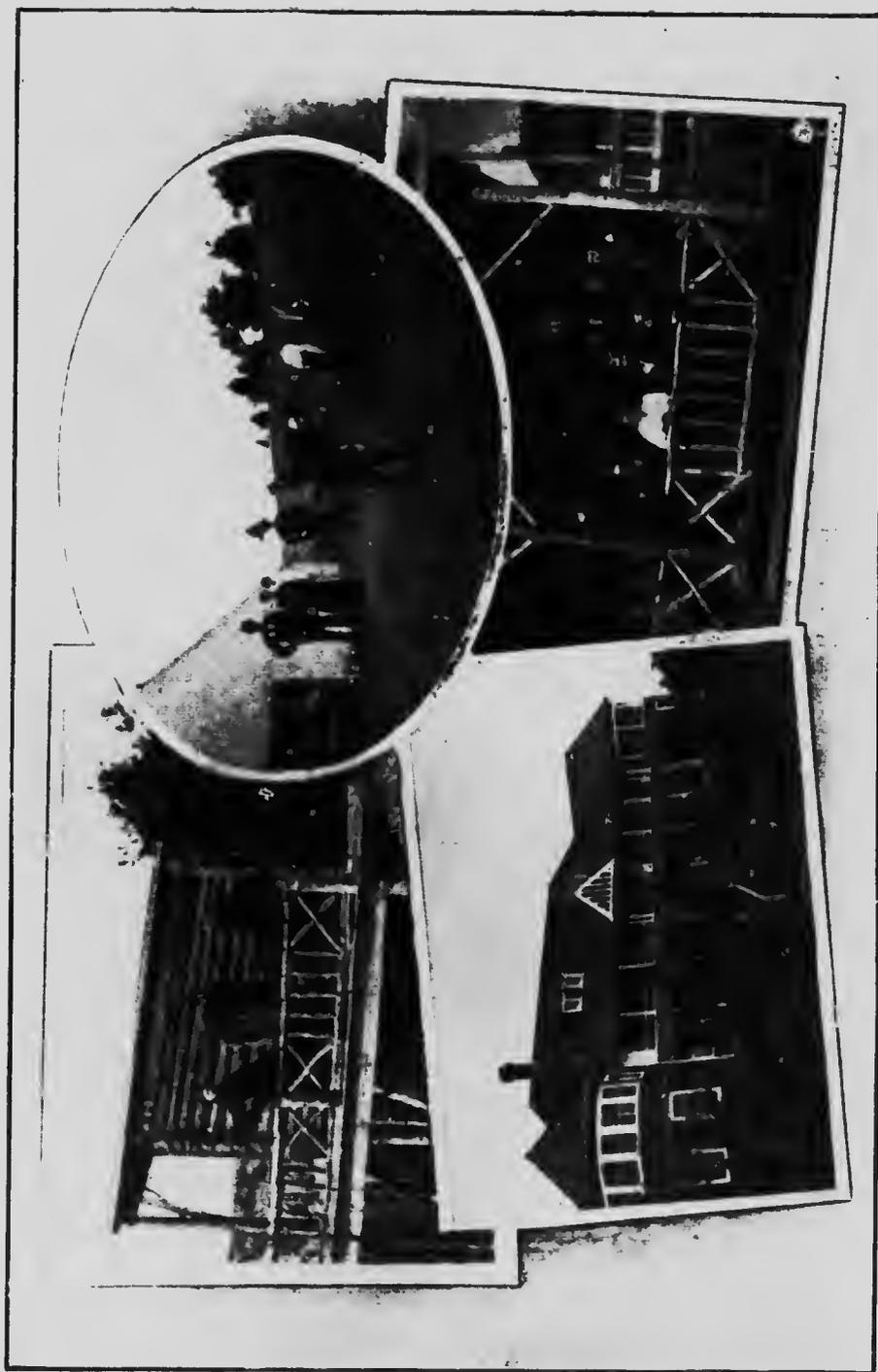
Keep yourself just as clean at home as you do at school.

Clean your teeth with toothbrush and water, if possible, after each meal; but at least on getting up in the morning and on going to bed at night.

Do not kiss any one on the mouth or allow anybody to do so to you.

Learn to love fresh air and learn to breathe deeply and do it often.

"Keep your face always toward the sunshine and the shadows will fall behind you."—*M. B. Whitman.*



THE PROVINCIAL SANATORIUM, KENTVILLE, NOVA SCOTIA

CHAPTER XVIII.

Public Control.

BEFORE turning to the consideration of this part of the tuberculosis problem, let us take a view of the present state of legislation dealing with the subject of public health. As a matter of fact the law-makers of our Province have provided us with a very advanced and enlightened Health Act. As amended and consolidated at the last session, it is comprehensive and stringent, and capable of covering a large part of the needs that arise. Inasmuch, however, as the manner of publication of the Statutes prevents their coming to the knowledge of the great majority of the people, it seems advisable to print here a synopsis of such parts of the Act as are of interest to every citizen, not only those which deal directly with tuberculosis, but those also which bear indirectly upon this particular matter. These extracts will, we hope, be the means of informing a large part of the public as to their duties and rights, the extent to which the individual is protected by law, and the machinery by which the Act is enforced.

Almost unlimited powers are given to the properly constituted local health boards in dealing with contagious diseases and sanitary affairs in general. For example, they may make and enforce under penalties such regulations as occasion requires, not inconsistent with the laws of the Province, whenever any infectious disease has been introduced, or there is imminent danger of its introduction into any place. They may remove infected persons to a suitable place, or otherwise isolate them. They may order the vacating of any dwelling-house, so unfit for that purpose as to endanger public health, or they may require the owner or occupant to remove the cause of complaint when it appears to the board that any building, cellar, lot, or vacant ground, is in a state likely to endanger the public health. It is the duty of the duly appointed medical health officer of the town or municipality to enforce the sanitary laws of the Province and the local regulations, to cause the remedying of all nuisances and regulate sanitation in general. He is empowered when led to believe in the existence of any infectious or contagious disease in any house or locality, to inspect it, to send infected persons to a hospital or pest-house, to isolate the house or locality. He may close the schools and prohibit public gatherings on the outbreak or threatened outbreak of any epidemic. Sanitary inspectors shall be appointed who shall have charge, subject to superior authorities, over all streets, highways, passages, docks, wells or other water supply system, vaults, privies, vessels, wharves, and other places, as to the control and remedying of nuisances and filth, or any condition dangerous to public health.

General clauses of the Act provide penalty for bringing infected persons into the country; direct the placarding of infected houses, the

furnishing of all houses with drains and privies; the yearly cleaning out of all wells, public or private; penalize the depositing of offensive matter, the selling or offering for sale of unwholesome, stale or decayed food. Every householder who knows of the existence of any infectious or contagious disease in his family or household must notify the local board. Members of such household shall not attend school until permitted, and any school teacher who has reason to suspect that any pupil has such a disease or lives in an infected house shall notify the board and prevent the attendance of such a pupil until a clean bill of health is given. Physicians attending any person having a contagious or infectious disease must notify the local board within 24 hours after learning the fact.

All milch cows and cow byres, dairies, cheese-factories, creameries and slaughter-houses shall be subject to regular inspection. No person shall keep a dairy or place in which milk is sold or kept without permission of the local board after their approval and inspection, and then only as subject to conditions as to cleanliness and sanitation.

No person shall sell or offer for sale as whole milk any milk that contains more than 88 per cent. of watery fluids, or less than 12 per cent. of total solids, or less than 3 per cent. of butter fat; or skimmed milk containing less than 8½ per cent. of total solids, other than butter fats; or cream containing less than 15 per cent. of butter fat; or buttermilk not the product of pure and wholesome milk. The cleanliness of ice sold for domestic use is controlled.

Those sections of the Act which deal directly with tuberculosis we will reprint entire, in order that the public may appreciate the strong stand of our legislators upon the subject, and that they may be informed as to the opportunities provided by law for municipalities, cities and towns to cope with this disease.

TUBERCULOSIS.

44.—(1) Every medical practitioner shall report in writing to the medical health officer on a form to be furnished for the purpose, the name, address and occupation of every person having tuberculosis whom such medical practitioner has been called upon to visit professionally, together with such particulars of the case as may be required.

(2) Such report shall be furnished within two days after such medical practitioner has ascertained the fact of such disease.

(3) Any medical practitioner who shall neglect or refuse to report any case of tuberculosis as required by this section shall be liable for every such offence to a penalty not exceeding \$50.

45. The medical health officer shall cause all reports made in accordance with the preceding section to be entered in a register kept for the purpose. Such register shall not be open to inspection by any person other than health authorities or officials, nor shall the name or identity of any person mentioned in any such report be divulged, except as may be necessary in the interest of the public health.

46.—(1) Every medical practitioner, whenever he becomes aware of the death or removal from any house or premises of any person having tuberculosis, shall forthwith notify the medical health officer of the said death or removal, in order that the necessary cleansing and disinfection of the premises may be carried out.

(2) No person shall let or hire any house, or part of a house, which has been occupied by any person having tuberculosis, until the said house or part of a house has been disinfected and cleansed to the satisfaction of the medical health officer.

47.—(1) The council of every city, town or municipality, either singly or in co-operation with any other or others of the cities, towns or municipalities within the same county, may by law, subject to the approval of the Governor-in-Council, establish and maintain local hospitals or sanatoria for the accommodation and treatment of advanced cases of tuberculosis, and is hereby authorized to borrow on the credit of such city, town or municipality such sums of money, from time to time, not exceeding \$10,000 in the whole, as may be required for the purposes of the establishment and equipment of such a local hospital or sanatorium. Provided, however, that the municipality of the county of Cape Breton is empowered to borrow for this purpose from time to time any sum or sums not exceeding in the whole \$50,000.

(2) For the purposes of effecting any loan hereby authorized, the council is empowered to make and issue, subject to the provisions of "The Municipal Debentures Act, 1902," from time to time, as the council may deem expedient, the debentures of the town or municipality, each in the sum of \$100 or a multiple thereof, bearing interest at such rate as the council may determine, not exceeding five per centum per annum, and redeemable at a period not exceeding thirty years from the issue thereof.

(3) Such local hospitals or sanatoria shall be subject to such rules and regulations for their management as may be prescribed by the town or municipal council, and approved by the Governor-in-Council.

48. The expenses necessary for the proper care and treatment of persons suffering from tuberculosis, who are receiving aid under the poor laws, shall be a charge on the municipality or town wherein such person has a settlement.

49. The council of every city, town or municipality is hereby authorized and empowered to grant aid to—

(a) any society or league formed with the object of preventing or mitigating tuberculosis, or,

(b) any sanatorium established for the care of tuberculosis,

in such amounts as the council may from time to time determine, and to vote and collect rates therefor in the same manner as the ordinary rates and taxes are rated and collected.

50. No person suffering from advanced pulmonary tuberculosis shall knowingly engage personally in the handling of foodstuffs, nor shall any employer knowingly employ anyone so suffering in any business or occupation requiring the handling of foodstuffs by such employee.

Little comment is needed here upon these latter enactments. A perusal of the obligatory sections will convince the reader that they are reasonable. The matter of the report and registration of tubercular patients is of prime importance. All investigators agree upon this. Objections that might possibly be raised are obviated by keeping the register secret from all except those directly interested. When considered advisable, the health officer should visit the patient and investigate the conditions under which he lives, see that sanitary precautions are observed, and that medical and nursing supervision are supplied.

Such inspection is needed in order that it may be ascertained whether the patient is being properly taken care of and also whether his sputum is being destroyed. Fortunately every case does not require official interference, but there are many cases where it should be insisted upon in the interests of others.

Equally important is the matter of disinfection of the habitations of consumptives, and the prevention of their re-occupation until so disinfected.

Ordinances against indiscriminate spitting in public places should be instituted everywhere, properly advertised, and, what is more important, acted upon. There is already a great improvement in the extent of this pernicious practice, but a few fines would be effectually persuasive.

Inspection of schools and school children, another field for municipal control, is referred to in another chapter. The inspection of gaols, asylums, hospitals, and of factories is already in the hands of provincial officials. That of lodging-houses, theatres, and other public buildings, demands the attention of town authorities. To sum up these aspects of the question, the public can appreciate the fact that as far as laws go we have already a very capable set of enactments; whatever else is lacking to cover the ground can readily be provided. It rests with the public to see that these laws are carried out. The time is coming when we will look back in amazement on the indifference displayed in these days to things of such grave importance. The spread of knowledge, however, and the rapidly increasing interest taken by a large part of the people betokens an awakening from this state of supine endurance of evils which we could end in a few days if we but chose. It requires a few leaders in each part of the community, a little rallying, a little impetus added to the movement, and the reform will go on. What the people desire, that will they get. Let us see that things are done. The public are after all only you and I and the other individuals of the land, and public health is your health and my health, and the health of our friends around us.

We have health boards, though to tell the truth, they exist in many places only in name, and only come into visible existence when some virulent epidemic arises. What we want is active health boards, boards that will administer the laws and regulations as they stand. But the people must back them up. Theirs is a thankless, unpaid job in general, and its carrying out is often unpleasant. Yet if they can be made to realize that the public are strongly with them, their task will be made easy, and they will feel that they are doing a beneficent and acceptable service. And we believe that to be the state of feeling now amongst the thinking part of the public. Public sentiment is growing stronger every day in matters of health. Everybody is beginning to wake up to it. Even the call for the publication of this booklet is evidence of the fact.

The need and value of supervision and control of matters pertaining to sanitation are subjects of every-day discussion everywhere. Let us insist that health authorities do more than occasionally quarantine a victim of small-pox or diphtheria. And as for the health authorities themselves, chosen as they are from among the most intelligent part of their communities, we believe that they only await the call from the

public to act with vigour and to attack these problems along modern lines.

What we ought to have, and what we will have some day, before many years we hope, is the appointment of adequately paid medical health officers devoting their entire time to the duties of the office. Physicians with special training in this department should be engaged, and could render services of incalculable benefit to their community.

One other subject we have reserved to the last, namely, the necessary institutions for the care of the tubercular. The Government of this Province has led the way in Canada by providing a sanatorium at Kentville for the treatment of incipient cases, which in the past five years has sheltered over 300 patients.

The efficiency of this institution has been recently increased by the appointment of a resident medical superintendent, specially trained in the work. Twenty patients can be provided for, and modern hygienic and dietetic treatment is scientifically carried out. Tuberculin is administered in suitable cases. The cost of board is \$5 a week, which includes medical and other attendance. Only cases apparently curable are admitted, and the length of stay is limited to six months. Any further information will be gladly furnished by the resident physician.

It is to be hoped that the marked success it has achieved from both the curative and educative standpoints, and the proven necessity for its existence will induce the Government to provide further accommodation both there and in other localities, for numbers are continually on the waiting list and unable to take advantage of the treatment at the critical time when the disease is first detected.

Students of the subject agree on the need for at least three different classes of institutions for the tubercular. First, dispensaries or places at which consumptives could secure diagnosis, and reference to a hospital for either incipient or advanced cases. There is not the pressing necessity for this type in our part of the country as exists in larger cities, but there is a field for a bureau or Tuberculosis Aid Society at various central points, from which assistance could be supplied in the way of advice, instruction, attendance, and the furnishing of proper food and appliances to those who lack them.

Secondly, the sanatorium or hospital for the treatment of cases in the early stages. We have already referred to the existence of the Provincial Sanatorium, and to the need of the extension of our present bed accommodation in this line.

Thirdly, the hospital for the treatment of advanced cases. This is at present the weakest point in the defences against the enemy. It is particularly requisite for the handling of the poor or homeless or vicious consumptive. This class of consumptive is apt to be the most dangerous to the community. They have not the means, perhaps not the knowledge nor the inclination, to properly guard against disseminating the infection. They are apt to be moving from one place to another and always in poor surroundings, and amongst others of the same unfortunate social level as themselves. These must be provided for, segregated, even by force if necessary, although experience elsewhere proves that this will be seldom called for where institutions exist in which proper food, care and kindness are known to be found. The cost of such institutions need not be great.

In some instances, possibly they could be erected and managed as adjuncts to existing municipal poor-asylums. But in any case, we need them, and for charity's sake, if not for our own, we should give the poor suffering victim a place where, if he cannot live, he may at any rate die in peace.



FIG. 5.—St. John's Home for Chronically Tubercular Cases
 (model plan of 1914). Located on City Hospital Grounds, and under
 Hospital Authorities, Hamilton.

The number of persons who are victims in London alone upward of 10,000 persons — a great many of them are children — is not only a national loss, but a national calamity. Moreover, it is the only one of our national losses which is not being lessened. In the working class of London alone annually four or five million persons are born, and only a few million of us who are blest with health, to say nothing of our own, are able to care for the terrible suffering which our ill children in our midst are undergoing. It is our duty to do all that we can to end the days of their poverty.

CHAPTER XIX.

Building a Sanatorium—Some Suggestions in regard to Construction and Site.

By THOMAS SPEES CARRINGTON, M.D.

Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis, in charge of its Bureau of Construction, and a special expert on Hospital Construction in the New York State Department of Health.

