

## Address.

### THE ANTI-TUBERCULOSIS PROGRAM: CO-ORDINATION OF PREVENTIVE MEASURES.

BEING A LECTURE DELIVERED, ON THE INVITATION OF THE COMMITTEE, BEFORE THE INTERNATIONAL CONGRESS ON TUBERCULOSIS AT WASHINGTON, D. C., SEPT. 21 TO OCT. 12, 1908.

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THE anti-tuberculous crusade is a world movement of first importance. Although of recent origin, it has already attained striking proportions. It is a fine expression of the large humanitarian outlook of modern life. This great international congress affords remarkable illustration of the wide interest which has been awakened.

Nevertheless, the movement can hardly yet rank as an effective campaign against tuberculosis save in a few centers. Speaking on American soil, it is my privilege to recognize that nowhere has a more thorough plan of action been instituted than in the city of New York.

#### BEFORE THE TUBERCLE BACILLUS: SANITARY LEGISLATION.

The work achieved by the nations severally, of which the international congress is the formal register, has been overtaken in chief part during the past ten years. Prior to that, however, much had been accomplished. Before the discovery of the tubercle bacillus a warfare of less direct nature, but still a successful warfare, had been carried on. The methods of that warfare have been maintained in more recent times and must constitute an essential feature in the further movement. The recognition of physiological principles and the institution and enforcement of sanitary measures, with consequent improvement of individual environment, have proved of incalculable service. The legislation of the past three quarters of a century with regard to the dwellings of the poor, lodging-houses, workshops, factories and other public-health enactments have paved the way for the more direct attack. Through the influence of these measures, mortality from tuberculous diseases has as steadily lessened as that from other infective conditions. It is in large part due to the efficacy of such legislation that England has continued for long to yield the lowest death-rate from tuberculosis. The progressive decline in the death-rate during the pre-bacillus period thus finds definite and sufficient explanation.

There can be no doubt that the housing question, using that phrase to include all considerations relating to dwellings, lodging-houses, schools, workshops, factories, offices, etc., must occupy a chief place in the preventive program against tuberculosis.

The attitude of certain countries, notably Italy, France and Spain, towards tuberculosis in still earlier times is of historical interest, and, so far as these countries are concerned, has probably been of permanent value. Let me remind you

that, towards the end of the eighteenth century, these countries regarded tuberculosis as a condition to be dealt with by special legislative enactment. For our present purpose it is sufficient to recall that a system of compulsory notification was in vogue, and heavy penalties were attached to breach of the statutes relative to precautionary measures to be taken in tuberculous cases.

#### ENTER THE TUBERCLE BACILLUS.

In spite of a growing belief among advanced thinkers that tuberculosis was communicable, it took the world by surprise when the announcement was definitely made that the tubercle bacillus was the effective cause. The incontrovertible fact had little immediate effect in relation to treatment. It was difficult for the existing generation to interpret its bearings. A glance through the literature of medicine during succeeding years recalls in striking fashion the tremendous work which was necessary before the bacillus was accepted practically as the cause of consumption and other tuberculous disease. The retrospect reveals an almost endless procession of researches regarding the bacillus, its life history, its toxic influence, its effect on the tissues of its host, the histology of the induced processes, the significance of constitutional symptoms and the cause of death from tuberculosis.

With more exact knowledge, clearer views were possible as to the connection of a previously ill-defined group of diseases. The vagueness of older conceptions was replaced by clearness and unity of view. It became evident that heredity, which had hitherto played so large a part in the conception, meant chiefly greater liability of tissue, to which fell to be added risk of infection by environment.

There was speedily forthcoming from all parts of the world abundant evidence of the universality of the disease and the overwhelming disaster it induced. For the first time the tremendous mortality from tuberculosis seemed to be realized.

#### ANTI-TUBERCULOSIS EFFORT.

Efforts now began to be made to cope with the evil. Here and there institutions and agencies were founded for the relief of tuberculous patients. Gradually in most countries of the world there sprang up anti-tuberculosis societies. The work of these has increased from year to year, and their influence has been considerable as regards prevention and treatment. They have helped greatly to awaken interest and direct public opinion. The labors of various national societies have been fruitful and far-reaching. In recurring international congresses and conferences, the opinion of representatives from all the nations has been focused, with the result that the movement has advanced more or less consistently throughout the world.

Reviewing the situation at the present moment, our feeling is one of admiration at the progress which has been made. In what may be said subsequently, I trust it will not be supposed that I am belittling the really splendid work which has

been accomplished. I have kept myself in close touch with the development of the movement throughout its entire course, and venture to say that no one appreciates more thoroughly the difficulties which had to be met and the excellence of the work.

#### INSUFFICIENCY OF MOVEMENT.

None the less, it has been my conviction for a number of years that the movement has tended to proceed on less effective lines than it might, that there has occurred an unnecessary dissipation of effort, and that consequently the net result has been less than it should have been. This misdirection and waste of energy seem to me traceable in chief part to insufficient realization of what is required and the lack of efficient organization and co-ordination of measures.

#### VASTNESS OF THE PROBLEM.

In seeking for a solution of the vast problem, the first desideratum is a just conception of its nature and extent.

We start from the premises (a) that tuberculosis is an infective condition; and (b) that it is in large part the expression of faulty social conditions.

#### TUBERCULOSIS AN INFECTIVE CONDITION.

As an infective condition, it must be attacked in accordance with the principles which have been found applicable in the prevention of other specific fevers. These principles apply to tuberculosis no less than to enteric fever.

