An Address

ON THE

PUBLIC ASPECTS OF THE PREVENTION OF CONSUMPTION.

DELIVERED BEFORE THE EDINBURGH SANITARY SOCIETY.

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TWENTY-FIVE years have wellnigh passed since the essential cause of consumption was definitely determined and announced to the world. Of the scientific fact there can be no manner of doubt. This is admitted on every side. Yet this evening the question forces itself urgently, What practical benefit has accrued therefrom to the communities of men? Have communities enjoyed the fruits to which they are entitled from Koch's great epoch-making discovery?

In answering the latter question decidedly in the negative, it is admitted freely that certain natural causes have contributed to the result. In 1881, the world was hardly prepared for the swift intimation that consumption, whose nature seemed popularly known, and whose causation was regarded as ascertained, had been thoroughly misunderstood, and that in place of depending on a variety of ill-defined causes, was due to a specific micro-organism, recognized then for the first time.

The existing generation of medical authorities looked askance at the novel doctrine and, in many instances, offered determined opposition. As the older generation has receded and the younger has advanced, a change of thought—in some quarters a remarkable change of thought—has been effected. Through the labours of individual workers in different lands there has occurred a great determination of attention on more scientific lines. Especially is this true so far as the pathology of the disease is concerned. The change which has come over the pathological conception during a quarter of a century is immense. The comparison of any treatise on consumption of thirty years ago with the present-day treatise on the same subject reveals an extraordinary advance.

And no less on the therapeutic side have great strides been made. Striking alterations have been effected in relation to the curative treatment of the individual. The consumptive patient nowadays occupies a platform of hopefulness previously but little dreamt of. His horizon to-day is brighter with promise than ever it has been.

But the more public aspect of the question calls for much to be done. Happily, throughout the world there begin to emerge indications of awakening to the rightful claims of communities in this respect. The adoption of preventive measures against tuberculosis on a more or less extensive scale has been proposed in most parts of the civilized world. To some extent these have been carried out. *But if communities, as communities, are to benefit practically by the discovery of the tubercle bacillus to the extent which the discovery warrants, there is clamant need for a vastly wider organization and co-ordination of measures than has yet been realized.*

In proceeding to elaborate this thesis, I desire it to be clearly understood that the significance of general sanitary measures in relation to the limitation and prevention of tuberculosis is not underestimated by me, far less forgotten. The importance of these can hardly be overestimated in relation to the entire group of infectious diseases—a group to which we now relegate consumption. The earnest thinker and worker in the sphere of tuberculosis will be the first to admit that those great principles which have rescued the world from incursions of infectious disease, through overcrowding and ignorance, are applicable, in the fullest sense, to the solution of the tuberculosis problem. It is freely admitted that, with the development of wiser and wider sanitary measures, the incidence of, and mortality from, tuberculosis have remarkably lessened.

Notwithstanding, it remains true that an enormous proportion of the human race is still affected by, and a still greater number remains unnecessarily exposed to, tuberculosis. There is great reason to doubt whether the

frequency of tuberculosis is even distantly guessed. The usually-accepted statement that from one-seventh to one-tenth of the race die from tuberculosis—grave as it is—does not exhaust the truth. The records of *post-mortem* examinations show that at least one-third, and probably one-half, of all persons dying bear traces of tuberculosis in one shape or another. The experience of our hospitals and dispensaries emphasizes the view that the statistics of mortality from tuberculosis insufficiently suggest the great frequency of its incidence. Through the system of domiciliary visitation instituted by me many years ago in connexion with the Royal Victoria Dispensary for Consumption in this city, I have had occasion to realize the appalling frequency with which several members of the same household in the contracted dwellings of the poor are simultaneously affected by tuberculosis. There is abundant reason for the statement that there are in every great centre crowds of infected dwellings—veritable nests of tuberculosis—entrance into which, or at least residence for any time in which, is necessarily accompanied with the greatest risk.

In a previous paper¹ on this subject, I made a calculation that the ascertained mortality from consumption in any city might be safely multiplied by 10, in order to represent approximately the number of persons living, *already seriously affected*. Fuller investigation into the subject has convinced me that this figure is, as I indeed hinted it probably was, much within the mark. I am satisfied that twice the figure is still below the mark. Taking, then, for example, the city of Edinburgh, whose mortality from consumption is approximately 400 per annum, we may assume that, within the area of the city, more than 8,000 persons are already seriously affected by the disease. And it is to be kept in view that this figure applies to involvement of the lungs only, and is exclusive of tuberculous affections of other organs.