WHEN a community wishes to build a sanatorium in which to house its tuberculous patients, the question at once assumes such a complicated aspect that unless someone interested has had large experience in planning and managing institutions, the promoters soon feel that the task before them is almost a hopeless one.

If a hospital is mentioned to those who have not considered the question, there seems to arise in their minds the phantom of a great substantial building, constructed on the lines of a barracks, and consuming funds, both during the building, and later in its maintenance. After this spectre has been dispelled, they become interested, their attitude of opposition usually disappears, and they are delighted to know that open-air buildings for the treatment of tuberculosis can be cheaply constructed and maintained. It would seem that one of the important duties resting upon the societies fighting tuberculosis, is to publish broadcast a statement making clear to the farmer as well as to the town and city dweller how easily, simply and cheaply these buildings can be constructed and why the cost of maintenance is low.

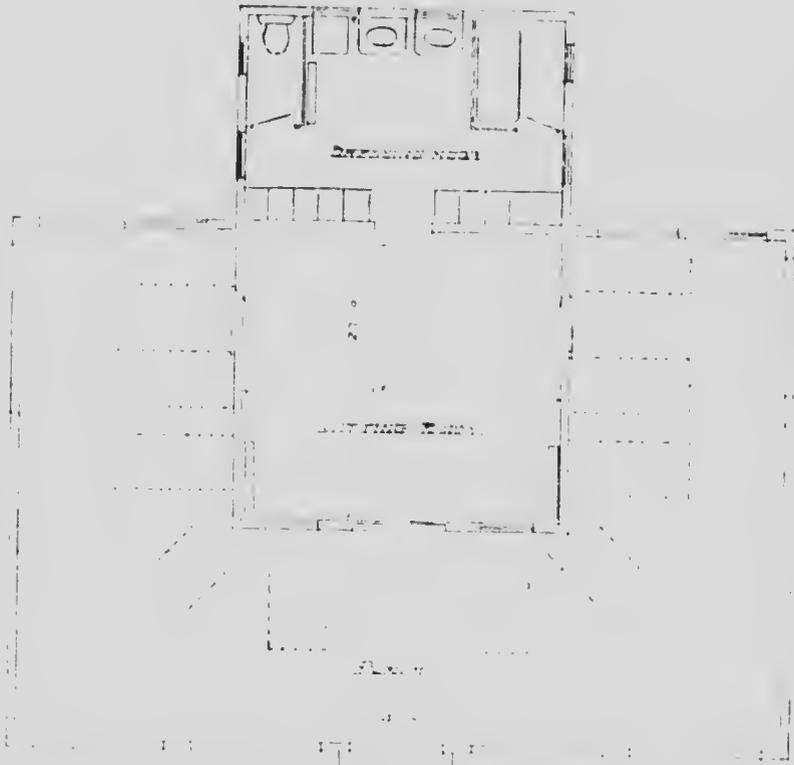
With such a problem, it is only by entertaining the simplest and most economical suggestion that one can hope, particularly in small communities, to carry through the project. Beautiful and elaborate institutions costing hundreds of thousands of dollars have been designed and built, but careful investigation shows that as good results in returning the patients to health can be shown by small institutions built along cheap, simple and economical lines. What is of equal importance is that the institution sends back its patients into the world and to the social status from which they came, without having unsettled their minds and made them discontented with the environment and life to which they belong. If we place patients from poor homes among surroundings which to them are luxurious, and keep them there from six months to two years, we are bound to create in them a mental state which unfits them for the life to which they must return. While luxuriously equipped sanatoria have discharged numbers of discontented individuals who have returned to poor and squalid domestic surroundings, excellent results have also been obtained in institutions providing only

the actual necessities of life, since sending the patient from a city home to an outdoor life in the country often is sufficient change to bring about a cure. Those who adhere rigidly to extreme simplicity and economy in sanatorium construction and furnishing and who supply patients with good wholesome food, cleanliness, light employment and a happy, friendly atmosphere, need not fear that they will ruin the citizen while curing the individual.

In selecting a site communities must decide whether the advantage of having the patients near at hand and accessible to their friends outweighs the slight advantage obtained by placing the institution in the mountains or other regions distant from the patients' homes. Within a short distance of almost every city and town of this country land can be obtained on which tuberculous patients will do well, but when large institutions are to be erected the question of a site must be considered with care. The climatic conditions should be investigated and are very important. This will include obtaining data with regard to the altitude, average humidity, number of stormy days in the year, highest and lowest degree of heat and cold, prevailing winds, and other natural conditions which may affect either the patients or building materials. It is well to remember that vastly differing climatic conditions are often found within a radius of a few miles, and the information in regard to these conditions should be gathered on the site itself. The southern exposure of a hill or mountain is usually to be preferred. Sites where strong prevailing winds exist during certain seasons of the year should be avoided. If heavy frosts are frequent during the winters, substantial buildings and heating plants will be necessary, and more



IOWA STATE SANATORIUM, COTTAGES. TYPE OF CHEAP COTTAGE FOR TUBERCULOSIS. H. E. FINE. ARCHITECT. COST \$1



IOWA STATE SANATORIUM COLLEGE, LEONARD P. ...

The Iowa Sanatorium College is one of the earliest buildings of the college and consists of a large sitting room, 17 by 25½ feet, about which is built a porch 17 by 25 feet (a dressing room, 17 by 9 feet, containing lockers and a set of scales). It was planned for ten patients, but is more comfortable when only four are used. Patients can reach the sitting room, as the porch does not extend beyond the main apartment. It is claimed that this structure will give the patients a better view of the country than a heavy storm, and patients will get sun from the porch by its windows, the way they do in "Some Plans and Suggestions for Housing Cases in the ..."

careful consideration given to the placing of baths, toilets, and sinks, so as to keep the water supply and drainage from freezing. Often the site selected will supply some of the building material. In many parts of the country timber is plentiful, and in these localities frame buildings will be the cheapest. Shacks have sometimes been erected in the humber regions with no expense except for the cost of labour. In many places sand for concrete, clay for adobe brick, and rock for stone buildings will be found on the property selected. The question of drainage will often be greatly simplified if the sanatorium can be erected on the side of a hill or mountain. Transportation facilities should always be considered, as a long haul from the railroad or landing adds expense both in building and maintenance.

A site on a direct trolley line is very desirable, so that it can easily be reached by the patients' friends. It is always found to hold consumptives in a sanatorium at first, as the very sick do not like to leave their families, and incipient patients become restless if they are not happy.

If the hospital is close to the city where visitors can reach it every day by a short trolley trip, the location will help very largely in making the patients contented. The site should be a tract of land, preferably one hundred acres in extent, including forest, orchard, and land that can be cultivated. It is now generally conceded that incipient patients improve faster when they are supplied with work, and under a wise, well-informed medical superintendent they will be able to do a large part of the farm work, with real benefit to themselves and large reduction in the cost of their maintenance. When there is choice of a number of sites, a damp or swampy location should carefully be avoided, as such land when used for a sanatorium must be drained often by a subsoil method, which is expensive. A good supply of water is a necessity, and it will be well, for this reason, if a farm can be secured within the line of the city water supply and sewer system. The question of water, sewage disposal, and lights will then be settled and great expense saved. When this is impossible there should be good springs, a running stream of clear water, or a thoroughly protected well on the site, and if these are not above the buildings a pumping plant will be necessary. The disposal of sewage from the institution must be considered before the land is acquired, as the quality of the soil, the rise of the land and the position of water-courses and lakes enter into the question and increase or reduce the cost of installation and maintenance. As the expense of preparing some land for a sanatorium site is very great, and on other property a large outlay for improvements is not necessary, it is advisable to have a thorough examination of desirable land made by a competent sanitary engineer.

A sloping or hilly piece of land will be more desirable than a level one. Meadows and trees add to the cheerfulness of the landscape, and a forest, preferably of pine, makes a good shelter. A great deal can be done by artificially improving the grounds where there is a lack of natural beauty, and in the selection of a site in bare country this should be planned for.

Often farm-houses or other buildings are found on the land selected, and can be remodelled so as to make useful administration buildings where economy is necessary. Old farm-houses have been remodelled by building wide verandas around them, which make fairly comfortable open-air quarters for small numbers of patients. This leaves the interior for administration purposes, and gives a small but complete sanatorium under one roof.

Old buildings must also be examined carefully and an estimate given of the cost of correcting insanitary conditions, special care being used to learn if the buildings are damp at any season of the year, and what is necessary to remedy the defect. The farm-house can be used as an administration building, and, if large enough, the kitchen, dining-room, amusement room, and offices may be arranged on the ground floor. The second floor will be needed for nurses' and servants' quarters, but it should be thoroughly clean and painted throughout, and toilet and baths added. The barns and outbuildings, if in good condition, save a large outlay. They can be used for cows and chickens, as domestic animals, farm and garden produce should be counted on to reduce the cost of maintenance.

After the site has been chosen and the building material decided upon, plans for a suitable administration building should be worked out first. A sanatorium or hospital, even when built for a small number of patients, must have some kind of a structure in which the details



LOOMIS SANATORIUM, CHAPMAN, COTTAGE. A REMODELED FARMHOUSE. THE BUILDING OF SLEEPING PORCHES, INSTALLING OF SUITABLE HEATING PLANT, TEARING-DOWN PARTITIONS AND CUTTING-DOWN DOORS COST \$1,200.

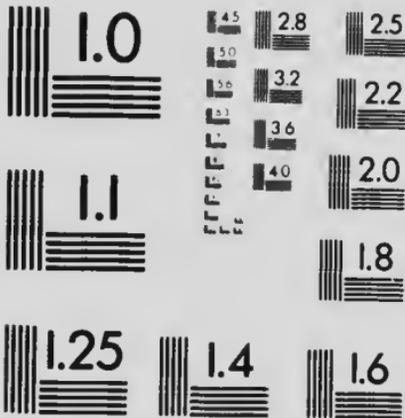
of its management can be carried on. The larger the institution the more complicated this question becomes; but practically all plants need doctors' and nurses' quarters, a laboratory, and an observation ward, kitchen, pantry, store rooms, dining room, baths, toilets, servants' quarters, and a laundry. In a sanatorium for the open-air treatment of tuberculosis these apartments are usually provided for in a separate building, and cottages or lean-tos built about it to complete the institution.

There are three ways of administering hospitals for tuberculous patients. The first is to provide a certain number of apartments for these purposes in the same building that houses the patients. The second method, and the one most in use at the present time, is an administration building with a number of lean-tos or cottages grouped about it. The third has only been used by large institutions occupying a wide acreage and housing more than 200 patients. A building is erected near the centre of the sanatorium grounds for office and general administration purposes. The patients' quarters are divided into units with a capacity of about 150 beds each, and are grouped about a small administration building, containing a kitchen, dining-room, sitting-room, and other apartments needed by the patients. A number of such units may be placed at different points on the sanatorium grounds, and connected by telephone with the general administration building and each other.



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In planning a sanatorium a good method to follow is to decide upon the number of rooms needed for administration purposes and the use they are to be put to. Then design the administration building to house them, and build good, substantial buildings on lines that can be enlarged if necessary. It is believed that it is much more important to have a substantial, solid and well-constructed administration building than to build expensive quarters for patients, especially if only incipient cases are to be admitted.

When a farm is selected without a house, it is advisable to put up a small, plain, but well-constructed administration building. This can be erected by using concrete tile for about \$16,000.

In the basement are placed the heating plant, a refrigerator, coal bunkers, and a room for the laundry. On the first floor are the doctor's and superintendent's offices, a large kitchen, a dining-room to seat 40 patients, and a sitting-room opening by folding doors into the hall and dining-room, so that the two rooms can be thrown together for amusement purposes. The second floor is divided into medium-sized rooms for the officers, nurses and servants, and most of the apartments open by doors on the large veranda, so that the upper story may be used as an infirmary or for nurses and servants who, if they have been cured of tuberculosis, will often wish to sleep in the open air.

There has been a great deal of discussion as to the best method of grouping patients' quarters about the administration building of a sanatorium for the open-air treatment of tuberculosis. Some authorities contend that all lean-tos and other buildings for housing patients should be connected by covered passage-ways or corridors; while others feel that patients do better where they are compelled to go through the open air when walking from one building to another, as the patient is there to get fresh air, and the more he gets the better.

A large amount of money has already been expended in building corridors. The superintendents of some institutions feel that the money put into corridors would have been much better expended if used in increasing the size or improving the buildings of the plant. In planning an institution, the architect and engineer should carefully consider the climatic conditions of the locality before advising the expenditure of comparatively large sums in covered passage-ways.

A much more important point, and one that has very often been overlooked, is the placing of lean-tos or other buildings for housing the patients in such a manner as to give a pleasant and interesting outlook to the patient, who may be housed in a certain building for many months, sometimes extending into years. The comfort, pleasure, and contentment of the patient should always be carefully considered, and the question of holding patients at a given institution is daily becoming more important. Shacks, lean-tos, and cottages, where patients are often confined for weeks at a time with practically nothing to do, have been placed facing the back of some other building, or behind an obstruction to the view, when with a little care and foresight they might have been placed overlooking beautiful valleys or other interesting scenes.

The question of building for advanced and incipient cases ought to be considered separately, when possible. Authorities agree that patients in the early stages of tuberculosis should live out of doors. This can be more

easily insisted upon when institutions are constructed in a manner to give plenty of comfortable open-air porch room, and only enough warmed space for the necessary dressing and toilet facilities.

The evolution of the lean-to or slack type of building to its present usefulness and numerous modified plans is due to faith in the open-air treatment.

In 1903, Dr. Herbert M. King of the Loomis Sanatorium needed more porch room for the open-air treatment of his patients. It occurred to him that an inexpensive open sleeping porch could be erected on the same plan as the old hunting lean-to which trappers and hunters build in a few hours and use for shelter in the backwoods. His first lean-to was planned



LOOMIS SANATORIUM, NEW YORK, ORIGINAL IMPROVED LEAN-TO.
DESIGNED BY DR. HERBERT MAXON KING. COST \$1,830.

to shelter eight beds. It was built by the sanatorium carpenter from rough lumber at the cost of a few hundred dollars, and it was so cheap and easily constructed that Dr. King designed a second with a few improvements which he soon put up. The patients in this building were comfortable and liked their new quarters so well that this became a permanent part of the sanatorium.

The improved lean-to is really two lean-tos, one or more rooms in the centre from which extend at opposite sides porches open at the front but protected in the rear and sides by walls, and covered with a suitable roof. The central rooms are heated by a stove, and in one are lockers for the patients, a bath and toilet facilities, while the other is well lighted, ventilated, and furnished with comfortable chairs as a sitting-room always accessible to the patients who sleep and live on the open porches.

A good, substantial lean-to housing 16 patients, and divided in the centre by toilet, locker and sitting-rooms, can be built for \$2,500. If two such structures are erected on one side of the administration building, one lean-to can be used for the women and one for the men. These buildings can be placed on brick piers without cellars, and the front of the

porches protected by canvas curtains. A heating plant is unnecessary, but the toilet, dressing and sitting-rooms should be heated by a stove. The open porches are usually left without ceiling or other finish. For these reasons the incipient patients' quarters can be built cheaply, and as the outside walls and roof are shingled and stained, they have an attractive appearance.

Consumptives bear excessive cold well, and therefore expensive sash and glass windows or doors inclosing open-air shacks are in many cases unnecessary. The objection made to cheap cottages and lean-tos is that they are not substantial permanent buildings, and although that may be true, a structure costing \$2,500 and giving ten years' service can be torn down and rebuilt on the same line a number of times for less money than it costs to erect a permanent structure which may become useless and out of date.

Good results are obtained in buildings having no plumbing or heating arrangements. The patients use the ordinary wash bowl and pitcher, or go to a small central building where the toilet, washing, and bathing facilities are concentrated.

Lean-tos should be built with plenty of porch space in front of the building to give room at the ends of the beds for patients to move about freely, and with a locker for each patient, large enough to be used as a private dressing-room.

Ventilation is a most important question to be considered. Even lean-tos with open fronts are often badly ventilated, and at times the air of the porches becomes full of foul odours if cross-circulation is not obtained.

The original lean-to type was intended for housing incipient cases, but since its general adoption, at some institutions it is used for advanced cases. The building is made comfortable for very sick patients by closing the front with glass windows or doors and heating the whole building by steam or some other method in cold or stormy weather.

Glass doors close in the porches during the cold weather, and as the porches then become wards, they must be finished in plaster or ceiled with close-fitting boards. Partitions between the beds are advisable, as they add to the patients' comfort and give privacy to those who are very sick. A steam or hot-water plant will be needed for the entire building, and the dressing and sitting-rooms, nurses' quarters, diet kitchen and equipment can be arranged in the centre apartment.

A lean-to constructed in this manner will cost about \$5,000 but it will have much the same exterior as that used for incipient cases, and so give uniformity to the institution.

The method of separate heating arrangements for the administration building and the advanced ward, with stoves for the dressing and sitting-rooms in the lean-tos for incipient cases, is much cheaper than a central power and heating plant such as large state institutions often build.