But the prevention and treatment of tuberculosis present a more complicated problem. Tuberculosis has certain aspects all its own. More especially it is peculiar in respect of the diversity of its clinical manifestations and its varying duration. On this account the scheme of prophylactic measures available for other infective processes requires adaptation and enlargement. While, for example, there is a stage in its course when, in the interest of unaffected persons, cases of pulmonary tuberculosis, occurring in the contracted dwellings of the poor, should be removed to hospital, it would be manifestly out of the question to propose the segregation at all.

#### INCIDENCE OF TUBERCULOSIS.

A word or two seems desirable as to the extent of ground to be overtaken. I am convinced that most calculations as to the incidence of tuberculosis have erred on the small side. Consideration has been confined generally to ascertained mortality in different countries. This has limited the issue unduly. The subject is particularly one where the statistician's figures require amplification at the hands of the clinician. I have made various calculations and have elsewhere stated that a reasonable basis for estimating the incidence of tuberculosis in any district, that is, in forms requiring attention, may be obtained by multiplying the recorded mortality from tuberculosis by 10. I am satisfied that this figure will be found to understate the actual fact. I believe

it might be doubled without exaggeration. Time will not permit me to enter into details here. The main point to be kept in mind is that death-rates from tuberculosis represent very insufficiently the amount of tuberculosis requiring consideration from the preventive point of view.

Passing from this, may I recall to your minds the extremely varying clinical history and duration of ordinary consumption? There are cases which run an acute course in a few weeks. There are cases which may last twenty years or more. Between these two extremes there is an infinite variety. There are cases of slight, early, tuberculous infiltration. These, whether latent or progressive, may have no discharge whatever. At the other extreme, there are cases of advanced tuberculosis, commonly accompanied by abundant expectoration. Broadly, we have to separate between cases of "open" tuberculosis in which bacillus-containing expectoration is present, and cases of "closed" tuberculosis without such discharge. A distinction must be drawn between cases where the process, however extensive, remains for the most part local, and cases where the local process, whether slight or pronounced, is associated with much constitutional prejudice. We have further to separate between cases occurring in persons brought into contact with others through the exigencies of residence, work or other conditions, and those occurring in persons who lead a relatively isolated existence.

#### AN INTRICATE SOCIAL PROBLEM.

While these examples serve to illustrate the great variety of manifestation, they indicate most inadequately the actual intricacy of the problem. The essential dependence of the occurrence and spread of tuberculosis on prevailing conditions of social life is but partially revealed.

Tuberculosis permeates human society as does no other malady. It is one of the tolls levied on mankind because of his social habits, and society suffers through its ravages no less than the individual. It is the expression of an incomplete civilization. The social faults, of which it is the register, are, especially, deficient aëration and overcrowding. The recognition of this fact is evidenced in the measures which science and clinical experience combine to enjoin in the treatment of patients. Under conditions of hyper-aëration, the consumptive patient, even if gravely ill, frequently recovers. Yet how difficult it seems to attain for prophylaxis what we strain every effort to follow as a therapeutic procedure!

#### TUBERCULOSIS IN INFANTS.

The individual, from the moment he becomes a social unit, is opposed by a procession of prejudicial influences which make for tuberculosis. The room in which he is born and reared is commonly insalubrious. This seems evident when he is one of a family of six or eight in one or two rooms. The nursery is no less a factor to be reckoned with in the dwellings of the well-to-do and rich.

To the common disregard of sufficient aëration

add the presence, in many instance, of actual infection within the home, either because of the presence of one or more infected individuals or because the house itself is infected. To this there must frequently be added the influence of malnutrition from improper feeding, and the possibility of infection from contaminated milk and other food supply. What a handicap is thus assigned to the individual at his entry into the social circle!

I am convinced that it is at this point that the tax is commonly levied, even if exaction of payment comes later. Every day I am more impressed with the frequency of tuberculosis lesions in infants and young children. I refer not so much to pronounced cases of pulmonary or abdominal tuberculosis, but rather to slighter manifestations which often escape notice, such as glandular infiltration in the cervical and supra-clavicular regions, associated with minor degrees of pulmonary involvement.

Without entering on the vexed question of the channel of infection, a large mass of observations lead me to the conclusion that infection may occur by way of the mucous passages at any point from the oral and nasal orifices downwards. The two essential factors are devitalization of the mucous membranes and the presence of the infective organism.

While statistics of mortality in childhood emphasize the frequency of disease at this stage, there is reason to believe that infection is far more common than the death-rate would indicate. The disease lies latent—it may be, sealed in glands or limited elsewhere by cicatricial tissue—for long periods until a fresh disturbing cause re-excites to activity.

Once more, the exciting cause is usually social in origin. Perhaps it is the outbreak of measles, whooping cough or other epidemic infection. In a large number of cases it is to be found in the insanitary conditions of school life, where insufficient aëration is common, accompanied oftentimes by immediate risk of infection through tuberculosis present in children or teachers, or clinging to the schoolroom itself.

#### TUBERCULOSIS AMONG SCHOOL CHILDREN.

As to the occurrence of tuberculosis in school children, my observations and views differ from those of some observers. I am satisfied that tuberculosis at this age is vastly more frequent than is usually supposed. This belief is based on two separate series of observations. Without entering into details, I may give a résumé of the facts.

The first series has reference to the frequency with which school children have presented themselves at the Royal Victoria Dispensary for Consumption, Edinburgh. Thus, out of a total of 16,589 consecutive cases, no fewer than 1,917 were in children below fifteen years of age, that is, 11.5%.