What, then, should be the attitude of the citizen to the question? He is entitled to assume that the etiological relationships of the tubercle bacillus to consumption have been completely established. He is entitled to demand, as a member of the community, in the interests of the community, that information should be obtained as to the actual extent of the disease in the community. He is entitled to inquire what special measures have been taken by the authorities for dealing directly with the tubercle bacillus as an existing cause of disease. He is bound in self-interest to weigh intelligently the sufficiency of these, with the help of such expert advice as may be attainable. In so far as they appear insufficient, he is entitled to insist on their amendment, or their completion.

As I have had occasion to point out elsewhere,²

Most existing movements against tuberculosis fail in attaining all they might, because they are too partial. In many centres throughout the world antituberculosis societies have been founded. The intentions of these have been good, but in practice less has been effected than is to be desired, from insufficiency in the plan of operations. Excellent as much of the work has been, there is too generally lacking the element of efficient organization.

Through the agency of such societies there has been disseminated a large amount of serviceable information regarding the nature and prevention of the disease, and public interest in the subject has been aroused. Under the *aegis* of such societies, or other charitable or public bodies, provision has been made for the treatment of a certain number of cases of tuberculosis. Sanatoriums have been founded in many places for the curative treatment of more hopeful cases, and hospitals or asylums have been established for the reception of patients in more advanced stages of the disease. Some communities have favoured attacking the early cases, and aimed specially at the cure, or at least the relief, of the individual; while others have attacked specially the later cases, with a view to preventive treatment.

In not a few instances the conception of founding sanatoriums has bulked too largely in antituberculosis movements. The public have been 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 accumulate, and as these are found less uniformly good than the hopefulness of the over-sanguine had expected, there begins to be manifested a feeling of disappointment and almost of annoyance. Already the question is being freely asked, "Are sanatoriums worth while?"

It is not my purpose on the present occasion to refute the view that sanatorium treatment is a failure. To any one familiar with the facts this will appear needless. The sanatorium constitutes an important division of the work. But the problem of the extermination of tuberculosis is too vast to be solved in so simple a fashion. The outlook of the

sanatorium is towards the recovery of a certain proportion of early cases. But the number of cases ultimately cured by sanatorium treatment is small in proportion to the major issue, namely, the suppression of the disease.

Tuberculosis is a disease of infectious nature, and as such must be treated on the same broad principles on which we treat other infections. While this is true, there are many difficulties of a practical nature. Although of infectious nature, tuberculosis is a peculiar disease—peculiar in respect of its mode of dissemination, and the conditions of environment on which this depends, peculiar in the variety of its manifestations, and peculiar because of its commonly prolonged course. On these grounds, the plan of combating tuberculosis cannot be modelled entirely on those which have been found serviceable in the treatment of other fevers.

The solution of so vast and far-reaching a social problem can only be hoped for by means of a most carefully organized and co-ordinated plan of action. Much will be gained by uniformity of plan throughout the country, and, so far as possible, throughout the world. Such a scheme of organized and co-ordinated operations against tuberculosis must, in my opinion, include for all our larger centres the following factors, to which I desire severally to direct your attention.

1. Notification of the disease.
2. A tuberculosis dispensary.
3. A hospital for dying patients.
4. A sanatorium, or sanatoriums, for selected patients with a view to cure the disease.
5. Colonies for the residence and guidance of patients in whom the disease is latent, or has been arrested, and for whom carefully-selected and supervised employment is desirable.

I.—NOTIFICATION OF THE DISEASE.