Two lean-tos for 32 incipient cases and one building for advanced cases housing 16 patients will make the capacity of the institution 48 beds, which is usually as large as it is advisable for an institution to start with.

In an institution where both advanced and incipient patients are to be received, the patients' quarters should be divided into two units and

built on opposite sides, and as far from the administration building as will admit of easy and economical management. A bad effect is produced upon incipient patients who are on the road to recovery by



LOOMIS SANATORIUM, ORIGINAL IMPROVED LEAN-TO. VIEW OF PORCH SHOWING SIMPLICITY AND CHEAPNESS OF CONSTRUCTION.

the death of patients in the advanced wards. Advanced cases are taken into the hospital in order to isolate them and reduce the danger of infection in the homes from which they come. Therefore it is to be expected that they will die in the hospital, and arrangements must be made for such events.

"Because your father or mother was killed in a railway wreck it does not necessarily follow that you will die in the same way. This is true if either or both parents died of consumption. Simply take proper care of yourself. Live, for instance, as consumptives are now taught to live. The methods of cure are also methods of prevention.

"The fight against consumption is never a fight against the consumptive. The first and most important step to be undertaken by any community in a warfare against the white plague is to provide ample hospital facilities for the cure of consumptives, especially advanced cases. This must be done first for the sake of the sufferer, and secondly for the protection of the community." - *Municipal Commission on Tuberculosis, St. Louis.*

CHAPTER XX.

A Difficulty and a Remedy.

(Contributed.)

ONE difficulty we have to contend with in Canada at the present time in carrying on anti-tuberculosis work, especially among people of slender means, is the very high prices that have to be paid for many of the appliances and nursing supplies needed either in the sanatorium or the home for the successful treatment of the disease. There is a crying need for a remedy for this state of affairs. Both the authorities who manage the hospitals, whether governments or charitable organizations, and the poor victim who needs to make every cent count for the most, are compelled to pay excessive prices for articles of this kind. The greater part of them are not made in Canada at all. They pass through so many hands from the time they leave the manufacturer until they reach the consumer that prices become in many instances exorbitant. A great part of the money paid for them goes out of the country altogether. The establishment of their manufacture here would, as far as we are aware, conflict with no interest now existing.

A remedy that suggests itself to the writer is the employment of inmates of our penal institutions in the manufacture of these supplies.

We have in the penitentiaries of Canada to-day about 1,800 male prisoners, a considerable proportion of whom are capable of being put to useful labour as artizans. To engage them in a task more useful than the one we refer to would, we believe, be difficult. A large number also of female convicts, perhaps 20 per cent. of them, are capable of acquiring a working knowledge of light, skilled labour. They, too, could be utilized.

The course suggested would, we feel, not only afford a class of employment suited to prisoners, being interesting and educative, but would be profitable to the country and would fill a great want in the department of public health. It would turn our penitentiaries in a way into philanthropic institutions. It would increase healthy public interest in their inmates as to their welfare, their reformation and their adaptation into useful citizens, if the product of their time were brought out in a form so useful and so welcome to the poor and the afflicted. These goods would, of course, be dealt out at cost prices to institutions or to such persons needing them as were certified by proper authorities. None would come into trade in the regular way for profit, or be exported from the country. We leave the amplification of the idea to public men and the proper officials. But we believe that there is here an opportunity for a useful and beneficent reform manifestly in the best interests of all concerned, and we strongly hope that we may before long see the first practical steps taken towards its accomplishment.

CHAPTER XXI.

Miscellaneous Reprints

From Press Service of the National Association for the Study and Prevention of Tuberculosis.

CHURCH'S CRUSADE AGAINST CONSUMPTION.

WITHIN the past four months the churches of over 100 different cities in the United States, all the principal religious denominations, and several interdenominational societies, have united in a campaign against consumption, according to a statement issued by the National Association for the Study and Prevention of Tuberculosis.

Notable campaigns have been conducted by the allied churches of New York, Brooklyn, Pittsburg, St. Paul, Milwaukee, Washington, Chicago, Providence, Baltimore, Trenton, Seattle, Philadelphia and many other cities. In most of these places a special Sunday has been set aside on which sermons about tuberculosis have been preached in the various churches. So successful has been this method of declaring the gospel of fresh air that it is being adopted by pastors all over the country.

In several of the larger religious denominations definite resolutions by some of the local ministerial organizations, allying these associations with the tuberculosis movement, have been adopted.

Foremost in the fight against consumption is the Catholic Church. In this church, under the direction of Archbishop Ryan, of Philadelphia, an educational crusade against tuberculosis is being carried into all of the parochial and other schools in its control. As a result, over 1,250,000 school children in 13,000 parishes are being reached. The clergy of the church have been asked also to instruct their congregations on the dangers and methods of preventing tuberculosis, for the purpose of bringing the simple doctrines of the cure and prevention of this disease to every one of the 17,000,000 Catholics in the United States.

The work of religious bodies in the war against tuberculosis received a great impetus in 1905, when Emanuel Church, of Boston, under the leadership of Dr. Joseph H. Pratt and Reverend Elwood C. Worcester, started a movement for the treatment of tuberculosis patients in their homes under the supervision of the church. As the patients held weekly meetings at the church for instruction and advice from the physicians in charge, the organization was called a class. So successful was the Emanuel class's first year's work that many other churches throughout the country have followed this example, and tuberculosis classes have been formed in a large number of cities, in many cases independently of church organizations. There are now about fifty regular classes in existence, over one-half of which are conducted in connection with churches.

TWENTY THOUSAND CHURCHES ENGAGED.

The activity of the Church, however, as a centre of education in tuberculosis, is of much more recent growth. In fact, almost all of the preventive educational work of the churches has been accomplished in the last four months. The National Association for the Study and Prevention of Tuberculosis estimates that there are now over 20,000 church congregations to whom the message of the prevention and cure of tuberculosis has been preached, and the number is increasing daily.

CAMPAIGN UNDENOMINATIONAL.

The religious campaign is not only undenominational, but it is also interdenominational. The Young Men's Christian Association, for instance, has started an active crusade against tuberculosis. Through its physical department instruction is being given concerning the nature and dangers of consumption to all of the men and boys who come under that branch of the association. Educational lectures are also being held in many of the associations, and, in general, the campaign against tuberculosis is being linked with the general crusade for a sound body and a sound mind.

The United Society of Christian Endeavour has also taken an active interest in the tuberculosis propaganda. At the International Convention of that body, to be held in St. Paul from July 7th to 12th, one of the large tuberculosis exhibits of the National Association for the Study and Prevention of Tuberculosis will be on display. An active campaign of education will be carried on among the 10,000 delegates, who will act as missionaries in further spreading the message. The tuberculosis exhibit will be shown by the side of missionary and other social and civic exhibits.

This campaign among the churches and religious organizations is only a special instance of the widespread interest in tuberculosis, which has enlisted within the last year the efforts of such organizations as schools, labour unions, women's clubs, commercial institutions, state legislatures, the press, and almost all of the organized civic and social societies. By all of these organizations one sermon is being preached, namely, that consumption is a communicable disease, that it can be prevented, and that it can be cured by fresh air, rest and wholesome food.

CAN CONSUMPTION BE CURED ?

National Association Warns Against Use of Quack Remedies.

In view of the constant agitation and misrepresentation with regard to the treatment of consumption, the National Association for the Study and Prevention of Tuberculosis has issued a statement in which it states that the only sure cure for this disease is fresh air, rest, and wholesome food.

Hardly a week passes without some quack "doctor" or "eminent specialist," informing the public that he has at last discovered the sure cure for tuberculosis. After examining every one of these so-called cures, several hundred in number, the National Association states that, one and all, they are misrepresentations or fakes.

TWO CLASSES OF "CURES."

These so-called "cures" are divided into two general classes. The first class of "cures" includes the quack remedies and nostrums with which the public is being constantly deceived. These range in kind from "good whiskey" to pig's blood or ultra-violet rays. Some few of them, for instance, are cod-liver oil, lime dust, malt extract, goat's meat, corn-oil, clabbered milk, vegetable teas, and numerous inhalations of supposed germicides, besides a large number of well-known patent and proprietary medicines and numerous disinfectants. None of these are cures for consumption. They are rather for the most part of a dangerous character, and patients who take them may be running a serious risk. Consumption is caused by a germ which destroys portions of the lungs or other affected tissues. No drugs, medicines, inhaled gas, or home-made remedies can, by any means, kill the germ or close up the cavity in the lungs, as is so often claimed for these specifics. Neither is it possible to inhale a sufficiently strong germicide to kill the consumption germ. Such an inhalation would kill the patient before it would kill the germ.

Another class of "cures" for consumption, by which many people are deceived, includes the secret remedies advertised by unscrupulous "doctors" and "professors" at the heads of so-called "institutes." These people advertise that they can cure consumption at home by means of remedies which are secret and known only to them, or sometimes they advertise that they can cure consumption at the "institutes" through some secret course of treatment. For instance a "professor" out in Kansas conducts an "institute" where he claims he has a drug which will surely cure consumption. A "doctor" in Minnesota says he has a new remedy which he himself will exploit for the benefit of humanity. A Colorado specialist has advertised a new method of curing the disease. A St. Louis druggist claims to have found how to "dynamite" tuberculosis germs. An "institute" in a western state has been opened recently, which pretends to cure consumption, without resort to fresh-air treatment, largely by means of massage, osteopathic manipulations and some secret methods. Again, the National Association asserts that the very fact of secrecy in these cases tends to discredit the so-called cure. No responsible physician will find a cure for disease and refuse to make it known because of pecuniary motives.

CURE POSSIBLE.

The two classes of "cures" are not "cures" at all. Consumption is a curable disease, however, and in some places more than 75 per cent. of the patients under treatment have been restored to health. The essentials for the cure of consumption are rest, fresh air and wholesome food. A large number of physicians have been working for years to perfect a vaccine, or anti-toxin for tuberculosis, or to find some agent, such as tuberculin, which will assist in the cure of the disease. Thus far, the experiments have not furnished a product which will either absolutely cure or prevent consumption, or render the patient immune against the disease. Many of these serums have proved effective in increasing the resistance of the patient and

thus helping in the cure, but no scientist of repute to-day claims to have discovered a tuberculin which will produce a cure without the combined aid of fresh air, rest and wholesome food.

BENEFITS OF A TUBERCULOSIS SANATORIUM—PROPERTY INCREASED IN VALUE, AND HEALTH CONDITIONS BETTERED BY IT.

On account of the present agitation concerning the possible danger and detriment of locating a tuberculosis sanatorium or camp near an inhabited dwelling or valuable property, the National Association for the Study and Prevention of Tuberculosis issues a statement, which shows that in the great majority of cases such an institution has a beneficial effect, not only upon the sale of property, but also upon the health of the community.

In a recent investigation conducted by the National Association, 37 institutions located in 22 different States in all parts of the country were considered. According to information received from sanatorium superintendents, real estate dealers, and various disinterested parties, 67.5 per cent. of these tuberculosis sanatoria have had a favourable influence upon surrounding property, and have been a benefit to the community in which they were located.

In the case of 23, or 62.2 per cent. of the institutions, the presence of the sanatorium helped to increase the assessed valuation of surrounding property. In only one instance has property decreased in value, and there it was due to the ignorance of the facts. In 22 out of the 37 cases, the presence of a sanatorium has even been helpful in the recent sale of land, and in only four places has any detrimental effect on sales been shown. In 51.3 per cent. of the cases, residents have been attracted to the community by the sanatorium, and in only three localities have residents been repelled.

Some examples show the increase in the value of surrounding property. In the vicinity of a sanatorium in Portland, Oregon, land has more than doubled in value in three years, and is in demand close to the sanatorium. At Aiken, S.C., property in the neighbourhood of the local sanatorium has increased 400 per cent. since the institution was built. At Hebron, Maine, surrounding property has increased 20 per cent. as a direct result of the presence of a tuberculosis sanatorium. A similar effect upon land values has taken place in other towns, such as Lucerne, Pa.; Liberty, N.Y.; Saranac Lake, N.Y.; Pittsford, Vt.; Mt. Vernon, Mo.; and Silver City, N.M. At Asheville, N.C., vacant lots near one of the sanatoria in that city, sell at four times their price in 1900, and those farther from the institution but nearer the city are less valuable. Not a single instance was reported where the presence of a tuberculosis sanatorium, camp, or dispensary in a large city has had a detrimental effect on the value of surrounding property.

The Courts of Massachusetts, North Carolina and Virginia have decided that a tuberculosis sanatorium is not a menace to the health of a community, and that it does not decrease the value of land in its immediate neighbourhood.

The presence of a tuberculosis sanatorium has been a benefit also to

the farmers in its vicinity from the fact that it affords a market for their produce, and gives more work to the unemployed. The merchants, too, have testified that the sanatorium is a stimulus and help to trade.

The tuberculosis sanatorium has been of value to the community in the raising of health standards. In almost every city or town where such an institution has been opened, public spitting has decreased, more windows have been opened, and greater cleanliness in life has resulted.

For these reasons, the National Association for the Study and Prevention of Tuberculosis declares that instead of being a menace, a tuberculosis sanatorium may be regarded as a benefit to any community in which it is located, whether city or country.

DIRECTIONS FOR SWEEPING AND DUSTING.

Issued by the New York City Department of Health.

In sweeping a room raise as little dust as possible, because dust, when breathed in, irritates the nose and throat and often sets up catarrh. Some of the dust breathed reaches the lungs, making portions of them black and hard and useless.

If the dust breathed contains the germs of consumption—tubercle bacilli—which come from consumptives spitting on the floors, the risk is run of getting consumption. If consumptives use proper spit cups and are careful when coughing or sneezing to hold a handkerchief over the nose and mouth so as not to scatter spittle about in the air, the risk to others of getting the disease by living in the same rooms with the consumptives is inconsiderable.

To prevent making a great dust in sweeping bare floors, use moist sawdust. When the room is carpeted, moisten a newspaper, tear it into small scraps and scatter these over the carpet. In sweeping, brush these scraps of paper along with the broom and they will catch most of the dust and hold it fast, just as the sawdust does on bare floors. Do not have either the paper or the sawdust dripping wet, only moist.

In dusting a room, do not use a leather duster, because this does not remove the dust from the room, but only brushes it into the air.

Use soft, dry cloths to dust with, and shake them frequently out of the window; or use slightly moistened cloths and rinse them out in water when finished. In this way the dust can be gotten out of the room.

In rooms which have bare floors—in houses, stores, shops, school-rooms, &c.—all dust can be easily removed after it has settled, by passing over the floor a mop, which has been wrung out so as to be only moist, not dripping wet.

THOMAS DARLINGTON, M.D.,

President, Board of Health.

HERMANN M. BIGGS, M.D.,
Medical Officer.

"It is true that the rich and those in comfortable circumstances have it in their power to escape the disease, if they have the wit to do so. But how about the poor— they who, like dumb cattle, are driven by their necessities into the very face of death? Consumption claims most of its victims from that class and they have neither the power nor the knowledge to escape its clutches. Does not the Government owe them a duty? If consumption is contagious, it can be exterminated, or, at least, its ravages much curtailed; it consequently behoves every government to take up some other position in the matter than one of passive neutrality."—*Fitch*.



PORTLAND OPEN-AIR SANATORIUM COTTAGE. COST, \$1,000.



By Courtesy of Dr. J. S. Carrington.]

THE SANATORIUM COTTAGE. SHOWING FINISH AND CLOSETS AT END.

THE COTTAGES AT THE OPEN-AIR SANATORIUM, Portland, Oregon, are very attractive and convenient. They are built for one patient, and can be used at a private sanatorium where charges are high. The open-air room is 13 by 16 feet, with a bathroom 7 by 8 feet, and two closets, 3 by 4 feet, at the rear. There is a little hall from the main room which divides the bathroom from the closets, and the interior is very nicely finished in hard wood. The exterior is covered with stained shingles and trimmed with white. A number of these cottages have been built, and should be classed with the more substantial type of open-air buildings. They are all raised on piers, bringing the floor 2 feet 6 inches above the ground. This air-space prevents dampness and is enclosed with lattice work. The ceiling is of selected narrow boards, and also has an air-space between it and the roof, which is a very necessary precaution, and should always be made when constructing cottages in countries where the sun's direct rays are very hot during the middle of the day. — Extract from "Some Plans and Suggestions for Housing Consumptives."

CHAPTER XXII.

Reprints from Various Sources.

REPRINTED FROM "*The Journal of the Outdoor Life.*"

The Daily Round—The Patient's Viewpoint one of Optimism and Cheerfulness.

By A PATIENT AT STARMONT SANATORIUM, WASHINGTON GROVE, Md.

THE problem to be faced by a person who has tuberculosis and who proposes making a fight for his life is grave indeed. The price he must pay will in most cases revolutionize his life and send him back to first principles. If he is wise he will seek a sanatorium, of which there are many all over the country, because taking the cure at home, while it can be done, is infinitely more difficult, and in the long run can only be a compromise.