The second series of observation includes my personal examination of groups of children in various schools under the School Board in the

city of Edinburgh. The groups of children were selected at random by head masters as representative of different ages, and strictly without any reference to supposed delicacy or otherwise. In judging the cases I made use of three simple definite tests. In every case the tests were applied by myself, and the results carefully noted by a colleague. The tests included: (a) Palpation, for evidence of glandular enlargement in the cervical and supra-clavicular triangle. Only cases showing at least a dozen such enlarged glands were included as positive. (b) Percussion of the apices. (c) Auscultation of the apices. In the final determination, I regarded as tuberculous only those children who afforded positive evidence in respect to each of the three tests. In every case, and in relation to each of the tests, if there was doubt, I gave the child the benefit of the doubt. As a further correction, to exclude the possibility of error and over-refinement in diagnosis, I wrote off 15% of the whole. The net result is that no fewer than 30% of the children examined were found to present stigmata of tuberculosis.

Of immense significance in this connection is the large increase of mortality which occurs during the period of school life. Thus, taking the mortality from pulmonary tuberculosis in Scotland during three successive quinquennia from 1891 to 1905, I find that while there is a remarkable decrease in the rate as between children under one year and children under five years, amounting to 31.08% (1891–95), 29.03% (1896–1900), and 15.38% (1901–05), and while there is likewise a decrease in mortality between the ages of five and nine, amounting to 17.65% (1891–95), 25% (1896–1900), and 26.81% (1901–05), there is contrariwise a most striking increase in the death-rate of children from ten to fourteen years of age, the increase amounting in the respective periods to 90.48% (1891–95), 105.88% (1896–1900), and 90.63% (1901–05).

Unhappily, further analysis of mortality statistics raises a doubt as to whether the conditions of school life have improved *pari passu* with other sanitary progress during the fifteen years referred to (1891–1905). I find in respect of tuberculosis other than phthisis, for all children under fifteen there has occurred a slight increase of mortality during the fifteen years (1891–1905); amounting to .63%. There has been under one year of age a marked decrease of mortality during the same period. For children from one to four years there has been a slight increase of mortality, and for children between five and nine a decided increase, amounting to 8.75%, and for children from ten to fourteen years a much greater increase, amounting to 17.39%.

#### TUBERCULOSIS AT WORKING AGES.

What I have said of the conditions of school life applies also to conditions of industrial and business life. Here again the individual meets adverse influences in the sense of insufficient aëration, overcrowding, contaminated atmosphere, and the possibility of direct infection either from fellow-workers or from the workroom itself.

At this stage the social damage becomes more apparent. The facts yielded by mortality statistics with reference to this age are sufficiently well known and bear striking witness to the influence of social conditions. The progress of disease, which now attains its maximum, entails physical weakness and inability for work. This in turn leads to financial embarrassment and gradually increasing want, both on the part of the individual and those dependent on him. With increasing poverty, the conditions of home life become still more unfavorable both to the patient and to the other members of his household. A predisposition is effected throughout the household, and the presence of infective material establishes a vicious circle of ever-widening circumference. Certain houses tend to become veritable nests of disease.

#### TUBERCULOUS NESTS.

Striking evidence in this connection is afforded by an analysis of the conditions of residence obtained by domiciliary visits paid to patients who have presented themselves for treatment at the Royal Victoria Dispensary for Consumption, Edinburgh, during the past twenty years. Thus it has been found that it is quite common for case after case to recur in different families occupying successively the same dwelling, flat or tenement. I might cite many examples of this. For the present purpose it may be sufficient to quote the following:

(1) In one street of 22 houses, one dwelling, consisting of 4 flats, shows a record of no fewer than 32 separate cases of consumption in 15 different families. Quite recently, within the past few months, a newly married couple flitted to this tuberculous nest. In due course both husband and wife have developed grave manifestations of disease.

2. From one short street of 15 houses are recorded 54 cases. It is of special interest to note that, while these cases are pretty uniformly distributed among 14 of the houses, one house has actually yielded as many as 18 cases.

Apart from such glaring examples, it is not at all uncommon to find that as many as ten or twelve cases have been received from one particular house. An interesting observation emerges in connection with some of these, that the worst nests occur more commonly in streets of the *cul-de-sac* type. It may similarly be noted that in certain streets formerly of a better class, where now the sunk areas are largely occupied by working-class families, every such dwelling has provided one or several cases of consumption. In relation to the common lodging-houses of the city, hardly a month passes without a case presenting itself from certain of these.

The records of the Royal Victoria Dispensary have brought to light other extraordinary facts regarding home conditions of the tuberculous poor. Thus in respect of frequency of infection, they go to show that in 61.4 per cent of the cases there existed all the possibility for infection, that is to say, the patient had been for a pro-

longed period in closest proximity to, at least, one case of advanced tuberculosis. In other 11.7 per cent, direct infection seemed probable. In 26.9 per cent only did we fail to trace definite risk of infection.

An analysis of the sleeping arrangements of the tuberculous patients yields evidence of most disquieting nature. Thus it was found that in as many as 65.9% of the cases, the patient occupied the same bed with one or several persons, and in 11% more occupied the same room. When the patient slept alone, it was commonly in a bed-closet, little larger than an ordinary press.

An analysis of the number of rooms in the dwelling houses of patients emphasizes in remarkable fashion the close dependence of tuberculosis on overcrowding. Thus it was found that —

16.7%	of the cases occupied dwellings of 1 room only.
47.0%	" " " 2 rooms.
23.8%	" " " 3 " "

Out of 1 000 consecutive cases of tuberculosis, the dwelling houses in 167 instances consisted of one room only, which was commonly shared by numerous persons, several of whom were infected at the same time.