Since my earliest intimate associations with the subject, I have been convinced of the necessity for and the advantages which must follow from the adoption of compulsory notification. It is almost exactly sixteen years ago since, on the invitation of the Edinburgh Health Society, I delivered a lecture on the subject of consumption. On referring to the published volume, in view of the present meeting, I find that I expressed myself as follows: "So far as infectious conditions are concerned, as you know—thanks to the foresight and untiring energy of our veteran medical officer of health—we live in peculiarly happy circumstances. All cases of infectious disease which occur within the city must now be reported and recorded at the city's expense; and the result is that within a very short time after the outbreak of an epidemic, it is known exactly at head quarters how the disease is distributed, and special measures of investigation or treatment can be instituted. Again, it is similarly known if the epidemic continue longer in certain districts than in others, and an explanation may then be suggested. To-night I should press strongly for the inclusion of consumptive cases in such compulsory returns. Nothing but good can, in my opinion, result from this extension of a most valuable method. Were it adopted, we should soon have most valuable confirmation—or let us suppose, the opposite, although I do not think this latter likely—of the statements which have been made regarding the communicability of consumption, and the tendency to its occurrence in certain houses and districts. Edinburgh will make a big move—and a move, I make bold to say, in which she will be speedily followed by many—if her medical officer of health will stimulate the authorities to this further development."

This view, as expressed in 1890, has continued unchanged. It has remained my fixed conviction that compulsory notification affords the only sound and ultimate solution of the consumption problem.

All the difficulties which, so far as I am aware, have from time to time been suggested in relation to the practical carrying out of notification, were all similarly advanced in connexion with the proposed notification of other infectious diseases, and indeed in relation to other State and municipal procedure. Such difficulties were promised in relation to the income tax schedule and other Government inquiries. Experience has shown that these difficulties rapidly melt away in practice. At the worst, they are insignificant, in the present issue, when compared with the vastness and gravity of the evil to be combated.

Until recently the real practical difficulty in the way of compulsory notification has been the attitude adopted by the Local Government Boards, both in England and Scot-

land. In the case of England, that attitude remains one of reserve, partly, no doubt, because of the lack of unanimity among medical authorities in the South. The Local Government Board for Scotland has recently, in its circular of March 10th of the present year, thrown aside its earlier reserve and voiced the view that a system of notification promises the solution of many of the difficulties of the tuberculosis problem.

The circular, which I would commend to your careful perusal, boldly pronounces that pulmonary phthisis is an infectious disease within the meaning of the Public Health (Scotland) Act, 1897. As a consequence of this, the sections of the Public Health Act applicable to other infectious diseases are applicable to pulmonary phthisis. The circular indicates that a system of notification is necessary if the Public Health Act is to be applied effectively to pulmonary tuberculosis. It sanctions the addition by the local authority, with the approval of the Board, of pulmonary phthisis to the lists of diseases notifiable under the Infectious Diseases Act, 1889. It announces the readiness of the Board to give favourable consideration to applications from local authorities for such inclusion of pulmonary phthisis, insisting, however, that the local authority should first put itself in a position to deal sufficiently with cases after notification.

It thus appears that there is no need—as was at one time suggested—for fresh legislation, but that the Local Government Boards are possessed of sufficient powers to sanction and recommend compulsory notification. The chief cause for delay, in Scotland, at least, has been the need for assurance that local authorities were able financially and otherwise to take such effective action after notification as the facts should justify.

Compulsory notification of consumption is not an untried conception. It has been introduced and carried out with much success in Norway and the United States—New York in particular. I have the direct personal assurance of Dr. Hanssen, the leading authority on tuberculosis in Norway, who was largely instrumental in carrying through the system of notification, that the plan has been carried out there for some years without the slightest hitch.

The experience in New York is similarly of a most reassuring character. In 1893, among other measures taken for the prevention of consumption, notification "was required of cases of consumption in all public institutions, and notification was requested voluntarily from doctors, of cases occurring in their private practice." In 1894 there were notified 4,166 cases, in 1895 5,618, and in 1896, 8,334. This striking increase in the figures notified, even under a voluntary system, affords a strong proof that no hitch is likely to occur. Not only so, but so satisfactorily did the matter work out that in 1897 the Health Board of New York declared pulmonary tuberculosis to be "an infectious and communicable disease," and required "notification of all cases of consumption occurring in the city." Let it be kept in view that that declaration and enactment were made nine years ago. I have excellent authority for saying that since then compulsory notification has been carried out smoothly and efficiently.

In the United Kingdom opinion is gradually ripening. Several towns in England have during the past few years adopted a system of voluntary notification. Manchester was especially early in the field, and a most complete and effective system of voluntary notification has been established. Similar methods have been instituted in Brighton, Leeds, Bradford, and Liverpool. Finally, Sheffield, which for several years had had experience of voluntary notification, obtained powers in the Sheffield Corporation Act, 1903, to introduce compulsory notification. Notification was finally declared compulsory two years ago.