The underlying principle for the treatment of this dread disease is to give nature the best possible chance of throwing it off herself. We are born to live, and probably would if our ancestors and ourselves had better understood and obeyed her laws.

One of the fruits of civilization in its flower is tuberculosis. It was unknown to primitive man. Therefore the consumptive must get "back to nature" in as far as he can. He must leave the steam-heated house, get over his dread of night air and draughts, his appetite for rich and indigestible foods, for midnight lunches and irregular meals—must abandon all the excitements and allurements of social life and become once more a primitive man.

He must live a quiet, regular life in the open. Twenty-four hours of the day to be spent out of doors is the ideal. He must eat nourishing, simple food, and all of it that he can assimilate, and he must rest, rest, and again rest. No excitement his very recreation must be of the quietest.

Happy is he who has simple tastes, who loves the flavour of the soil and can glean healthful pleasure from the changes of the seasons, the habits of the birds and insects, the secrets of nature—in short who can be content in watching the wonderful changes in the sky by day and by night. Away from the busy marts of men, away from its turmoil and artificialities, one has time to meditate upon and enjoy the real things of life and grow in spirit as he could not possibly do under the pressure of modern affairs.

Sanatoria for tuberculosis are almost invariably situated in the country, sufficiently distant from a city to insure pure air and near enough for

convenience to a railroad station. An elevation and fine woods are preferable.

The old belief that in climate lay the secret of returning health is now generally considered a fallacy—treatment being the thing. It has been demonstrated that a person has almost as much chance of getting well near home under proper treatment as if he went to the erstwhile meccas.

A patient entering such a sanatorium finds himself in a new world. Usually there is a central or administration building surrounded by tents or cottages, or both, in which the patients live and sleep, taking their meals in the main building. Usually there is a hospital or infirmary where bed patients are segregated. Excepting these last he finds himself in the midst of as healthy a community of people as he will meet anywhere, and this perhaps is the first thing that strikes him. After a few months of this simple outdoor life patients take on flesh and gain a healthy rosy complexion that is the envy of their city friends. The atmosphere is distinctly cheerful. Everywhere, lying in reclining chairs, on the porches, or in the doorways of the tents, are these rosy folk, some busy with sewing or reading, others chatting cheerfully. If it is winter they seem entirely oblivious of the cold, but sit wrapped up in their rugs and fur coats with hot bricks at their feet and hot bottles in their laps, entirely comfortable, with snow or rain or what not a foot or two away. It is amazing how comfortable a tent can be at any season. In the winter the rear flaps are sealed, but except for privacy in dressing, the front ones are open at all times, day and night, so that the patient is practically out of doors, except for the protection the canvas walls give him from winds and storms on the three sides and overhead. Even so, one soon comes to enjoy and later to demand this maximum of fresh air, and a house is never the comfortable thing it once was, at least not as once used.

Time does not drag to the wise patient who finds diversion in everything at his doorstep. The regular routine life in itself makes a day pass quickly. Rising rather late and retiring early cuts off a day at both ends. At 11 o'clock a lunch of milk and eggs is served, and before dinner (the midday meal) a rest is indulged in, making the morning very short. Another rest of an hour after dinner and after that a walk or visits with one's neighbours fills in an afternoon. After supper many engage in music or games until the early hour for retiring, and the day has gone.

Many patients are able to work in a quiet way. Men sometimes do bench work, and the women, of course, find plenty of diversion in plain and fancy needlework. Both read and study, and in the summer many that care to may do a little gardening. So the months slip by and health is regained and the patient is able to take up his life again—slowly at first, but, if he is wise, more surely, as time goes on.

It is held that cheerfulness and hopefulness are characteristic of this particular malady. As a matter of fact the effect it has upon an individual is a matter of temperament. Troubles of all kinds affect a man according to his nature. Some it mellow and enlarges, others it hardens and sours. So it is with tuberculosis. As the average case, except in the last stages, suffers comparatively little pain, the chief trial is in his exile and the steady demand made upon his courage

and patience. Therefore the worrying individual continues to worry, while the hopeful one develops unthought-of capacities for fortitude, perseverance and patience that are almost pathetic in their heroism.

The tendency, one would judge, would be towards our common humanity. Social distinctions seem petty indeed where all are facing a common enemy in a common fight for life.

All honour to those brave soldiers, to those who lose as well as to those who win, for as Browning puts it—

"Success is nought,
Endeavour's all."

Some of our bravest spirits have sent forth to the world their messages while fighting this foe, and none has given more hope, perhaps, than "Robert Louis the Beloved."

THE REWARDS OF SITTING OUT.

The rewards of sitting out are numerous. The greatest of all is the solid satisfaction one takes in improved health. There is nothing like the joy of witnessing daily the slow but certain benefit—of watching the fever lessening down to normal, of watching the weight coming up to standard, of finding a new taste for food, or forgetting to cough, of having your friends exclaim upon your splendid appearance. And to know that one is doing the best and wisest thing, and doing it *right*, is in itself a sufficient compensation for all the trials of sitting out. You learn to pride yourself upon the military precision with which you carry out the orders of your commanding officer—that is to say, your doctor. You make it a profession, this carrying out of orders, and you come in time to plume yourself upon your professional standing. And then you console yourself by remembering it is not for always that you must lead this life of enforced idleness; soon the time will come when you may walk and drive, and stray into the woods after birds, and soon after that you will be allowed to take up some part of your burden of the world's work.

Meanwhile you will remember that you cannot have your loaf and eat it, and you cannot work and rest at the same time. A little breathing time has come to you—time to sit down and think, to broaden your views of life, and to get a nearer and perhaps a kindlier view of humanity. Perhaps your soul had of long habit cried out against the daily grind, and you had longed for a little leisure, and books and friends, and green stillness. Well here is the time and leisure, and all, and it has the additional charm now of being forced on you. Do not be so great a fool as not to take a brave joy of it!

I knew a man who told me in all earnestness that the year he devoted to "chasing the cure" was the most satisfactory and enjoyable year of his mature life.

Here is a letter of his, telling of how he took the cure in a bed, and what he made of the beauty of winter:—

THE BEAUTY OF WINTER.

"I like my old reclining chair, and am grateful to it for many profitable hours of ease. But for chasing the cure in winter give me a good *bed* every time! None of your cot affairs, with sagging springs, and covers on the

floor, and feet sticking out, for me! Give me a high-born *bed* sufficiently wide, with a tall head, and a level elastic mattress, and silent springs, and room to roll over!

"I have put a back-cushion of a Morris chair against the head, and a bunch of pillows. A cotton comfort and a blanket are under me, upon the mattress, and several woollen blankets and a wool comfortable over me. I lie flat, or I partly sit up, according to my humour. I wear medium underwear and flannel shirt, a suit of loose clothing, a sweater and a short warm overcoat. I wear loose warm shoes, which I kick off in bed, so they are kept warm. I wear loose wool gloves, and on my head I wear a monk's hood made of eider-down, made of a piece of goods the size of a newspaper, folded once, and sewed across the top. This is gathered under the chin with a safety pin—simplicity itself!

"By exchanging this for a fur cap (a size too large), and drawing on my shoes I am ready for my walk or drive.

"At the end of the porch I have a curtain of blue-and-white awning canvas, and part of the way across in front a low curtain of the same material, above the railing, strung on rings between wires. I push this aside when the wind is not direct. Outside, I have a fifteen foot awning, to keep out the rain and the glare, but this is usually pulled up.

"On a shelf by the bed I have the things I need, and my books—mostly essays and history, for I get too much absorbed in novels, and over-do the thing.

"Most of the time I lie relaxed and easy, companioned by the troop of subtle changes in the wintry landscape and—my hot-water bottle.

"A hot-water bottle is, to a bed, what a blazing open fire is to a room, giving company and warmth and cheer. Well wrapped in flannel, it keeps the inside of my bed an equable temperature, and all day I breathe the keen sweet air and consider the grey hills, pleased with the fortunes of the moment.

"All day the changes are making in the hollows and ridges and the rushing river down below—exquisite tones of purple and grey and brown, with the cold blue mountains sleeping across the west. Sometimes the sun breaks through, travelling over the hills like a lime-light, now making white and bold some bleak ridge or some cabin in a cove with a sycamore by the door, now leaving them in purple obscurity under the bending gloom of the skies. Sometimes all night it snows and the wind blows cold and hard, with the moon in a mist, and the morning comes bitter and bleak, with the fine snow driven into the wrinkled oaks.

"Sometimes the rain marches down the river and makes the land so sullen and stern and wild that the heart finds a challenge and a thrill in the very excess of gloom.

"And sometimes there comes a winter day when the season forgets its sterner vocation and lies down to sleep in the sun, and there is a brooding sense of eternity itself in the fleeting and beautiful afternoon.

"And at all times the winter is austere exquisite—more exquisite than the gaudy summer, or the poetry in books—so exquisite that the highest praise of anything fair might be to say, 'It is beautiful—it is as beautiful as winter.'

HOW TRANSPORTATION COMPANIES, EMPLOYERS OF LABOUR, PROPRIETORS OF HOTELS, FACTORIES, Etc., MAY ASSIST IN THE PREVENTION OF TUBERCULOSIS.

Issued jointly by The Board of Health of the City of Montreal and The Montreal League for the Prevention of Tuberculosis.

Tuberculosis, or as it is more commonly known, Consumption, is without doubt the most prevalent of all diseases. There is no town or village where it does not exist, in some form or other, no factory where it does not claim some victims; all hotels, in towns or elsewhere, receive tuberculous persons; and every day the railway and steamer companies transport them from one end of the country to another.

This fact must be emphasized: it is not the bed-ridden tuberculosis patient, he who is at the point of death, who is the most dangerous. On the contrary, the sufferer who is most to be feared is the one who has still strength enough to work in the midst of his companions in factory or offices; it is he who can still travel by rail or by steamer and sojourn in hotels in the country or elsewhere. These are the true sowers of bad seed, the distributors of germs, the "commercial travellers" of tuberculosis.

Everyone knows to-day that tuberculosis is transmitted by means of the expectorated matter which is the true vehicle of the tubercle bacillus.

If this bacillus attacks most readily the poor, the over-worked, the weak; if it counts a larger number of victims among those who ignore the rules of modern hygiene, or who live in the populous and infected districts of our large towns, it also strikes the strongest and best nourished, provided that they are exposed long enough to breathe in the germs of the disease by contact with the tuberculous.

We have only to concern ourselves here with the precautions to be taken in railway carriages, steamers, factories, and hotels, in order that the tuberculous patient may cease to become a source of danger to those about him.

The cuspidor is one of the most powerful means that we possess to protect ourselves from the diffusion of the tubercle bacillus. *Hygienic cuspidors* should be placed in railway carriages, on steamers, in the rooms of hotels, in a word wherever people congregate. Spitting elsewhere than into a cuspidor should be prohibited.

In spite of all this, however, there will always be some careless and obstinate patients who persist in spitting upon the floors, and we must protect ourselves against these people by prohibiting dry sweeping, that raises clouds of dust from the floors and carpets, etc., which almost always contain tubercle bacilli from the dried sputum.

It is also on account of these recalcitrant invalids that from time to time disinfection must be insisted upon of railway carriages, steamers,



Sanitary Wall Spittoon.

and the rooms of hotels. This disinfection can now be carried out rapidly and at small cost.

We make an urgent appeal to transportation companies, to proprietors of hotels and of factories to hang on the walls of their railway carriages, steamers, working rooms and offices, wallcards, setting forth the dangers of promiscuous spitting.

The Anti-tuberculosis League will be glad to furnish all necessary information concerning disinfection and sanitary cuspidors. It will also supply literature on the subject of tuberculosis to all those who will apply.

MUNICIPAL COMMISSION ON TUBERCULOSIS, ST. LOUIS.

SPITTOONS SHOULD BE PROVIDED AND THEIR USE COMPELLED.

In factories, workshops, big stores, etc., there should always be a sufficient number of spittoons, preferably elevated and of unbreakable material. Wherever such precautions are taken and some conspicuous signs, forbidding expectorating on the floor, put up, and if necessary making it punishable by discharge, promiscuous spitting will soon cease, and an important point in the combat of tuberculosis will be gained.

All employes, men and women of whatever class, should be allowed ample and regular time for their meals, which should never be taken in the workshop. Special rooms should be kept for that purpose. Opportunity should be given to the workers to rest or walk in the open air for a little while after their meal. It is also of importance for the health of the labourer to wash his hands thoroughly before touching food, and proper conveniences should be provided for that purposes. Factories, workshops, large stores, etc., should, of course, be well ventilated, but it is particularly necessary that they should be thoroughly aired after working hours. These precautions apply not only to large establishments, but to the smallest concern with one or two employes as well, and every employer should bear in mind that a healthy labourer is of greater value than one who is overworked, underfed, or badly housed. Lastly, employes should not be overworked. There should be reasonable hours for all, so that the labourer may enjoy the bodily and mental rest which is essential to the preservation of health. The germs of any disease, but particularly those of tuberculosis, will always find a more congenial soil for development in an overworked and enfeebled system. Child-labour, that is to say, the employment of children under fourteen years of age, in factories, workshops, mines, etc., should be prohibited by law. The child is more susceptible to tuberculosis than the adult, especially when its delicate growing organism is subject to continued physical strain.

FACTORY INSPECTION.

In many States of the Union there now exist laws whereby the sanitary conditions of factories, workshops, department stores, etc., are assured. Of course, there is room for much improvement in this respect, especially in regard to light and sufficient ventilation in factories where

dust and gases are a constant menace to the labourer. Wherever practicable, respiratory masks for protection against particularly irritating dust should be worn.

WHAT EMPLOYEES SHOULD DO.

In all these matters the labourer can help himself a good deal by his own efforts to make a seemingly dangerous occupation more safe. During the hours of recess, and before he goes to work, as well as afterwards, he should always strive to be as much as possible in the open air, drink plenty of pure, clean water, keep early hours, live as regular a life as possible.

NO DANGER OF TUBERCULOSIS TO THOSE WHO DEVELOP CHEST AND LUNGS.—By Dr. S. A. KNOPF.

As soon as the intelligence of the growing child will permit, it should be taught to breathe deeply, and later on be taught to take the following breathing exercises, which the child should learn to love as the average boy or girl loves general gymnastics:—In front of the open window or out of doors assume the position of the military "attention," heels together, body erect, and hands on the sides. With the mouth closed to take a deep inspiration (that is, breathe in all the air possible), and while doing so raise the arms to a horizontal position, remain thus holding the air inhaled for about three seconds, and while exhaling (breathing out) bring the arms down to the original position. This act of exhalation, or expiration, should be a little more rapid than the act of inspiration. When the first exercise is thoroughly mastered and has been practised for several days, one may begin with the second exercise, which is like the first, except that the upward movement of the arms is continued until the hands meet over the head.

Take the same military position of "attention," and then stretch the arms out as in the act of swimming, the backs of the hands touching each other. During the inspiration move the arms outward until they finally meet behind the back. Remain in this position a few seconds, retain the air, and during exhalation bring the arms forward again. This somewhat difficult exercise can be facilitated and be made more effective by rising on the toes during the act of inhalation, and descending during the act of expiration.

OUT OF DOORS EXERCISES.

Of course, when out of doors one cannot always take these exercises with the movement of the arms without attracting attention; under such conditions raise the shoulders, making a rotary backward movement during the act of inhaling; remain in this position holding the breath for a few seconds, and then exhale while moving the shoulders forward and downward, assuming again the normal position. This exercise can be easily taken while walking, sitting, or riding in the open air.

TO CORRECT STOOPING.

Young girls and boys, and especially those who are predisposed to consumption, often acquire a habit of stooping. To overcome this the following exercise is to be recommended. The child makes his best effort to stand straight, places his hands on his hips with the thumbs in front, and then bends slowly backward as far as he can during the act of inhaling. He remains in this position for a few seconds, while holding the breath, and then rises again somewhat more rapidly during the act of exhalation.

The following general rule concerning breathing exercises should always be remembered:—Commence with the easier exercises and do not begin with the more difficult ones until the former are completely mastered. Take from three to six respiratory exercises, either of one kind or the other, every half hour, and continue this practice until deep breathing has become a natural habit. These exercises should always be taken in an atmosphere as fresh and as free from dust as possible. Never take these exercises when tired, and never continue so long as to become tired.

Among exercises which have a tendency to develop and strengthen lungs and throat, should be mentioned singing and reciting in the open air.

ALCOHOL AS A PREDISPOSING CAUSE OF CONSUMPTION.

EXTRACT FROM "*The Co-operative News*."

If there is one thing more certain than the connection between consumption and bad air, it is the connection between it and alcoholic drink.

Whether it be true that poverty is the cause of drunkenness, or drunkenness the cause of poverty, or that both of these statements are true, in different degrees, it is provedly true that drink is one of the predisposing causes of consumption.

This statement is not the expression of teetotal fanaticism, glad of the opportunity of "getting a rip" at alcohol. On the contrary, it is the statement of a fact regarding which there is now no gainsaying; and "facts," as the Scots have it, "are chiels that winna ding."