Thus, of 167 one-roomed dwellings containing tuberculous patients —

3 were occupied by 8 persons each.			
3	"	8	"
7	"	6	"
11	"	5	"
31	"	4	"
48	"	3	"
46	"	2	"
18	"	1	"

#### A PROBLEM FOR COMMUNITIES.

My purpose so far has been to show the extensive distribution of tuberculous disease, its extremely varied manifestations, its dependence on our social system and its vast ramifications.

In view of the facts, the question arises whether as communities we have adequately recognized the complex relation of cause and effect which link us to the tuberculosis problem. Have we recognized the need in self-interest — putting for the time humanitarian considerations in the background — of meeting the issue in systematic statesmanlike fashion?

As we have seen, there are indications that in most parts of the civilized world attention has been aroused. Much thought has been given to the subject, and excellent work has been done. None the less, I am firmly convinced that most existing movements fall utterly short in respect of necessary completeness and organization.

#### THE INDIVIDUAL VERSUS THE COMMUNITY.

I believe the cause of failure is to be found in the determination of effort too largely towards the individual patient rather than towards the disease as a social malady. The greater need is often missed.

The problem before us is not, How best to

recover a certain number of sick persons and render them fit to resume work and make bread and butter once more. For the eradication of so widespread a disease, with ramifications throughout the entire social system, the outlook is much more extensive.

While the individual patient must ever command attention and pity, and his interests not be overlooked, such interests must be allowed to assume proper proportion in the larger horizon. The problem rather is, Given a disease which, speaking broadly, is responsible directly for one seventh of the mortality of the civilized world, and indirectly for an incalculable amount of physical and economic waste,—a disease which has been proved of infective nature and which is propagated widely by environment and other social influences,—how are we to limit its spread and finally cause its eradication?

If the issue be fairly looked at, the futility of much existing endeavor becomes apparent. It is not so much that the endeavor itself is wrong, but rather that it is inadequate, indeed, utterly disproportionate, to the need. There is an absence of concerted effort to meet the larger issue.

Take, for example, the sanatorium. From one point of view the significance of the sanatorium can hardly be over-estimated. But the sanatorium is concerned only with a small corner of the field. I ventured to emphasize this view several years ago. It seemed to me that in not a few instances the conception of founding sanatoriums had been allowed to bulk too largely in anti-tuberculosis movements. The public were being led to expect too much from sanatorium régime, in respect both of individual cures and of the extinction of the disease. As the results of sanatorium treatment accumulated, and as these were found less uniformly good than the hopefulness of the over-sanguine had expected, there had begun to be manifested a feeling of vexation and almost of annoyance.

The view that the curative results of sanatorium treatment have been disappointing has been pressed strongly in published statements in different countries. This is unfortunate. To those who are familiar with the results of sanatorium treatment, any attempt to submit evidence in their favor would seem superfluous. The sanatorium admittedly constitutes an important division of the work. Still the outlook of the sanatorium is limited. Its efforts are directed chiefly towards the recovery of a certain proportion of early cases.

#### A COMPREHENSIVE PROGRAM.

For the eradication of tuberculosis — and it is to this that the efforts of communities must be directed — a more comprehensive program is necessary. A thoroughly organized plan of operations is required, with co-ordination of measures in respect of the different aspects to be faced. There is much to be said for uniformity of action throughout the country, and, so far as varying conditions will allow, throughout the world.

In enumerating the several factors in such a scheme I propose to dwell with greater detail on the present occasion on one of these, namely, the dispensary, because it was particularly with reference to this that the committee of the International Congress honored me with the invitation to address the Congress.

#### NOTIFICATION.

By way of preface, let me say that, in order to achieve success, our information regarding the extent, distribution and characters of tuberculosis in a given district must be as complete as possible. There must be an intelligence department, and the department must be efficiently manned. Having regard to the ultimate purpose of the campaign, I confess to an entire failure to understand the validity of objections which have been and are still urged against notification. It seems pre-eminently desirable that responsible authorities should be placed in possession of the facts, in order that they may conceive and frame adequate measures to meet the need. Most arguments against compulsory notification appear to me to err, in respect that they place the supposed interests of the individual in antagonism to the interests of the community. I say advisedly the "supposed" interests of the individual, for it is difficult to conceive that there can be antagonism between his interests and those of the community.

Let it be kept clearly in view that the formal intimation made to the authorities under any scheme of notification is privileged and confidential, that it is for the information of the authorities and that, in a great many instances, it need not be followed by further action of any kind.

In these circumstances I cannot realize how disadvantage can follow the procedure so far as the individual patient is concerned. On the contrary, notification is in the interest of the individual no less than in that of the community. It is only by accumulation of facts of the varying kind I have cited regarding the social influences which lead to tuberculosis that we can hope to enlist the help of the state, municipalities and other local authorities in favor of the consumptive.

The difficulties which have been raised have been largely of a *a priori* character. Similar objections were advanced in connection with the notification of the acuter processes. Even were the objections of practical import, their significance is slight and temporary as contrasted with the vastness of the chronic evil we have to face.

Moreover, there is ample evidence that such objections melt rapidly away when compulsory notification is introduced. I may cite in illustration the experience of New York, Norway, Sheffield and Edinburgh.