In Scotland the first attempt at notification was made in Edinburgh, where a system of voluntary notification was instituted in 1903. The system, for one reason or another, seems to have been carried out with less completeness than in some other centres. Notifications were made, apparently, with a certain amount of hesitancy. So far as I can make out, from inquiry among medical men, this was less from unwillingness than from uncertainty as to what was really proposed. No great encouragement was extended to practitioners to co-operate in notification. In spite of this lack, I may mention, as showing the significance of the method, that no fewer than 855 notifications were made during 1903-05 to the city

authorities by the Royal Victoria Dispensary. The notifications were attested by bacteriological examination at the dispensary and the determination of the tubercle bacillus.

Since the publication of the circular by the Local Government Board (March, 1906), there are not wanting signs that compulsory notification will speedily be adopted throughout Scotland. Edinburgh has already faced the question, and almost carried compulsory notification. Glasgow is on the eve of achieving the same result. Several of the smaller burghs have either obtained, or requested, the sanction of the Local Government Board to the same end.

Looking further afield, the International Congress on Tuberculosis, held at Paris in October, 1905, with representatives from all the civilized countries, whose outlook on the question was correspondingly very various, adopted unanimously the following conclusion: "That it is desirable that it should be the general practice to notify all cases of advanced tuberculosis."

AFTER NOTIFICATION WHAT THEN?

Two mistaken conceptions are current as to what is implied in notification. On the one hand, there are those who suppose that notification implies the removal of every notified person to some institution—the segregation of all cases of pulmonary tuberculosis in the same way as segregation is practised in relation to the acute fevers. It is assumed that, unless sufficient hospital accommodation is available, there can be no significance in notification, and the expense employed in a system of notification is therefore unwarranted. On the other hand, there are those who seem to suppose that notification itself is somehow to effect the extermination of the disease.

I fear that in neither of these views is sufficient account taken of the far-reaching ramifications of tuberculosis. In some instances, notification need be followed by no special measures. In some, the removal of the patient to a suitable hospital will be sufficient. In many instances, notification of a case of consumption is tantamount to the discovery of a whole nest of disease. As I have indicated, my experience in Edinburgh is that very generally several cases of consumption are found in the same household—some of them not previously dreamt of—and the house itself is probably infected. In such case, then, notification will raise a vast number of questions as to the suitable disposal of the varying elements at this focus of infection. The several elements will require different lines of action. This naturally leads us to a consideration of—

II. THE TUBERCULOSIS DISPENSARY.

The dispensary as a factor in the campaign against tuberculosis is no longer on its trial. In any complete organization against tuberculosis the dispensary will be found to play a most important part. This has been my belief for many years. It was this that led to the foundation by me in 1887 of the Victoria Dispensary for Consumption in Edinburgh.

The practical value of what was then an *a priori* conception has been firmly established during the development of details. Increasing familiarity with the idea has led recently to a widespread recognition of the significance of the dispensary. The rapid, and apparently independent, erection within the past six years of similar institutions in Belgium, France, and Germany, affords remarkable testimony to their value. The recent international congresses at Paris and The Hague have voiced a unanimous opinion regarding their extreme utility.

The object I had in view in proposing the establishment of a dispensary for tuberculosis was the formation of a central institution to which persons of the poorer classes affected by tuberculosis should be invited or directed. It seemed thereby that access would be readily obtained to existing foci of disease, not merely in affected individuals under examination, but also in other members of the same household, and in affected dwellings. The programme of the Victoria Dispensary was as follows:

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 patient's condition seemed 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 of treatment and 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.

PREMISES AND STAFF.

The Victoria Dispensary, as at present arranged, contains:

Two consulting rooms, a laryngoscopic room, one large waiting room, two dressing rooms (male and female), a general office where names are entered, a laboratory for bacteriological examinations, a drug and food store.

The dispensary is open thrice weekly for three or four hours.

The staff consists of:

1. Four qualified physicians who attend when the dispensary is open for the purpose of examining and instructing patients. Three of the physicians are honorary.