Alcohol fosters the spread of consumption in two ways: (1) by its own special action upon the human body, and (2) by its association with the public-house.

Alcohol and the Human Body.—At one time alcohol was believed to be antagonistic to consumption, and to tuberculosis generally. But we now know that this is the very reverse of the truth; that instead of protecting the body it actually predisposes it to the attack of the tubercle bacillus.

Its action is that of a depressant of vital energy, with consequent reduction in the normal disease-resistance power of the body, which is thus more vulnerable to disease when under its influence. There is no

more easy prey to any serious illness, such as typhoid fever or pneumonia, or to any severe accident than the drinker, who will often die when the abstainer will recover from a similar attack; and every hospital surgeon knows the extra risk there is in giving chloroform to an "alcoholic." "The one patient of all others," said Sir Frederick Treves, "that I dreaded to see enter an operating theatre was the drunkard."

The consensus of opinion upon the question of the alcoholic habit specially predisposing to consumption is considerable, and the highest authorities agree that it is one of the most potent factors in the propagation of the disease; not because it begets it, but because it impairs the tissues, making them more suitable soil for the rooting and growth of the bacilli. In fact, there is one variety of consumption of the lungs known to medical men as "alcoholic phthisis"; but, short of this, alcoholism is undoubtedly one of the most prolific predisposing factors in the starting of tuberculosis.

"So far from being antagonistic to tubercular disease, as was at one time supposed," says Professor Sims Woodhead, "alcohol is looked upon as one of the great predisposing factors in its production"; and Professor Broudel, at the Congress of Tuberculosis, said that "alcoholism is the most potent factor in the propagation of tuberculosis."

Alcohol and Drinking Water.—Before leaving this subject, we may allude to the popular fallacy that alcohol kills the disease germs in drinking water; an idea which is a frequent excuse for taking spirits, especially when the water supply is not above suspicion; and the writer has met people abroad who boasted that they never drank water by itself because it was dangerous. The truth is that the alcohol does not destroy the disease germs, and the drinker is thus taking both these and the alcohol.

INSPECTION OF MILK AND MEAT.

The systematic inspection of milk and meat and of cows and public dairies is one of the measures which early received the attention of the Association.

The more thoroughly the relation between tuberculosis in infants and tuberculosis in dairy herds is investigated, the more serious the problem is seen to be.

The general trend of opinion is in the direction of requiring that all food supplies, especially the products of the herd or the dairy, be held under the firm control of authority, whether of the General, the Provincial, or the Municipal Government.

Dr. George F. McCleary, Medical Officer of Health, Metropolitan Borough of Hampstead, sums up the conclusions of the Royal Commission in this wise, "The following propositions have been demonstrated:—

"1. In a certain number of cases, the tuberculosis occurring in the human subject, especially in children, is the direct result of the introduction into the human body of the bacillus of bovine tuberculosis.

"2. That a very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cows' milk containing tubercle bacillus.

"3. That the milk coming from a tuberculous cow ought not to form part of human food, and, indeed, ought not to be used as food at all.

"The practical conclusion of the Commission is, that their results clearly point to the necessity of measures more stringent than those at present enforced being taken to prevent the sale or consumption of such milk."

In a paper published in the *British Medical Journal*, December 21st, 1907, Dr. John McCaw, President of the Ulster Medical Society, gives the following figures to illustrate that prevalence of tuberculosis among children in the United Kingdom:—

1906—Belfast Hospital for Sick	(No. of intern patients, 827.
Children	- - - - - / .. tuberculous, 20·10 per cent.
1906—Ulster Hospital for Sick	(.. of intern patients, 247.
Children	- - - - - / .. tuberculous, 30·36 per cent.
1905—Great Ormond Street,	(.. of intern patients, 2,876.
London	- - - - - / .. tuberculous, 27 per cent.
1906—Royal Edinburgh Hospital	(.. of intern patients, 1,968.
	/ .. tuberculous, 20 per cent.
1905—Manchester Children's	(.. of intern patients, 1,999.
Hospital	- - - - - / .. tuberculous, 21·3 per cent.
1905—East London Children's	(.. of intern patients, 2,954.
Hospital	- - - - - / .. tuberculous, 24·3 per cent.
1906—Glasgow Children's Hos-	(.. of intern patients, 1,777.
pital	- - - - - / .. tuberculous, 27·95 per cent.

After discussing the types of tuberculosis found among children, Dr. McCaw asks, "What connection exists between tuberculosis in children and cows' milk?" To this question he replies as follows:—

"I have shown that a large amount of tuberculous disease exists among children, and that the disease appears at a time of life when cows' milk is the main, or almost the main article of food. These two statements taken together are sufficient to establish a *primâ facie* case against cows' milk.

"Further, I have shown that tuberculosis in children is very largely of the surgical type—that is, it is chiefly glandular, and almost certainly due to the bacillus of bovine tuberculosis which has been taken into the system in food.

"The Report of the Royal Commission establishes a close and clear connection between cows' milk and tuberculosis in children."

Whatever may be the conclusion to be deduced from these and similar facts, it behoves this Association to encourage all Branch Associations to look carefully after the quality of the milk supplied for family use.

The Statutes relating to this subject are sufficient, but they must be enforced. Inspectors must be firmly held to the performance of a disagreeable duty by a strong public sentiment.

An individual may at any time, upon good grounds, enter a complaint and compel attention to the measures necessary to the protection of public health. But this rather disagreeable duty, which is best performed where personal animus has been eliminated, can be most effectively done by an Association whose vigilance can supplement and stimulate the activity of the Local Boards of Health.

CHAPTER XXIII.

The House-fly.

By N. A. COBB.

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THE fly referred to in these pages is the one most commonly found in our houses—the *Musca domestica* of Linnæus. At most seasons nine flies out of ten found in houses are of this kind. In some of the paragraphs, however, the statements are inferences fully justified by experiments with very similar species.

Speaking broadly, man has made the house-fly; it has developed along with the human dwelling. If we had no closed-in dwelling places it is doubtful if the house-fly as at present constituted could continue to exist. It thrives simply because we afford it food, protection and breeding places.

It is a comforting thought that just as we have made the house-fly, so we can unmake it, but it is discouraging to think how long it will take us at the present rate.

Following man into all but the coldest climates, this fly is found in nearly all parts of the world, and its name in many languages denotes the fact that it is an indoor or household insect. In the past it has been looked upon with indifference, or, at most, struck at with objurgation when too familiar. It figures in fable and poetry, not without some degree of praise occasionally. Its reputation as a harmless, innocent, lively, and interesting creature will die hard.

In reality it is one of our worst enemies. Its relations to human health and sanitation are most important, and yet for years all efforts to bring the facts properly to the attention of municipal authorities met with indifference or ridicule. We had become so accustomed to put up with the losses of life and property directly traceable to flies that we no longer had the capacity to grasp the significance of very simple facts—facts demonstrable by almost anyone at the expense of a few minutes, or at most a few hours, of observation or experiment. Again, it was so easy to turn the whole matter into what passed for a joke that the gravity of the subject was lost sight of.

Latterly, however, a gratifying change is taking place in public opinion, due no doubt to what has been discovered about mosquitoes. It has been shown that these latter insects are one of the main factors in the production of diseases that frequently have claimed their victims by hundreds, or even thousands, under most tragic circumstances. No mosquitoes, no malaria. No mosquitoes, no yellow fever.

In sanitary matters the tragedy that appeals to us strongly enough to make us do something worth while must be a tragedy quick in its action

and very awful in its results. One is almost tempted to say that if only a disease is insidious enough it may proceed without opposition, even though we know all about its cause and the means for its prevention. How otherwise can we explain the prevalence of consumption? One hundred yellow-fever victims per week move us more than the regular mortality from consumption that same week, though the latter may be a hundred times the greater.

If consumption laid hold of its victims suddenly and took them off in a few days, what a difference it would make in our attitude towards it! And yet it does far worse. It lingers and tortures its victim, often for years, making life a burden to him and to his friends, a continual source of care and expense, a continual source of sorrow, and, worst of all, a continual menace to all who come in contact with him or his belongings. It does worse, while we too often continue to tread the old beaten track, more or less apathetic, failing to do what we know we ought to do.

However interesting and horrible this psychological aspect of consumption may be, I wish at the present time to do no more than make it illustrate the attitude we have assumed towards flies, which is hardly less interesting and deplorable.

But people are beginning to ask, if the mosquito is so important a factor in human diseases, whether the people who for a generation or more have been calling attention to the house-fly as a distributor of disease may not have a case worthy of attention. The result has been a slow and partial awakening, so that we now have municipalities with sufficient enlightenment and courage to begin the fight against flies. I say courage very advisedly, because it takes courage of an uncommon sort, in matters of this kind, to act up to convictions we know are not shared by the majority of our neighbours. Fighting public indifference is a thankless task, especially when it is accompanied by an undercurrent of half-conscious guilt.

We have been slow to recognize the important part insects play in the spread of disease, because it is difficult to catch them in the act. The insects themselves are small and elusive, and the disease germs even more so. It is a rare occurrence for us to know at what time, or precisely in what manner, we have become infected with the germs of disease. It is almost always a matter of guess-work. If, therefore, any one is sceptical about the dangerousness of flies, and asks to be shown a case in which it can be proved that flies have infected a human being, he sets a difficult task. There is no difficulty whatever in causing flies to come into contact with virulent germs, nor is there any difficulty in showing that they can transfer these germs to healthy animals, and that the animals in consequence become diseased. This has been done, and constitutes one of the main proofs of the dangerousness of flies.

There is plenty of evidence that flies, having come into contact with diseased material, have afterwards by their contact with persons or their food *probably* caused the disease that followed. This, however, does not constitute that rigid and satisfactory proof we would prefer. Nevertheless, such histories can now be assembled in numbers that amount to the strongest kind of circumstantial evidence. There are a number of diseases whose annual increase and decrease harmonize with the abundance of flies in precisely the way they would do if flies were the

inoculating agency. The circumstances fully warrant us in accusing the fly of transferring almost any infectious disease that occurs in fly-time.

The fly's power to spread disease is a direct function of its powers of locomotion. It can fly considerable distances at a high rate of speed. It is quickly carried long distances by trains, boats, teams, animals, and man.

It is possible to get a good idea of a fly's rate of flight in a number of ways. Flies come to ships newly arrived in port across considerable stretches of water. This we know, because a few hours earlier there were no flies on the ship. No communication has been had with land. The flies must have come on their own wings. Occasionally we see a fly follow a team or animal, easily keeping up a good pace. The wing muscles of a fly when weighed are found heavier in proportion than those of any bird so far examined. It is difficult to tire a fly out. Test this by trying to keep one constantly on the wing in a room and you will soon find you have no easy task. All this shows the fly to be no mean navigator of the air.

If such an active and adventurous insect as the fly carries disease germs it will quickly spread them far and wide.

Most of our diseases are caused by invisible germs that lodge and grow in our bodies, destroying our tissues or poisoning us with their excreta. These germs may be brought to us from some sick person by whatever is large enough to carry them and has the opportunity. Combine this fact with what everyone knows about flies, and we see at once the tremendous importance of flies as carriers of human disease germs.

The result of this simple piece of reasoning is so startling that it is often side-tracked by its own importance. It looks so incredible that we hesitate, distrusting our own logic. It seems incredible that men have gone on doing as they have done, and as they are still doing, if the facts are as they seem. The consequences of our reasoning seem so tremendous that we fear there must have been a mistake somewhere. And so we dismiss the idea.

One way to disturb this false security is to interest people in the habits and structure of flies. The more we know about flies the more clear it will become that they are among our worst enemies.

Take for instance the view of the fly resting on glass and viewed from below. Look at the feet, and observe that each of them has two claws and two light-coloured pads. The fly clings to rough surfaces by means of the claws, and to smooth surfaces by a combined action of the claws and pads. The fly's pads are covered with thousands of minute short hairs, sticky at the end. There is no suction—merely adhesion.

Thus it is that all sorts of microscopic particles are moved from place to place on the feet of flies. These particles are rarely of sufficient size to be seen with the unaided eye. Nevertheless, they are constantly present, and the amount of matter thus transferred is relatively considerable on account of the fly's activity. When flies have access to diseased or rotten or foul matter the transfers thus effected are dangerous. All sorts of minute organisms are spread in this way, including diseases of man, animals, and plants. It is impossible to go into details in this place, but it is only right to say that the imagination completely fails to grasp the

far-reaching consequences of this transfer of germs and spores on the feet of flies.

Unfortunately, this is not the worst of it. The transfer of germs by means of the fly's feet is a small matter beside that which takes place through its excreta.

The amount of this fecal matter deposited by flies is of course in proportion to the number of flies. When the flies have access to diseased or rotten or foul matter these faeces are dangerous. If there is any infectious or contagious disease in your neighbourhood in fly-time, beware of flies!

Flies swallow the germs of typhoid in countless millions while feeding on the excreta of typhoid patients. As a result they spread a thousand times more typhoid germs in their excreta than on their feet. My own experiments have shown that the spores of a variety of diseases pass through various species of flies without appreciable change, and that without doubt certain diseases produce odours that entice flies to swallow the spores so that these latter may be more efficiently spread abroad. The germs are just as virulent after passing through the fly as before.

My experiments show that the greatest variety of spores and microbes can, and normally do, pass through flies and germinate afterwards. In fact, the most delicate spores are little if any injured by the fly's digestion. Among those tried are the spores of some of our commonest and most destructive moulds and spores of nearly all the diseases of sugar-cane and those of numerous other plants. In short, it rarely happens that spores of any kind swallowed by a well-fed fly do not appear in an hour or so in the faeces of the fly in an uninjured condition, such that they germinate readily afterward. Finally, as might be expected, examination of the excreta of flies captured in the open shows it to contain a great variety of spores in a living condition.

I find the digestion of the adult fly to consist in the absorption of those substances readily soluble in its weak digestive fluids and the evacuation of all others. In accordance with this principle the fly is an enormous feeder. At a single meal it frequently swallows nearly half its own weight of food. In the course of a day a well-fed fly probably as a rule swallows more than its own weight of food.

During the summer the fly population of any large town must number millions. Comparing this fact with the food habits of the fly, we see at once the importance of the rôle they play in our affairs, more particularly in view of their disease-carrying powers. I venture to think the most powerful imagination fails to take in the vast multitude of conclusions that follow from these simple lines of reasoning.

The fly does far worse things than get into the ointment, for unless we take care he gets into or on to pretty much everything we eat or drink. Such an occurrence is not simply disgusting; it is more or less dangerous, and the danger lies in the introduction into our bodies of disease germs. This danger is far more real than commonly supposed. There can be no doubt that much sickness is started in this way.

The question is, what ought we to do about it? The answer is simple, and it is that we ought to take greater precautions, both individually and collectively—

First.—To fully inform ourselves on this subject by reading and observation.

Second.—To prevent the multiplication of flies. Abolish their breeding places. Protect food and refuse so that flies cannot get at them.

Third.—To keep flies out of our buildings and streets.

Fourth.—To employ all reasonable agencies to destroy flies that come into existence in spite of our other precautions.*

FIGHT THE FLIES.

[A circular recently published by the American Civic Association, which is a summary of the mass campaign against the fly.]

It is at this time of the year that the house-fly begins to take on life for the ensuing spring and summer; eggs laid last fall will soon begin to hatch. At first he is only a little worm, wriggling his tiny grub-like form in some incubating pile of filth. He is usually found in the manure pile, the outhouse, or the mound of rubbish or garbage in the back yard. In this condition he is easily killed, and it should be the duty of every person to kill him now. The house-fly could not exist if everything were kept perfectly clean and sanitary. Exterminate the fly-worms, do away with its breeding places, and there will be no flies. If we are to fight the flies this summer we should use every agency possible, and the best way to fight them is to prevent their breeding.

The common house-fly is coming to be known as the "typhoid fly," and when the term becomes universal greater care will be exercised in protecting the house from his presence.

Flies kill a greater number of human beings than all the beasts of prey, with all of the poisonous serpents added. They spread disease which slays thousands, while big powerful beasts kill single victims.

As soon as the fly comes out of his shell he is full grown and starts out in the world to make a living, and if your home is not clean he knows it by the odour. They can discern an odour of filth for miles.

As much as they like filth odours they dislike other odours. Where a bad odour will attract them the clean odour will repulse them. A pleasant-smelling substance—the fragrance of flowers, geraniums, mignonette, lavender, or any perfumery—will drive them away.

He is a frequenter of offal. The fly lays her eggs in the manure pile or other objectionable filth. All the germs—all the imaginable abominable microbes—fasten themselves on the spongy feet of the fly. He brings them into the house and wipes them off his feet. The fly you see walking over the food you are about to eat is covered with filth and germs. If there is any dirt in your house or about your premises, or those of your neighbours, he has just come from it. It is his home. Watch him as he stands on the lump of sugar industriously wiping his feet. He is wiping off the disease germs, rubbing them on the sugar that you are going to eat, leaving the poison for you to swallow.