In case of New York, as is well known, notification was required in 1893 of cases of consumption in all public institutions, and was requested voluntarily from doctors of cases occurring in their private practice. This partial and tentative

measure was followed in 1897 by the official declaration by the Health Board of New York that pulmonary tuberculosis was an infectious and communicable disease, and notification of all cases of consumption was made compulsory. Compulsory notification has been enforced successfully during eleven years in one of the largest cities of the world. There is similar evidence available from many other cities of the United States. In Norway, compulsory notification has been carried out for several years without a hitch. Sheffield has had satisfactory experience of compulsory notification for four years. Edinburgh, after trial of voluntary notification since 1903, introduced compulsory notification on March 1, 1907, and no practical difficulty has occurred in connection with its operation.

In the case of Scotland, uniform procedure has been rendered possible by the official pronouncement of the Local Government Board for Scotland, in a circular dated March 10, 1906, that pulmonary phthisis is an infectious disease within the meaning of the Public Health (Scotland) Act, 1897, and that notification is necessary if the Public Health Act is to be applied effectively to pulmonary tuberculosis. Since the issue of that circular, nine local authorities have applied for the board's sanction to their adoption of compulsory notification.

#### AFTER NOTIFICATION ?

Notification is not, however, everything. Some of its warm advocates would seem to have run away with the notion that notification is tantamount to extinction of tuberculosis, or, at least, that its adoption concludes responsibility. Contrariwise, notification constitutes the introduction only to effective procedure.

The practical import of the immensely varying manifestations of tuberculosis now becomes apparent. Tuberculosis differs from all other notifiable diseases.

In respect of acute fevers, notification is comparatively simple, both in fact and consequences. The epidemic outbreak is commonly limited, the symptoms evident and the illness rapid and short. Procedure following notification is accordingly simple and routine. The patient is either removed at once to an infectious hospital, or, if the medical attendant be satisfied that this is unnecessary, may be treated at home. Disinfection is readily achieved, whether the patient be removed to hospital or be treated at home. The incident is complete in a period varying from a fortnight to six or eight weeks.

It is different in tuberculosis. Cases are often not detected until long after infection has occurred. The symptoms of disease may be hardly noticeable at first or may be misinterpreted. The diagnosis is frequently enough missed. Even when shortest, the duration of the illness is prolonged. Special difficulties present themselves among the poorer classes, who may have no doctor or who do not think of consulting until something serious presents itself. Really the greatest practical difficulty in connection with notification

of tuberculosis is to achieve it sufficiently early.

This will always prove a weakness of any scheme in which notification stands alone, that is, apart from an organized system for the treatment and relief of tuberculous patients at their own homes as well as in one or other type of hospital.

It is at this point that the significance of the dispensary becomes apparent.

#### IDEAL OF THE DISPENSARY.

Admitting that tuberculosis is commonly dependent on environment and other social influences, and that it is frequently a house infection, it must be our aim not merely to treat individual patients, but to trace them to their homes, to get at the tuberculous nests, to clear these out, and so prevent further spread.

This means a careful system of domiciliary visitation and investigation. Twenty years' observation has convinced me that, in the solution of the tuberculosis problem, a system of supervised home relief must play a chief part. This view was first forced on me from experience of the total inadequacy of ordinary hospitals to deal with the larger aspects of tuberculosis. This it was which led me, in 1887, to propose the institution of the Victoria Dispensary for Consumption in Edinburgh. The purpose was to erect a central institution which should concern itself in every possible way with the treatment and relief of the tuberculous poor, and to which persons of this class, suffering from colds or chronic ill-health, should be directed.

During these years it has been my lot both to organize and to be kept informed regarding the detailed operations of the dispensary. I am satisfied that the program as then proposed has been entirely justified by the results achieved.

The functions of the first tuberculosis dispensary were extensive, much more extensive than is suggested by the program proposed by certain more recent dispensaries.

The dispensary, as I conceive it, should be the center of all anti-tuberculosis endeavor within the given district. It should constitute at once the information-bureau, the "clearing-house," in respect of all sorts of tuberculous material, and the center of supervision and treatment of such patients as may safely be treated at their own homes. It should be the connecting link or *nodus* of the entire system of anti-tuberculosis operations.

While far from disparaging the excellent work which has been achieved by the numerous tuberculosis dispensaries which have latterly sprung up in different countries, I should like to emphasize that a dispensary must remain of relatively little value when it stands alone. In such circumstances it may afford relief of various kinds to a considerable number of individual patients, but it fails to be of larger import from lack of the wider outlook in relation to a general scheme of operations. While the treatment of individual patients is a necessary and gratifying incident, the purpose of the dispensary is a still larger one.

## DISPENSARY AND NOTIFICATION.

Thus, in relation to notification, the dispensary plays a twofold part. In the first place, it will prove a most important notification agency. The tuberculosis dispensary draws to itself tuberculous patients of the poorer classes at all stages of the disease who would, in many cases, either not consult at all, or might present themselves for advice under conditions where the recognition of the disease is less readily achieved. By coming to a recognized dispensary for consumption, these patients in reality notify themselves. This is of immense importance in places where a system of compulsory notification may not be in force. The dispensary is no less serviceable in presence of compulsory notification. As illustration of this, I may mention that, of all the cases notified during the first year of compulsory notification in Edinburgh, approximately 50% were notified by the Victoria Dispensary for Consumption.

In the second place, the dispensary serves a most important purpose after notification. It helps, as no other agency can, to answer the question, What is to become of the notified individual? I have compared its activity at this point to that of a "clearing-house," where the different types and groups of tuberculous disease are dealt with systematically. The dispensary forms thus, at one and the same time, a collection-bureau and distribution-bureau.