He wipes his feet on the food that you eat, on the faces and on the lips of your sleeping children. This does more to spread typhoid fever

* For further information on the ravages caused by flies see "Economic Loss to the People of the United States through Insects that Carry Disease," by Dr. L. O. Howard, August, 1909.—*National Geographic Magazine*, pp. 735-749.

and cholera infantum and other intestinal diseases than any other cause.

Disease attacks human beings only when they are brought in contact with it. For instance, you cannot get typhoid fever unless you swallow the germs of typhoid, and you do not swallow these germs unless they get on the food you eat or in the liquids you drink, or on the glasses or cups from which you drink.

Not only does he scatter the seeds of disease from his body over your food, but before your fruit and vegetables are placed before you they have been subjected to his filthy habits, either in the kitchen or in the stores, where he flies from the horse dirt in the middle of the street to the tubercular sputum on the sidewalk, and then back to the foodstuffs displayed for sale.

Many diseases which are attributed to milk and water originate through flies. A polluted brook, river, or lake furnishes germs from sewers, and flies in millions settle on the refuse that washes along the water's edge.

Intestinal diseases are more frequent whenever and wherever flies are most abundant, and they and not the summer heat are the active agents in its spread.

There is special danger when flies drop into such fluid as milk. This forms an ideal culture material for the bacillus. A few germs washed from the body of one fly may develop into millions within a few hours, and the person who drinks such milk will receive large doses of bacilli, which may later cause serious sickness.

Therefore, keep the flies away from the milk.

DON'TS

Don't allow flies in your house.

Don't permit them near your food, especially milk.

Don't buy foodstuff where flies are tolerated.

Don't have feeding places where flies can load themselves with ejections from typhoid or dysenteric patients.

Don't allow your fruits and confections to be exposed to the swarms of flies.

Don't let flies crawl over the baby's mouth and swarm upon the nipple of its nursing bottle.

Clean up your premises inside and out, and then, as much as you can, see that others do the same.

Strike at the root of the evil. The house-fly breeds in horse manure, kitchen offal, and the like. Dispose of these materials in such a way that the house-fly cannot propagate. Screen all windows and doors, and insist that your grocer, baker, and everyone from whom you buy foodstuffs does the same.

There is more health in a well-screened house than in many a doctor's visit.

After you have cleaned up your own premises inspect the neighbourhood for fly-breeding places. Call the attention of the owner to them and, if he does not remove them, complain to the Board of Health.

**NOT LESS THAN 95 PER CENT. OF THE PESTS ARE BRED
IN THE STABLE.**

All stables should have a manure bin with a door at the side and a wire screen on the top, that the larva deposited in the manure before it was placed in the bin will be screened when hatched, and, as flies seek light and come to the top of the bin, they can be easily killed by burning paper or some other device.

The fly has a thirst only equalled by his hunger; place a dish of poisoned water in the stable and a greater part of the flies hatched there will be killed.

Flies are nature's scavengers, fulfilling the same function that some bacteria do, but become an intolerable nuisance and danger when entering human dwellings and by contamination of food.

The presence of flies is a direct evidence of careless housekeeping and of the existence of filth in some form about the premises, and are more dangerous than the good housekeeper's terror found in bedrooms.

Remember that wherever absolute cleanliness prevails there will be no flies. Look after the garbage cans. See that they are cleaned, sprinkled with lime or kerosene oil, and closely covered.

Remove all manure from stables every three or four days, and when removed keep in a tight pit or vault, so flies cannot breed in it.

Lye, chloride of lime or blue vitriol water, crude carbolic acid or any kind of disinfectant may be used.

Keep flies away from the kitchen. Keep flies out of the dining-room and away from the sick, especially from those ill with contagious diseases.

Screen all Food.—Apply this rule not only to food prepared at home, but to foodstuffs offered for sale, and especially fruits, salads, and all other things which do not require to be cooked.

Prevent consumptives from expectorating where flies can feed upon it.

HOW TO KILL FLIES.

To clear rooms of flies CARBOLIC ACID may be used as follows: Heat a shovel or any similar article and drop thereon 20 drops of CARBOLIC ACID. The vapour kills the flies.

A CHEAP and perfectly reliable FLY POISON, one which is not DANGEROUS TO HUMAN LIFE, is BICHROMATE OF POTASH in solution. DISSOLVE ONE DRAM, which can be bought at any drug store, in TWO OUNCES OF WATER, and add a little SUGAR. Put some of this solution in SHALLOW DISHES, and distribute them about the house.

Sticky fly paper, traps and liquid poisons are among the things to use in KILLING FLIES, but the LATEST, CHEAPEST and BEST is a solution of FORMALIN or FORMALDEHYDE in water. A SPOONFUL of this liquid put into a QUARTER OF A PINT OF WATER and exposed in the ROOM, will be enough to KILL ALL THE FLIES.

To quickly clear the room where there are many flies: BURN PYRETHRUM POWDER in the room. This stupefies the flies, when they may be swept up and burned.



By courtesy of Dr. G. D. Porter.

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"Only those are received and given treatment who are suffering from pulmonary tuberculosis, or who have some taint of the disease which may be eradicated by preventative treatment. The next most important part of the work is the instruction, control and care of the patients at their homes. This is done through the regular visits of the Inspector and nurses and through these channels also is handled the large part of the Relief work to the more needy patients. Sputum cups are supplied at the homes of the patients by the Inspector as well as a large amount of literature on care and instruction."—E. S. HARDING, *Hon. Secretary*.



By courtesy of Dr. G. D. Porter.

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"Primarily for advanced cases to provide every possible attention and comfort in their closing days, and to remove a source of contamination and danger from those who would run every risk of taking the trouble from the close attention that is demanded in the later periods as well as from the increased virulence which accompanies this hopeless termination."—Dr. K. G. M. GORDON, *Medical Supt.*

CHAPTER XXIV.

Care of the Teeth.

CONDENSED FROM PAMPHLET ISSUED BY "The Education Department, Ontario."

FROM the earliest historical times attention to the teeth was considered a matter of importance. Chinese and Hindu records dating back to 1500 B.C. contain references to the subject. The ancient Romans practised dentistry in a crude way and made artificial teeth of ivory and gold.

The profession of dentistry has in modern times reached a high state of perfection in the matter of repair of diseased teeth and the adaptation of artificial substitutes, and has turned of later years more especially to the study of what is known as oral prophylaxis or the prevention of disease and defects of the organs of mastication. The dentistry of the future will be preventive more than curative.

DENTISTRY OF THE FUTURE.

A great many forms of disease are caused by germs which enter the body, chiefly through the mouth, which latter has been aptly termed "the vestibule to the whole system." The members of the profession of dentistry realize this fact, and are putting forth their best efforts to take advantage of the opportunity, which is theirs, as guardians of the mouths and teeth of the public, to not only prevent destruction of the teeth by caries, but also to control, in a large degree, many other forms of disease.

FUNCTIONS OF THE TEETH.

The teeth have, among others, three most distinct functions, viz., mastication of food, assistance in articulation of words, and that of giving beauty and expression to the face.

MASTICATION.—This is the chief function of the teeth. The crushing of the food is not the only end accomplished in mastication, but during the process the glands situated in the mouth are stimulated to secrete large quantities of saliva; these fluids become incorporated with the food and perform the first step in digestion. If the teeth and other tissues of the mouth are in an unhealthy state, their use is avoided, and the soft, pulpy articles of diet are chosen—those which will *slip down* with little or no mastication. In such cases the food is taken into the stomach without the normal quantity of saliva which is required in digestion. The food should be masticated until it is ground to the very finest consistency.

To give a little idea of what thorough mastication means, tender beefsteak should be crushed between the teeth about 50 or more times

before swallowing; roast pork, 30 to 40 times; tender chicken, 30 to 40 times; bananas, which are usually bolted, and are very injurious on this account, should be chewed 20 times at least to give the salivary glands an opportunity to secrete sufficient saliva to help in digestion.

If the food is bolted and not mixed properly with the saliva, it will not be thoroughly digested, and as a consequence, tainted breath, headache and a train of other ill effects will follow.

ARTICULATION.—The full complement of teeth in normally developed jaws is necessary for the distinct pronunciation of words, a matter of particular importance to public speakers and singers.

Irregularities of the teeth should be corrected just as soon as they manifest themselves. The treatment is almost painless and fairly easy in the case of the child, but becomes more complicated and difficult as years advance.

The loss of even one tooth may affect the speech somewhat, and the result of the extraction or decay of several is sure to be disastrous. The posterior teeth are really more valuable than those in front, perhaps not from the standpoint of appearance or articulation, but in general usefulness. Their loss, too, has more effect upon the face than most people realize.

EXPRESSION.—No organ, or set of organs, has greater effect upon the expression of the face than the teeth. If they are decayed or irregular, an otherwise beautiful face may be marred very decidedly.

The cleanliness of our teeth is indicative of our tastes. A particular charm in many faces is the regularity and beauty of the teeth, giving to the mouth a natural and pleasing expression. If any are lost, or do not lock correctly with their antagonists when erupting, the natural development of the entire structure will be interfered with and irregularity will follow, changing more or less the whole expression.

Adenoids, an hypertrophy of the tonsil situated at the back of the nose, a condition from which many children suffer, have often a very marked effect upon the teeth, and consequently upon the face. This enlargement of the tonsil closes the posterior openings of the nose, and the child is compelled to breathe through its mouth. If this abnormal respiration continues over a long period, the upper front teeth will protrude, and the lower lip roll in behind them. This disfigures the face very decidedly. The adenoids should be removed by the surgeon and the teeth drawn back to their normal position by the orthodontist or dentist, so that the child can close its lips and breathe normally.

WHAT IS DECAY OF THE TEETH, AND WHAT IS THE CAUSE?

Dental caries is a breaking down of tooth tissue, resulting from the action of certain species of micro-organisms. Tooth decay is persistent; it goes on very rapidly in some mouths, and more slowly in others, according to the condition of the secretions, the general health and the care taken in cleansing the mouth and teeth.

Neglect of proper cleanliness of the mouth is one of the chief causes of tooth destruction, as well as other diseases.

The particular germs which cause decay of the teeth attach themselves to the enamel, which becomes attacked by the acid products of the action of the germs upon particles of food remaining in the mouth. When the enamel is after a time eaten through, the dentine, which forms the greater bulk of the tooth, is rapidly destroyed and a large cavity may result. Sweet and starchy foods form the best soil for the growth of these germs and furnish material for the ready production of acids; hence the well-known ill-effects of sweets upon the teeth.

WHAT CAN BE DONE TO PREVENT DECAY?

(1) Precautions should be taken early. Even the temporary or milk teeth should be watched and kept in perfect condition until their successors displace them.

(2) From the time the first permanent teeth appear, inspection at regular intervals by the dentist should be the rule, to the end that all evidences of disease may be remedied.

(3) Irregular teeth should be taken in hand early. Much can be done to rectify irregularities, with gain to the personal appearance and to the benefit of the adjoining teeth.

(4) The teeth decay in some mouths sooner and more rapidly than in others. This is not due so much to natural softness of the teeth as to other abnormal conditions, especially an habitual unhealthy state of the secretions of the mouth. Frequent cleansing and thorough mastication do much to remedy this, but it may depend on general ill-health which needs attention.

Mastication plays an important part in the preservation of the teeth. Any race of people who live upon a class of food that requires a great deal of mastication before it can be swallowed invariably have little or no decay of the teeth, because during the vigorous chewing of the food the teeth are brushed and the gums massaged very decidedly. Watch a horse chew his food; his teeth do not decay, and rarely give any trouble, except when worn down by hard mastication or broken off by accident of some kind. The hay and oats are hard substances, and during the thorough mastication which they receive in order to be swallowed, the teeth are beautifully polished. The oats contain a great deal of starch, the very substance upon which the germs of decay thrive best, and yet decay does not occur.

It is believed that our forefathers had better teeth than we, and this is accounted for chiefly by the fact that their diet consisted of plain materials that required vigorous chewing before they could be swallowed. They had not, as we have to-day, so many forms of sweet, mushy food; they did not, perhaps, bother very much with tooth brushes either, but their food did the work which we must do now with our brush. It is well to have for each meal at least one article of diet which requires thorough mastication, and for a final dessert nothing better can be eaten than a good apple, as it massages the gums and clears away to a certain extent any food which has lodged in the interspaces between the teeth.

It is unwise to use liquids with which to "wash" the food down into the stomach. If one desires to drink during meals he should do so when the mouth is empty.

Children should be given plenty of food that requires thorough mastication before it can be swallowed; instead of mincing it up for them, *let them do the mincing with their teeth*. It has been suggested that "if children could be sent to a chewing school, as they are now sent to a kindergarten, there would be a marked improvement in the race."

The teeth, and also the soft tissues surrounding them, require plenty of exercise, in order to develop them to their most perfect condition, just as do all other parts of the body.

HOW TO CLEANSE THE MOUTH AND TEETH.

The best-known means of cleansing the mouth and teeth other than by mastication is by the intelligent use of a good tooth brush, together with plenty of moderately cold pure water. Most brushes which are offered for sale are too large, but it is possible now to obtain brushes which are nearly ideal. One should use a brush of such a size that it may be readily passed between the cheek and the most posterior tooth. In the permanent set this is the wisdom tooth, which rarely receives proper care, because a large brush will not reach it handily, and thus it often decays early, and is looked upon by many as a tooth of poorer quality than the rest, which is not necessarily the case.

The head of an ideal tooth brush for an adult—that is the portion which carries the bristles—should not be longer than one and a half inches or wider than one-third of an inch. The bristles should be arranged in two rows, each of about seven good-sized *tufts of equal length*, and one tuft additional to round off the end. The tufts of each row should be directly opposite each other and the bristles of unequal length, the centre bristles in each tuft transversely being slightly longer than the rest, giving a serrated face to the brush. The bristles should be no longer than half an inch, and of medium stiffness for the average adult. Where the gums are inflamed, softer bristles are indicated for a time, until the tissues become normal and healthy.

Young children, or those wearing orthodontia appliances, should use a brush with but one row of six or seven tufts, the bristles being shorter than those in the adult's brush.

The head as well as the handle of the brush should be slightly curved, the head a little more than the handle, with the concavity on the side containing the bristles.

There is a right and a wrong way to use a tooth brush, and most people employ the latter method. The old see-saw manner of using the brush is a very poor one, as only the high spots are brushed. The motion should be a *vertical* one, placing the brush high (or low, if for the lower teeth) upon the gums and then rotating it so that the bristles pass over both the gums and teeth. A very short, horizontal motion will drive the bristles between the teeth, dislodge the food, and prevent the formation of tartar. To cleanse the lingual, or inner

surfaces, the brush should be used in a similar manner; for the upper, place the ends of the bristles in the centre of the roof of the mouth, and roll it down over the gums and teeth; for the lower, raise the tongue and place the brush low down upon the gums, then roll it up over the ends of the teeth; the bristles upon the end of the brush only may be used in some parts. These movements must be repeated several times, using plenty of water. The grinding surfaces are cleansed by the horizontal use of the brush, as is usually practiced for all surfaces of the teeth.

It may be necessary occasionally to use a good tooth powder or a little camphorated chalk to remove stains, but any preparation used should be one which does not contain ingredients that are injurious to the teeth, and whatever is used should be carefully washed from around the teeth.

Rinsing the mouth thoroughly is an excellent means of dislodging any collection between the teeth. It is possible by the action of the tongue and cheeks to force a liquid back and forth between the teeth with considerable pressure. Try it. Many persons do not know how to properly rinse their mouth. A very palatable and refreshing wash for rinsing the mouth may be made by adding about 10 drops of oil of peppermint to three ounces of water, using a few drops of this solution in sufficient water to rinse the mouth two or three times.

No preparation could be used in the mouth that will kill the germs; they must be brushed away.

Tooth soaps are very injurious and should not be used. Pastes, as a rule, are not as good as powders, because most of them contain sugar, simple syrup, etc., substances which are favourable to the development of bacteria. The advice of a dentist should be sought in reference to the selection of any preparation with which to cleanse the teeth, as many of the articles upon the market for this purpose are very injurious. Some persons use powdered charcoal, pumice or cigar ashes. One might use something of this kind once in several weeks, if the teeth become stained, but if the brush is diligently used two or three times a day at least, with the addition of a good tooth powder once perhaps every three or four days there will not be much occasion to use a gritty substance.

It is advisable to have the teeth thoroughly scaled and polished by a dentist two or three times a year, because the approximal surfaces cannot be thoroughly cleansed by the brush.

When food lodges between the teeth, it can best be removed by the use of a quill toothpick. Toothpicks of wood are usually too large and rough, and considerable damage may be done to the gum tissue by their use. Where food lodges there is something wrong, and a dentist should be consulted, as the continual crowding of food into these spaces presses back the soft tissues and exposes the necks of the teeth, and thus decay starts at a point where the germs cannot be brushed away conveniently.

With care, the approximal surfaces of the teeth may be cleansed and polished by means of ordinary rubber bands or floss silk, but the use of these is a dangerous proceeding, because if the silk or rubber band is permitted to snap down upon the gums after it passes the "tight point" between the teeth, it will set up an inflammation in the soft tissues that

will cause them to recede. These are all right when used by a careful dentist, but not so in the hands of the average person.

WHEN SHOULD THE TEETH BE BRUSHED?

To cleanse the mouth and teeth should be the very first duty in the morning, in order to clear away as thoroughly as possible the germs which may have fastened themselves upon the teeth during the hours of sleep, when the tongue and salivary glands are inactive. It is desirable to get rid of these germs, so that they will not be brushed off by the food in mastication and carried into the stomach along with the breakfast. The teeth should be brushed after each meal to remove all particles of food which may have lodged around them. The most important time of all, so far as the preservation of the teeth is concerned, is after the last meal of the day, taking care to remove thoroughly all particles of food at this cleansing. During the hours of sleep the saliva is not flowing freely, neither is the tongue brushing the surfaces of the teeth; if there is food lodged around them, the germs will have several hours during which to grow undisturbed, and having this grand opportunity, night after night, for years, is it any wonder that they destroy teeth? Persons in delicate health, or those whose teeth are very susceptible to decay, would do well to cleanse the mouth and teeth before each meal; it will prevent the entrance into the stomach of many germs which more or less interfere with normal digestion.



By courtesy of Mr. S. C. Knowles, Director of the Elizabeth McCormick Memorial Fund, U. S. G. P. O.

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IN THE CHICAGO OPEN-AIR SCHOOL IT HAS BEEN FOUND THAT COTS AFFORD MORE RELAXATION THAN RECLINING CHAIRS.

"The most important plan in the conservation of our natural resources is the protection of the child; 'For of thorns men do not gather figs,' nor can a vigorous race spring from wanklings."—
Dr. Stoll.

CHAPTER XXV.

National Vitality.

The following pages are selected from "National Vitality: Its Wastes and Conservation," by Professor Irving Fisher, published as a U. S. Senate Document and forming part of the Report of the National Conservation Commission.

ABSTRACT.

THE problem of conserving natural resources is only one part of the larger problem of conserving national efficiency. The other part relates to the vitality of our population. The two parts are closely interwoven. Protection against mining accidents, forest fires, floods, or pollution of streams prevents not only loss of property, but loss of life. The prevention of disease, on the other hand, increases economic productivity.

So far as we can compare vital and physical assets as measured by earning power, the vital assets are three to five times the physical. The facts show that there is as great room for improvement in our vital resources as in our lands, waters, minerals, and forests. This improvement is possible in respect both to the length of life and to freedom from disease during life.

Contrary to common impression, there is no iron law of mortality. Recent statistics for India show that the average duration of life there is less than twenty-five years. In Sweden it is over fifty years; in Massachusetts forty-five years. The length of life is increasing wherever sanitary science and preventive medicine are applied. In India it is stationary. In Europe it has doubled in three and a half centuries. The rate of increase during the seventeenth and eighteenth centuries was about four years per century, during the first half of the nineteenth century about nine years per century, during the latter half of the nineteenth century about seventeen years per century, and in Germany, where medical and sanitary science has reached the highest development, about twenty-seven years per century.

There is no need, however, of waiting a century for this increase. It could be obtained within a generation. Three-fourths of tuberculosis could be avoided. Eighteen experts in various diseases, as well as vital statisticians, have contributed data on the ratio of preventability of the ninety different causes of death into which mortality may be classified. From these data it is found that fifteen years at least could be at once added to the average human lifetime by applying the science of preventing disease. More than half of this additional life would come from the prevention of tuberculosis, typhoid, and five other diseases, the prevention of which could be accomplished by purer air, water, and

milk. In Lawrence, Mass., after the installation of a pure-water supply, the death rate from typhoid was reduced by 80 per cent. For every death thus saved from typhoid, two or three deaths are saved from other diseases.

Judging from the English statistics of illness, we must conclude that at all times in the United States about 3,000,000 persons are seriously ill, of whom about 500,000 are consumptives. Fully half of this illness is preventable.

If we appraise each life lost at only \$1,700 and each year's average earnings for adults at only \$700, the economic gain to be obtained from preventing preventable disease, measured in dollars, exceeds one and a half billions. This gain, or the lengthening and strengthening of life which it measures, can be secured through medical investigation and practice, school and factory hygiene, restriction of labour of women and children, the education of the public in both public and private hygiene, and through improving the efficiency of our municipal, state and national health service. Our National Government has now several bureaus exercising health functions, which only need to be concentrated under one department to become co-ordinated parts of a greater health service worthy of the nation.

CONSERVATION THROUGH PERSONAL HYGIENE.

Section I.—Its Importance.

Following public and semi-public hygiene, we arrive at what is in many respects the most important subject of all—personal hygiene. It is quite true that the individual is often at the mercy of unclean streets, bad drainage, impure water and food, and other shortcomings of public and semi-public hygiene. On the other hand, his own personal interest is necessary in order to form the public opinion which alone can result in effective public and semi-public hygiene, while that interest is still more necessary to make such hygiene apply directly to his own person. Clean streets are of use only as they make the air breathed purer, but they are of little avail to the household which does not ventilate its rooms or which keeps them in a state of filth. The milk supply of a city may be ideal, but all the pains to make it so will be set at nought if the individual consumer allows the milk to be contaminated after it is delivered. The labelling of foods and drugs will not prevent self-poisoning through alcohol, nor will the elimination of preservatives from foodstuffs and the enforcement of sanitation in their manufacture be of avail if in their preparation for the table they are subjected to disease and dirt. Thus at every point of hygienic progress there must be individual co-operation with public efforts.

When, contrariwise, health organizations and officials are inefficient, the individual may, in spite of these difficulties, often maintain good health. In New York a woman who was the occupant of a tenement overcame tuberculosis by sitting daily on her fire escape. The air was not the best, but it was much better than indoors. Similar results have been obtained by workmen in Brockton shoe factories, who, in spite of insanitary

working places, and without cessation of work, conquered tuberculosis by sleeping on the roofs of their houses at night.

Personal hygiene means the strengthening of our defences against disease. Public hygiene seeks to destroy the germs before they reach our bodily defences. These two branches of hygiene are simply the two forms of warfare, defensive and offensive. Both are of transcendent importance, but the defensive warfare is more within our power. We always have our defending garrison, the white blood corpuscles, to deliver us from our enemies.

Section II.—Branches of Personal Hygiene.

Personal hygiene comprises hygiene of environment (air, soil, dwelling, clothing); hygiene of nutrition; and hygiene of activity.

Man is more dependent upon the atmosphere than upon any other environmental factor. His body is bathed in air and his most vital function, respiration, depends upon it. Deprived of air, he will shortly suffocate. If the air is confined and impure, his health will be affected. Ideal air should first of all be pure—*i.e.*, free from injurious bacteria, from dust, smoke, and noxious gases. It should also conform to certain standard conditions of humidity and temperature. In this field lie the sciences of climatology and meteorology. Man learned long ago how to make himself almost independent of climatic and atmospheric conditions by the use of dwellings and clothing. These contrivances, however, while protecting him from the elements, have brought evils of their own. The great scourge of tuberculosis, for instance, is principally an indoor disease.

Intimately related to the appropriation, through the lungs of oxygen from the atmosphere is the ingestion of food and drink through the alimentary canal. Normal health conditions demand in the case of ingested materials, as in the case of respired air, the greatest possible purity, freedom from injurious bacteria, and the absence of substances hurtful mechanically or chemically.

Finally, the ideal conditions of health require perfect balance of work, play, and sleep.

Section IV.—The Hygiene of Nutrition.

A primary necessity for hygienic living is good drinking water. The modern man of means insists upon good water, and, as a result, the travelling public is now able to get first-class water in cars, hotels, and other public places. The improvement was brought about by the appreciation by the consumer of the danger of drinking impure water. It is the consumer who has it in his power to bring about the necessary reforms in public hygiene. When he really values hygienic environment producers will supply it.

The scientific study of diet has only just begun and few authoritative results can yet be stated. To avoid a lengthy review of controversial literature it seems best to pass the subject over rapidly, referring the reader for further information to some of the principal books on the subject.

We have already seen the surprising improvement in endurance which followed the adoption of thorough mastication in place of the ordinary food bolting. Mr. Gladstone used to be noted for his care in slowly masticating his food, and latterly Mr. Horace Fletcher has aroused the interest of the public in the subject in Europe and America. He has also stimulated a large number of physiologists to study the subject of mastication, the protein ration, and their relation to strength and endurance.

A great deal has been written as to what foods are best. There exist various dietetic cults, such as vegetarians and fruitarians, raw-food advocates, etc. The question of what foods are ideally best is too large a one to be entered upon here. The evidence seems to point to a general conclusion that no hard and fast rule of exclusion is advisable, and that the value of different foods varies with the individual and with his activity, locality, physical condition, etc. His own instinct, restored and educated by avoiding the pernicious habit of food bolting, may be made a truer guide than the wisest physician or physiologist. The same rule applies to the amount of food to be eaten, as well as to the proportions of protein, fat, carbohydrates, and mineral salts. Food bolting often leads to overeating.

It should be noted that the conclusions of Chittenden and others are not in favour of a vegetarian régime, but of a low protein régime, whether vegetarian, lacto-vegetarian, or with flesh foods in moderation. The main point is moderation of the foods highest in protein, such as the whites of eggs and meats (especially lean meats).

It would seem that the safest course for the average man is to follow the appetite, simply guiding it toward a low protein diet by thorough mastication, and by giving the benefit of the doubt to foods low in protein. A reduction in the use of meat will increase, and probably cheapen, our national food supply. The raising of cattle requires much more land than the raising of cereals, fruits, nuts, and vegetables yielding the same amount of food value. As this will be a most important economic problem during the next hundred years, the question of the character of our food supply should be most carefully considered in the study of the conservation of natural resources. It is interesting to note, in this connection, that during the last century the consumption of flesh foods in the United States has considerably decreased.

As to exercise, a healthy organism must call into play every function daily, both mental and physical. One of the evils of the division of labour, which civilisation has brought, is that the sedentary worker does not have enough physical exercise, but too much mental exercise, while the situation is just the opposite in the case of the workingman.

In the last three years considerable evidence has accumulated to show that the sitting posture of the sedentary man tends sooner or later to produce nervous prostration, and that the ordinary chair invites this effect by producing a bent attitude, both in the forward direction and in the shoulders. The effect of the former is to tax the splanchnic nerves and congest the portal circulation. The splanchnic area, which is enormous, is a sort of overflow tank for the blood. If the muscles of this

area are allowed to relax through improper position in standing or sitting, the result is the stagnation of the blood in the abdomen, and this in turn results in a vicious circle of evil effects. Since much of our life is spent in chairs, this fact is of no small importance. Improperly made school chairs and unhygienic habits of sitting in them may start off millions of young lives with round shoulders, curved spines, and the later effects of portal congestion.

The ordinary working man works two or three hours too much every day. Nearly every man overworks himself, takes insufficient rest and recreation, and, worst of all, cuts off his normal portion of sleep. Fatigue ought to be "avoided like poison," because, physiologically, it is really poison.

An animal lives a much more healthy life than the average man, because an animal follows instinct, while a man to a large extent endeavours to substitute for his instincts rules which are very often false. One of the instincts constantly disregarded by man is that which finds its expression in fatigue. The ordinary man working for someone else is compelled to toil beyond the fatigue limit; and, on the other hand, if a man is in business for himself, he does the same thing of his own will. Although no one knows what sleep is, it serves, according to the best theory, to eliminate poisons and to rebuild tissue. With rest is closely associated recreation. Play practices the power of a child's mind, while contest among children develops self-control. Similarly, adults are rested by play or recreation, their minds and bodies are relaxed, while their contests of mimic warfare develop their powers of will and effort.

PERSONAL HYGIENE IN GENERAL.

Personal hygiene is only beginning to be generally exploited. Most persons leave their health to be attended to by physicians and health officers. So far as practised at all, personal hygiene has been confined chiefly to invalids and athletes. Even by them it is usually practised to tide over an illness or to prepare for a contest. But it is manifest destiny that a wise economy of vitality will sooner or later be practised. Waste of vital resources is as irrational as waste of natural resources. Neither is inexhaustible and both must be conserved. Thoughtlessness and ignorance are the reasons for the appalling waste of both now going on. Even people who do not definitely abuse their strength by definite excesses are liable to waste it gradually. Slightly unhygienic habits grow, and their effects are doubtless cumulative. It is well known that even a so-called "ventilated house," if lived in long enough without sufficient outdoor life, may induce tuberculosis. This must be through the repetition of an infinitesimal injury produced through each respiration eighteen times a minute for twenty-four hours a day for half a lifetime.

The obstacles to hygiene which have accumulated with civilization are almost as numerous and as small as the barnacles which impede a ship. To remove them is in large part "to return to nature." Many of the inventions of which civilization boasts have had an unwholesome side. The invention of houses has made it possible for mankind to

spread all over the globe, but it is responsible for tuberculosis, especially after glass was devised, which, while letting in the light keeps out the air. The invention of cooking and preparing foods has widened the variety of man's diet, but has led to the decay of his teeth. The invention of the alphabet and printing has made possible the accumulation of knowledge, but it has produced eye strain with all its attendant evils. The invention of chairs has added to human convenience, but has led to spinal curvature and abdominal congestion. The device of a division of labour has added to wealth, but has destroyed the normal balance of mental and physical work, recreation, and rest. Similar fault may be found with clothing, especially corsets, shoes and hats, and with numerous other contrivances. Yet it would be foolish, even if it were possible, to attempt to "return to nature" in the sense of abolishing civilisation. We must not go backward, but forward. The cure for eye strain is not in disregarding the invention of reading, but in introducing the invention of glasses. The cure for tuberculosis is not in the destruction of houses, but in devices for ventilation. It is a little knowledge that is dangerous. Civilisation can, with fuller knowledge, bring its own cure and make the "kingdom of man" far larger, even in respect to hygienic conditions, than "nature" people can ever dream of.

Unhygienic customs and fashions are exceedingly slow to yield, but they do yield in the end. It should be the part of intelligent men to lead in hygienic reform, not by intolerant and impatient abuse of their fellow-men, but by the quiet force of example. The intolerant and impatient reformer does incalculable harm, for he takes no account of that subtle perversity of human nature which resents his interference. Equally harmful is the man who seeks only to imitate the crowd, who condones the vices of his time and country.

But we must always bear in mind what has been called the "psychology of the crowd." Tarde, Le Bon, Baldwin, Ross, and others have shown that society is largely ruled by customs which grow out of imitation. In order that any social custom shall be changed, initiative is necessary. The upper classes should take the lead, for any reform will spread many times more quickly when the initiative comes from above than when it comes from below. Western civilization has made its marvellously rapid progress in Japan for the simple reason that the Mikado approved, and marvellously slow progress in China for the simple reason that the Empress disapproved.

The change constituting hygienic reform will be brought about most rapidly by the influence on the young. If children in their homes and schools are given proper models for imitation, the public opinion which they will form may make a revolution in a single generation. Anyone who realizes the almost resistless force of the principle of imitation, especially when applied to children, will receive a new sense of the responsibility he takes in setting an example to the young. It is probably through the love of the next generation, rather than through any selfish care for the present, that men and women now living will take the most pains to secure the best results in bringing about the change in living conditions for which every hygienist hopes.

THINGS WHICH NEED TO BE DONE.

Enumeration of Principal Measures.

In order that national vitality may reach its maximum development, many things need to be done. Among them are the following:—

1. The National Government, the States, and the municipalities should steadfastly devote their energies and resources to the protection of the people from disease. Such protection is quite as properly a governmental function as is protection from foreign invasion, from criminals, or from fire. It is both bad policy and bad economy to leave this work mainly to the weak and spasmodic efforts of charity, or to the philanthropy of physicians.

2. The National Government should exercise at least three public health functions: First, investigation; second, the dissemination of information; third, administration.

It should remove the reproach that more pains are now taken to protect the health of farm cattle than of human beings. It should provide more and greater laboratories for research in preventive medicine and public hygiene. Provision should also be made for better and more universal vital statistics, without which it is impossible to know the exact conditions in an epidemic, or, in general, the sanitary or insanitary conditions in any part of the country.

It should provide for the dissemination of information in regard to the prevention of tuberculosis and other diseases, the dangers of impure air, impure foods, impure milk, imperfect sanitation, ventilation, etc. Just as now the Department of Agriculture supplies specific information to the farmer in respect to raising crops or live stock, so should one of the departments, devoted principally to health and education, be able to provide every health officer, school-teacher, employer, physician and private family with specific information in regard to public, domestic, and personal hygiene.

It should provide for making the national capital into a model sanitary city, free from insanitary tenements and workshops, air pollution, water pollution, food pollution, etc., with a rate of death and a rate of illness among infants and among the population generally so low and so free from epidemics of typhoid or other diseases as will arouse the attention of the entire country and the world.

There should be a constant adaptation of the pure-food laws to changing conditions. Meat inspection and other inspection should be so arranged as to protect not only foreigners, but our own citizens. The existing health agencies of the Government should be concentrated in one department, better co-ordinated and given more powers and appropriations.