## THE DISPENSARY MUST NOT STAND ALONE.

For this reason the dispensary cannot afford to be an isolated institution. Its strength and success will depend, first, on the thoroughness of its internal organization, and, second, on the closeness of its relationships with other institutions concerned in the prevention and treatment of tuberculosis. Its methods must be simple, direct and businesslike. It need not be an expensive concern. What is chiefly required is a thorough grasp by those in charge of the dispensary of its purposes and far-reaching possibilities.

## THE DISPENSARY PROGRAM.

As illustration of the ground to be covered, I may cite the program of the Victoria Dispensary for Consumption, which was founded in 1887. It includes:

1. The reception and examination of patients at the dispensary, the keeping a record of every case, with an account of the patient's illness, history, surroundings and present condition, the record being added to on each subsequent visit.

2. The bacteriological examination of expectoration and other discharges.

3. The instruction of patients how to treat themselves, and how to prevent or minimize the risk of infection to others.

4. The dispensing of necessary medicines, sputum bottles, disinfectants and, where the patients' conditions seem to warrant it, foodstuffs and the like.

5. The visitation of patients at their own homes by (1) a qualified medical man, and (2) a specially trained nurse, for the double purpose (a) of treatment and (b) of investigation into the state of the dwelling and general conditions of life and the risk of infection to others.

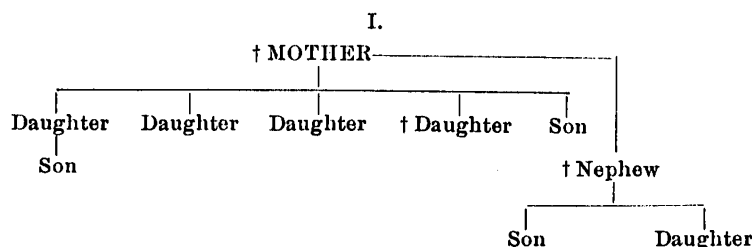
6. The selection of more likely patients for hospital treatment, either of early cases for sanatoriums or of late cases for incurable homes, and the supervision, when necessary, of patients after discharge from hospital.

7. The guidance generally of tuberculous patients and their friends, and for inquiries from all interested persons on every question concerning tuberculosis.

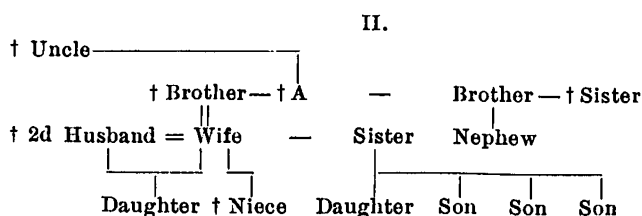
I may add that, while the experience of twenty years has led to modifications and extension of details, no essential change has been found necessary in the program.

## DOMICILIARY INVESTIGATION.

It must be sufficiently evident what a direct part the dispensary plays in the investigation and supervision of tuberculous patients at their own homes, where, from the nature of the case, a



Total, 10 Cases.



Total, 15 Cases.



large proportion of the patients must continue to be treated. Because of the essentially chronic nature of the disease, the dispensary will replace the hospital in the case of many patients.

By means of the domiciliary visits paid by the doctor and nurse, detailed information is accumulated regarding the conditions of the home, the patient's environment, and generally the health conditions of the household.

Particular attention is paid to other members of the family. They are invited to submit themselves for examination either at home or at the dispensary. The value of this proceeding can hardly be overestimated. The wide distribution and ramifications of tuberculosis are thus amply realized.

I might multiply examples in illustration, but those cited will serve our purpose. In each instance the primary patient is indicated by darker type, while secondary patients, that is, those who came under the direction of the dispensary as results of domiciliary visits, are shown in ordinary type. A cross indicates that the patient in question was cared for by the institution up till death.

Systematic visitation has also brought to light the great frequency with which the tuberculous patient, for one reason or another,— often from pecuniary considerations,— changes his residence. Thus, in the clientèle of the Victoria Dispensary, it was found that no fewer than 41% of the patients had changed residence within two years, thus multiplying infected areas.

#### OTHER RELATIONSHIPS.

The dispensary is in intimate relationship with the sanatorium for the cure of selected cases. It chooses for this purpose from its extensive clientèle such patients as are likely to do well, and who require and deserve help. The dispensary also concerns itself, when necessary, with the after-care of patients discharged from the sanatorium.

The dispensary is, further, in close touch with hospitals, municipal or other, which afford provision for advanced, incurable cases, with a view to their segregation. The erection of such isolation hospitals is urgently called for as a factor in the campaign. The Local Government Board of Scotland has concluded that the isolation of such dangerous cases is a primary duty of the local authority.

The dispensary occupies itself likewise with the selection of suitable employment of light, open-air nature for consumptive patients who may not require hospital treatment. This is a valuable department of activity. Many families have, in my experience, been thus saved from destitution. School children affected by tuberculosis are similarly watched over and removed from school in their own interest and that of others, and their education supervised on physiological lines.