3. State boards of health and state legislation should provide for the regulation of labour of women, should regulate the age at which children shall be employed, make reasonable regulations in regard to hours of labour, and against the dangers in hazardous trades, and especially against the particular dangers of dust and poisonous chemicals; should make

regulations for sanitation and provide inspection of factories, schools, asylums, prisons, and other public institutions. Where municipalities have not the powers to enact the legislation above mentioned with reference to local conditions, the necessary legislation or authority should be provided by the State. Or where by reason of the small size of the town no efficient local action is possible, the State should exercise the necessary functions. It should, in such cases, advise and supervise local boards of health. It should have an engineering department and advise regarding the construction of sewers and water supplies. Pollution of such supplies, unless entirely local, should be prevented by the State, which should be equipped with laboratories for the analysis of water, milk, and other foods. Suitable legislation should be passed regulating the sale of drugs, especially preparations containing cocaine, opium, or alcohol. Legislation—not too far in advance of public sentiment needed to enforce it—should be passed regulating the sale of alcoholic beverages. State registration of births, deaths, and cases of illness should be much more general and efficient than at present.

4. Municipal boards of health need to have more powers and greater appropriations; less political interference and better trained health officers; more support in public opinion. Their ordinances in regard to expectoration, notification of infectious disease, etc., should be better enforced by the police departments.

5. More legislation should be advocated, passed and enforced to the end that streets may be kept clean, garbage properly removed, sewage properly disposed of, air pollution of all kinds prevented, whether by smoke, street dust, noxious gases, or any other source. Noises also should be lessened.

6. School children should be medically inspected and school hygiene universally practised. This involves better protection against school epidemics, better ventilation, light, and cleanliness of the schoolroom, the discovery and correction of adenoids, eye strain, and nervous strain generally, and the provision for playgrounds. Sound scientific hygiene should be taught in all schools, public, private, normal and technical, as also in colleges and universities.

7. In industrial and commercial establishments, employers may greatly aid the health movement, and in many cases make their philanthropy self-supporting by providing social secretaries, lunch and rest rooms, physiological (generally shorter) hours of work, provision for innocent amusements, seats for women, etc.

Life insurance companies could properly and with much profit club together to instruct their risks in self-care and secure general legislation and enforcement of legislation in behalf of public health.

8. The present striking change in personal habits of living should be carried out to its logical conclusion until the health ideals and the ideals of athletic training shall become universal. This change involves a quiet revolution in habits of living, a more intelligent utilisation of one's environment, especially in regard to the condition of the air in our houses, the character of the clothes we wear, of the site and architecture of the dwelling with respect to sunlight, soil, ventilation, and sanitation, the

character of food, its cooking, the use of alcohol, tobacco, and, and last, but not least, sex hygiene in all its bearings.

9. The fight against disease will aid in the fight against pauperism and crime. It is also true that any measures which tend to eliminate poverty, vice, and crime will tend to improve sanitary conditions.

DISEASE, POVERTY, AND CRIME.

We have attempted to estimate in money the preventable wastes from disease and death. Although the figures for national losses strike the popular imagination, they have little significance; in fact, money estimates in this field, even when made on the per capita basis, are of little value except as emphasizing the overwhelming importance of human vitality compared with those interests which are usually measured in money. It is impossible in any true sense to measure human life in terms of dollars and cents.

The measure of life may perhaps be found in happiness, or the satisfactions enjoyed between birth and death, less the dissatisfactions.

Is life worth living? has been a much-asked question, especially since Mr. Mallock wrote a book with that title. The witticism sometimes given in answer, "That depends upon the liver," is true in both of its two meanings. A life of happiness is always worth living, and a life of usefulness, which brings happiness to others, is doubly worth living.

It is hardly necessary to recount all the conditions which tend to produce happiness. No one would question that the most fundamental condition of all is health, in spite of exceptional cases in which unhealthy people are found happy, and healthy people unhappy. It would be impossible to express in exact terms the extent to which improved health could increase human happiness; but every observer of human misery among the poor reports that disease plays the leading rôle. Students of criminology and vice agree that these are chiefly the result of morbid conditions and habits. Health reform brings in its train great and lasting reductions in poverty, criminality and vice.

We began this report by showing the relation between the conservation of health and the conservation of wealth. The broadest view of this relation is, as Emerson has said, that "Health is the first wealth," and as such it is treated by many economists.

Without enlarging or insisting upon this concept, it is obvious that by the conservation of health we may ultimately save billions of dollars of wasted values, and that this conservation is intimately related to conservation of all other kinds.

"In 1882 Robert Koch announced to the world his discovery of the tubercle bacillus. His paper on 'The Etiology of Tuberculosis' (probably the most far-reaching in its importance to the welfare of the human race of any original communication), based on experimental research, at once threw a flood of light on the darkest page in the history of medicine, a light which revealed the microscopic fungus which is the direct cause of tuberculosis, gave a new impulse and opened a new horizon to medical thought."—*Trudeau*.

"Consumption is of all diseases the most dangerous and fatal to the greatest number of mankind."
—Hippocrates, 400 B.C.

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"The State can spend no money to better advantage than in protecting the health of its citizens and preventing the spread of disease." *Governor Fort, New Jersey.*

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\$2 deposited each month amounts to -	24.38	49.52	129.56	279.82	891.96	2,769.70
\$5 deposited each month amounts to -	60.95	123.80	323.90	699.55	2,229.90	6,924.25
\$10 deposited each month amounts to -	121.93	247.58	647.88	1,399.13	4,459.88	13,848.52
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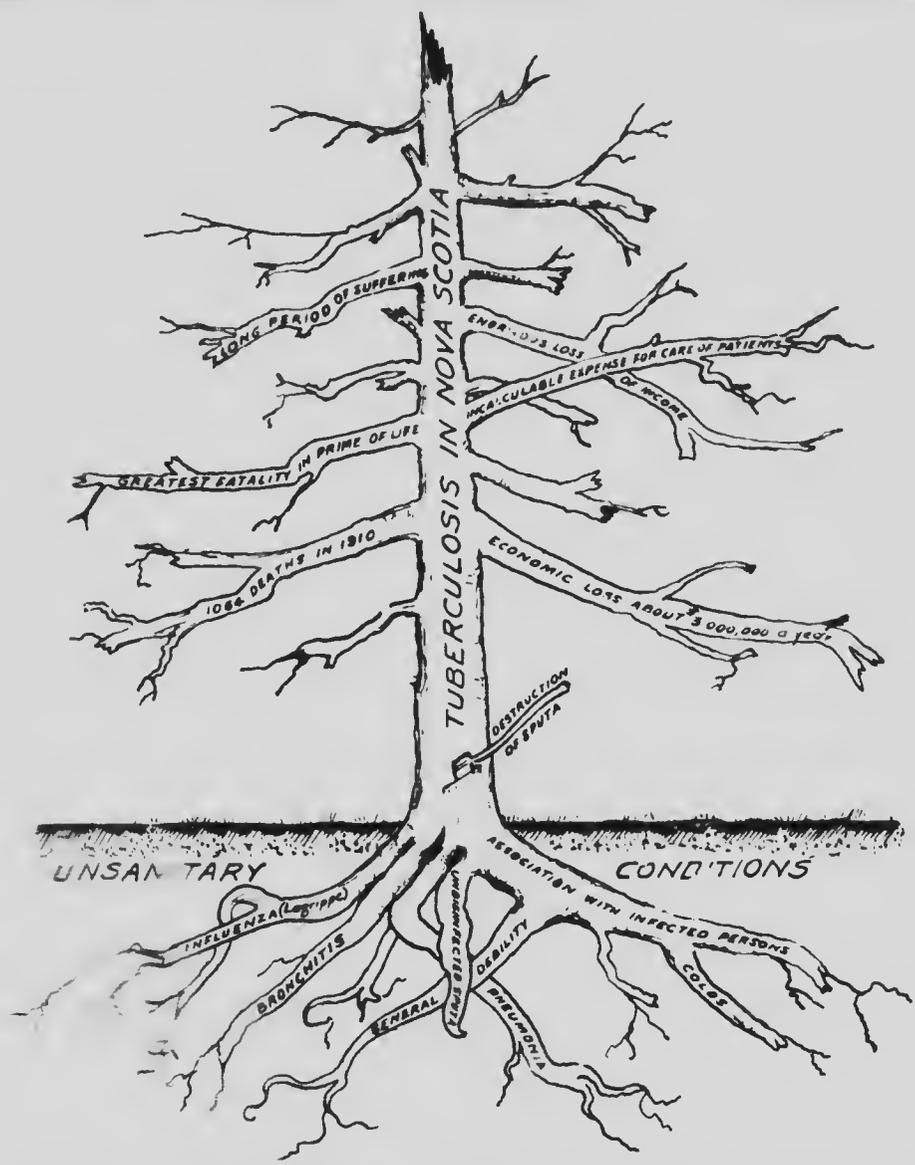
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It is an enormous waste of life and the sad low rate of population, or through some awful disease, that annually takes place on account of the spread of the white plague, that the most urgent measures should be adopted. It is only because we are accustomed to this waste of life that we make a habit of going about our business, paying no attention to this enormous death toll, and that the people are paying. — Justice Charles E. Hughes, U.S. Supreme Court.

"There is every reason to believe that, though tubercle bacilli may live for certain lengths of time outside of the animal body and may be cultivated on specially prepared media, they flourish only in the living body, and that if dissemination of the bacilli from diseased animals and human beings could be prevented the malady could be arrested."—*Maryland Tuberculosis Commission.*

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"Take care of the consumptive at the right time, in the right place, and in the right way, until he is well, and not at the wrong time, in the wrong place, and in the wrong way, until he is dead."—*Proyer*.

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TUBERCULOSIS MORTALITY

Chart showing the Death Rate from Tuberculosis in Ontario for 10 years.

Rate per 1,000 living.	YEARS										Rate per 1,000 living.
	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	
1.4											1.4
1.3											1.3
1.2											1.2
1.1											1.1
											Total
Deaths	3405	3484	3284	2694	2723	2877	2667	2911	2530	2511	29086

By courtesy of Dr. G. D. Porter.

"In the decade preceding 1899 there were no institutions for the tuberculous in the province; no dispensaries; no special visiting nurses; no educational agencies at work; no general information regarding the prevention of this disease. In 1899 there was only one institution, now (1910) there are twelve of them in the province and others projected, five dispensaries, and an increased number of visiting nurses, while a general campaign of education is being carried on."—DR. G. D. PORTER.

"Terrors of all sorts are unavoidably dissipated immediately knowledge and understanding are arrayed against them, and with the comprehension of these facts concerning consumption, one must lose his fear of the disease."—*Huber*.

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"Tuberculosis will be eradicated if we treat properly all those who suffer from the disease, and so interest them that they will not carry infection to others who are healthy."—*Dr. J. H. Elliott.*

"Hereditary consumption is so rare that, for practical purposes, it may be regarded as non-existent."
—Dr. Koch.



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Eureka Underwear is made of **all** Nova Scotia Wool. This Wool is the best for making cold weather underwear. Why? Because the sheep live on a Peninsula, which is almost an island, receive the benefits of the bracing ocean air, ideal climate, and feed on rich grazing land. This gives an elasticity, silkiness and strength to the wool, a combination that makes the softness and strength so much desired in wool used in making underwear.

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If your dealer does not carry Eureka Underwear send us his name

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"Consumption is the saddest thing in the world and is largely unnecessary."—Pryor.

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Dr. Koch.

"Our national health is, physically, our greatest national asset."—Roosevelt



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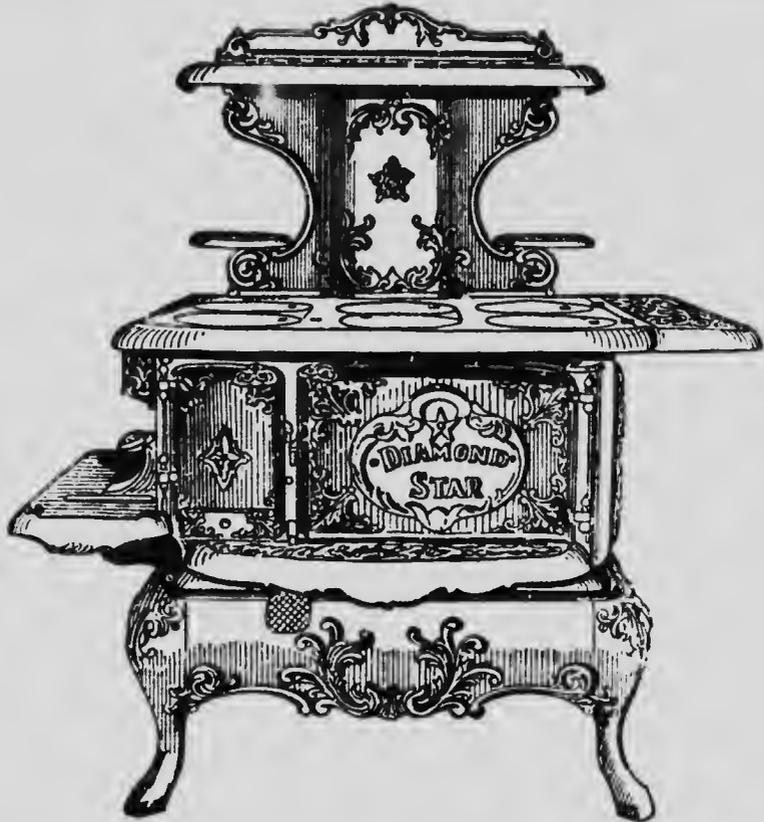
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The Object of the Company

is to save to its members the profits that would otherwise go to the ordinary dealer, by buying goods at wholesale prices and selling to themselves at ordinary rates and dividing the profits of the business among themselves every half-year.

What the application of this principle means is illustrated by the following facts.

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The Members paid into the business in Cash on Capital Account	-	\$12,077.33
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Total Savings	-	\$36,448.71
Paid Back to Members	-	\$25,279.71
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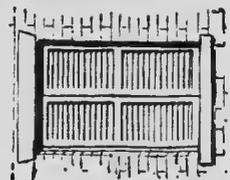
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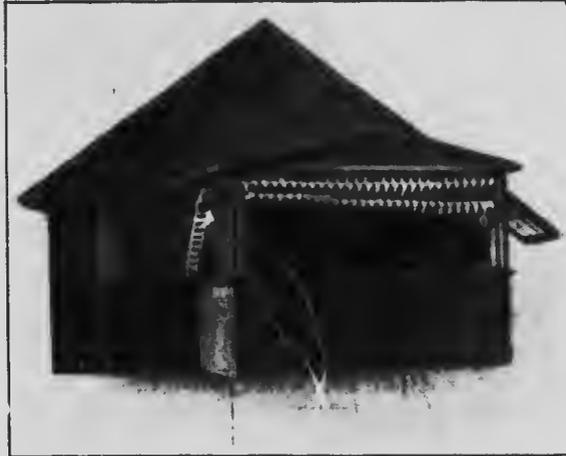
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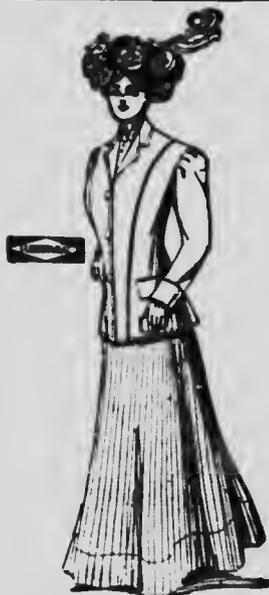
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CABINET-MAKING IN THE OPEN-AIR SHOP AT THE ADIRONDACK COTTAGE SANATORIUM.

"The tubercle bacillus is found as a rule, only in places in which an uncleanly consumptive maintains himself; otherwise it occurs but rarely."—*C. net.*

"Every person is exposed to the danger of taking up germs of tuberculosis into his own system, and many harbour them a long time without knowing it. Every one must therefore be prepared to battle with this enemy"—*Imperial Board of Health, Germany.*

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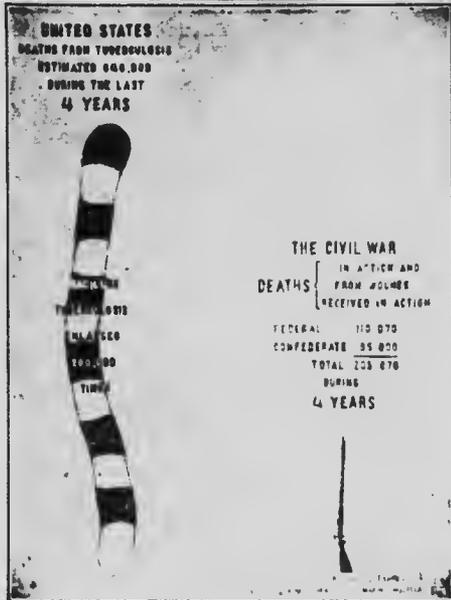
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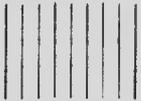
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5. Rest while there is fever.
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