Moreover, the dispensary has connections with other hospitals and charitable institutions for the double purpose of giving information

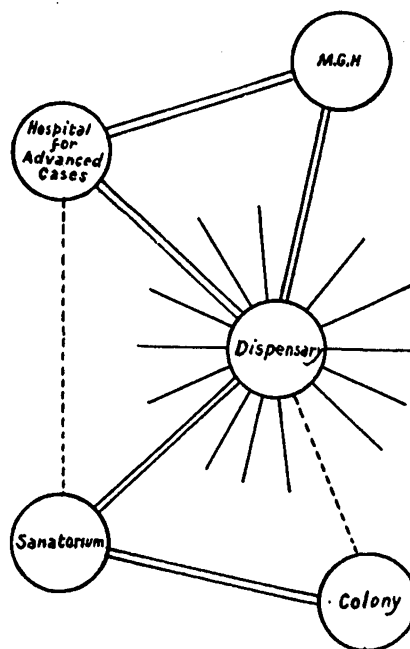
and advice regarding patients who may be in such institutions for whom other arrangements may be necessary, and of drafting to such institutions suitable cases from outside.

The dispensary comes to fulfill an important function in case of financial distress which is often present. Families and dependents of patients are, through the agency of the dispensary, not only safeguarded in respect of their health, but, when the chief wage-earner is affected, are brought into touch with one or other charitable fund. Inquiry is directed to such points by the nurse and members of the Samaritan committee.

The dispensary, in this way, forms the connecting link between all agencies concerned in any way with the treatment or relief of the tuberculous poor.

#### CO-ORDINATION OF MEASURES.

Rehearsing for a minute or two the points which have been considered, my conception of a working scheme for the prevention and treatment of tuberculosis in an urban district will be readily understood by reference to the accompanying sketch, which actually represents the plan of operations now conducted in the city



of Edinburgh. It shows the dispensary as the center of inquiry and guidance in all matters concerning tuberculosis. It shows the relationship of the dispensary to the public health service (M. G. H.), of which it forms in many ways an important instrument. It shows the dispensary's relationship to the hospital for advanced and dying cases on the one hand, and, on the other, to the sanatorium for early cases, with the extension of the sanatorium in the colony for convalescent patients.

With comparatively slight modification, the



scheme is realizable in country districts equally well.

The Local Government Board for Scotland have adopted the scheme which has been elaborated at Edinburgh as a national system for the administration of the campaign against tuberculosis in Scotland.

#### SOCIAL PROGRAM OF MUTUAL EFFORT.

To sum up, we have seen the essentially social character of the tuberculosis problem. We have seen how social habits and faults are responsible for the occurrence and spread of the disease. We have seen how the individual suffers because of his social environment and how society suffers in turn because of the tuberculous individual. From all this it is clear that society has a double duty, that is, a duty both to the individual and to itself.

How are we to apportion and deal with the several aspects of responsibility?

#### OFFICIAL AND PHILANTHROPIC CO-OPERATION.

It is sufficiently evident that a vast field exists for anti-tuberculosis endeavor. There is abundant room alike for official and for philanthropic effort. If it is to be effective, it is essential that the efforts be organized and harmonious.

The official outlook — that of the state, municipalities and other local authorities — is specially towards prevention. The philanthropic outlook is towards the cure and the relief of the individual. The two spheres are closely linked, and successful effort in the one is projected into the other.

Within the official sphere falls especially the institution and direction of a scheme of notification. To the same sphere belongs dissemination of information in matters relating to the prevention and limitation of tuberculosis, and the practical carrying out of disinfection.

Intimately related to this is the system of domiciliary visitation which forms so important a part of the dispensary's activity. The dispensary thus forms a link between the tuberculous poor and the authorities. I am so much impressed with the extreme significance to the community of the various operations of the dispensary that I believe the dispensary should either be worked by the municipality or other local authority itself, or at least be in close touch with such authority.

The more intimate the connection, the better. For a large proportion of patients, and for long periods — it may be throughout the entire illness — the dispensary will take the place of the hospital in respect of care and general direction. On this account the dispensary should be closely related to, if not an actual part of, the public health service.

To the official sphere should certainly belong the hospital for advanced and dying cases. The purpose of these hospitals is entirely different from that of the sanatorium. Such cases ought to be segregated on grounds of public health and in the interest of the unaffected citizen. This is

emphatically a department of the work to which public funds are legitimately devoted.

Within the philanthropic sphere falls naturally the sanatorium for early cases. The sanatorium exists especially with a view to the effective cure of individuals at an early stage of the disease. Sanatoriums are suitably maintained by charitable effort, by contributions of patients or of private friends interested in particular patients, by workingmen's sick and benefit societies, in varying fashion, according to the varying conditions of different countries, and by local authorities, in so far as the efforts of these can extend, after due regard has been paid to the other claims which have been cited.

Within the philanthropic sphere fall similarly extensions of the sanatorium in the direction of working colonies, after-care associations and the like, which may be multiplied indefinitely according as the need presents itself.

To this sphere also belong the various voluntary agencies, associations, leagues, etc., which, as the anti-tuberculosis movement extends throughout the world, serve to effect a popular propaganda until such time as the complete organization can be attained.

#### LEGISLATIVE ACTION.

As the *motif* for anti-tuberculosis organization becomes better apprehended, it will gradually cease to be a matter for private initiative and enterprise. Communities will be compelled to face the matter in thoroughgoing fashion.

Subject to modification dependent on local conditions, a scheme of co-operative measures must be elaborated which will recognize the rôle and significance of public and private effort respectively. The scheme will necessarily combine the application of sanitary principles, in the broadest sense, with more direct, offensive measures against the tubercle bacillus. This implies the co-operation of public health authorities, local authorities and legislators.

#### ILLUSTRATIVE CHARTS.

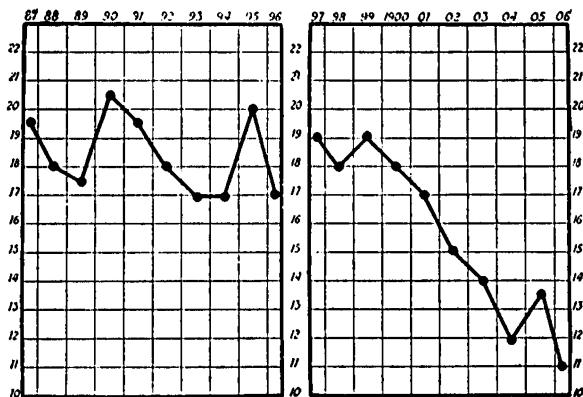
The accompanying charts illustrate several points of interest in relation to tuberculosis during the past twenty years.

I have selected that period for the reason, first, that it represents approximately the time during which more definite efforts have been made in any country against tuberculosis. In the second place, the twenty years happen to correspond with the activity of the Edinburgh organization, which commenced with the establishment in 1887 of the Victoria Dispensary for Consumption. In preparing the present address I have drawn largely from the evidence which has been gradually accumulated by that institution.

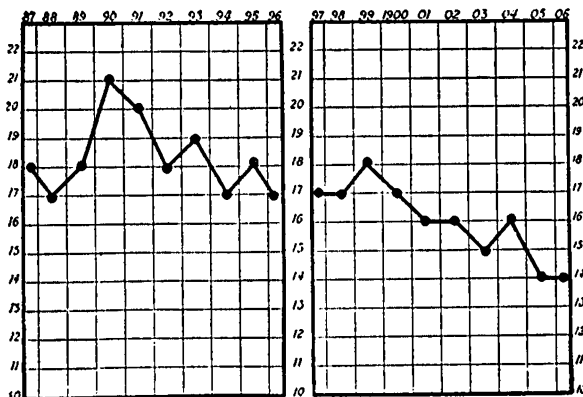
The charts show the curve of mortality from pulmonary tuberculosis for London and Edinburgh respectively. I have divided the period into two periods of ten years each. During the first of these periods, necessarily the direction of anti-tuberculosis effort was rather indefinite.

Even when anti-tuberculosis effort had assumed more definite shape, time was needed before the effect of effort began to register itself in the death-rate.

The curves are interesting in both cases. They illustrate sufficiently what has been frequently pointed out, namely, the steady improvement in relation to tuberculosis which is in progress in many centers.



In the case of Edinburgh, I think, without straining the point, the curve affords significant evidence of the influence exercised on tuberculosis by the institution of organized and co-ordinated effort. In addition to less definite agencies, there has occurred in Edinburgh from 1887 onwards the gradual evolution of an anti-tuberculosis scheme, including the dispensary, with its system of domiciliary visitation, etc., the sanatorium, the hospital for advanced cases, the working colony and finally compulsory notification.



The charts show how, from 1887 onwards, the mortality from tuberculosis has fallen progressively. The Edinburgh fall during the latter ten years is especially striking. It is quite out of proportion to that of the precedent ten years and remarkably more rapid than that shown in the London curve. It seems fair to associate this to some degree with the development of the completer organization.

The view is confirmed by comparison of the curves in the case of the other chief cities of

Scotland. Without reproducing the entire curves I content myself with citing in tabular fashion the death-rate per 10,000 of the population at the close of each period of ten years, and at the middle of the latter period.

DEATH-RATE FROM PULMONARY TUBERCULOSIS PER 10,000 OF POPULATION IN THE PRINCIPAL TOWNS OF SCOTLAND (1897, 1901, 1906).

	1897.	1901.	1906.
Glasgow	20.3	18.5	15.6
Dundee	22.3	17.2	16.9
Aberdeen	16.7	13.9	12.2
Leith	21.2	19.2	12.7
Paisley	17.8	16.6	12.8
Greenock	20.7	14.8	13.2
Perth	22.1	16.1	17.9

If these figures be compared with those embodied in the curves for London and Edinburgh, the rapid fall in the case of Edinburgh, especially from 1900 onwards, appears even more remarkable. Of other towns in Scotland, that which most approximates Edinburgh, so far as these statistics are concerned, is Leith. It is worthy of note that, although Leith is a separate municipality, it is actually continuous with Edinburgh. Many patients from the smaller town receive treatment at the dispensary or at the sanatorium in Edinburgh. Without detracting from the credit due to the anti-tuberculosis activity of Leith, it seems fair to suggest that the striking fall in mortality in Leith, as compared with other towns in Scotland during the last half-dozen years, may be, in part, traceable to the organized program which has been operative in Edinburgh for a prolonged period.

#### EFFECTIVENESS THE MEASURE OF SUCCESS.

In thus reviewing the subject and citing statistics to illustrate the significance of organized effort against tuberculosis, it is far from my wish to press conclusions further than the facts seem thoroughly to warrant.

It has been my endeavor to divest myself for the time being of any relationship to existing operations, and to weigh the facts in a judicial spirit. The conclusion appears to me unavoidable that the measure of success in the anti-tuberculosis campaign is governed by the degree of completeness and efficiency of the program which is adopted.

An effective program against tuberculosis demands a clear conception of the vast extent of the campaign, concentration of effort, thorough organization and harmonious co-ordination of measures. With such a program, history and analogy promise alike that a successful issue is assured.

DENMARK'S SANATORIUM PROVISION FOR TUBERCULOSIS. — The *Tidsskrift for den Norske Lægeforening* states that the completion of the sanatorium at Nakkebo gives a larger number of beds in the popular tuberculosis sanatoria than there is *per capita* of the total population in any other country. The sanatoria can now accommodate 1,000.