2. One of the medical officers receives a salary of £60 a year, and devotes a large amount of time to the work. In addition to examining patients at the institution, along with the honorary physicians, he pays domiciliary visits to the dwellings of patients in co-operation with the trained nurse. He makes bacteriological examinations of expectoration and other suspect discharges. By arrangement with the city authorities, he notifies all cases of tuberculosis which he meets. He advises regarding the disinfection of houses during illness and after the removal or death of the patient. He supervises treatment of patients at their own home when this is desirable. He selects suitable patients for the sanatorium. In co-operation with the city authorities he drafts the more advanced or dying patients to a hospital now dedicated to such cases in the neighbourhood of the city.

3. A nurse who has been carefully trained in modern open-air methods at the Royal Victoria Hospital for Consumption, Edinburgh—the sanatorium in connexion with the Dispensary—visits the homes of the patients. She readily wins their confidence by her interest in their welfare. She instructs the patients, or their friends (wives, mothers, etc.), both as to treatment and prevention. In co-operation with the visiting physician, she reports regarding the patient's residence and other conditions according to the annexed schedule of inquiry. The reports, when completed, are vouched for by the signature of both doctor and nurse.

SCHEDULE OF INQUIRY REGARDING DISPENSARY PATIENTS.

No. in Ledger.....	Date of Report.....
Name	Age
Address	Married or single?
Occupation	Has patient changed occupation?
Able to work full time?	Or part time?
If unable, confined to bed?	
How long ill?	
Situation of house (area, ground floor, first, etc.)?	
Number and ages of inmates?	
Number and description of rooms?	
General aspect of house (clean, damp, dusty, smelly)?	
Number of windows?	Can they open?
Are they kept open (a) by day?	
(b) by night?	
Have they always been kept open?	
Does patient sleep alone (a) in bed?	
(b) in room?	
How is washing of clothes done?	
How long in present house?	
If has moved within two years, previous addresses?	
Have there been illness or deaths in house?	
(a) In own time?	
(b) In previous occupancy?	
Exposed to infection (a) at home?	
(b) at work?	
(c) among friends?	

Present health of other members of household ?
 What precaution taken to disinfect ?
 T. B. in sputum ?
 T. B. in dust of room ?
 General dietary ? Teetotal ?
 General condition (well-to-do, badly off) ?
 Proximate income of household ?
 Assisted by societies, church, friends, rates ?

Signed.....Reporter.
Medical Officer.

4. A volunteer Samaritan Committee of ladies, in conference with the doctors, take charge of more distressing cases, where, through prolonged illness, the financial conditions have been much reduced. In many cases they visit the patients' houses. With the assistance of the numerous charitable and parochial organizations which exist in the city, they are enabled to adapt the relief necessary to the particular case. The members of the Samaritan Committee further occupy themselves with the question of suitable employment for tuberculous persons fit for some effort, although unable to work an entire day. In some cases they arrange likewise for persons who have been discharged from the sanatorium. Attention is also paid to the case of school children affected with the disease, so as to have their education supervised on more physiological lines. The operations of the Committee are regulated at fortnightly meetings, and a minute of the business is kept.

5. An officer—a working man who gives his entire time to the dispensary—lives on the premises. This man receives and enters the names of the patients on the afternoons when the dispensary is open. When the dispensary is not formally open he attends to requests from patients or other persons. The officer is conversant with the home and work conditions of many of the patients, and is a valuable lieutenant both to the doctors and nurse.

RESULTS OF DISPENSARY OPERATIONS.

The organization of the dispensary is thorough. Each part of the system is closely related to the rest, so that a large amount of work is expeditiously and inexpensively overtaken. From first to last we have found no difficulty whatsoever in relation to the nurse's house-to-house visits. On the contrary, these have been most gladly welcomed by all types of patients and her inquiries willingly answered. There can be no doubt that the system of domiciliary visitation by a specially-trained nurse, in co-operation with the doctor, has been a sanitary agent of great importance to the city.

The dispensary's programme has been successfully carried out by the staff during the past nineteen years. During each year some 17,000 attendances have been registered. As many as 87 individual patients have been received in one day. About 1,000 reports are made annually regarding the home conditions of patients, and about as many notifications have been made to the city authorities.

By means of the systematic record of the home conditions, according to the schedule referred to, there has been accumulated a great mass of valuable statistics and information regarding the incidence of the disease in the district. These are continually added to from day to day.

An analysis of these records has yielded facts of the greatest importance. Thus, there has been illustrated the extreme frequency of tuberculous disease in children and in housewives. A map of the city has been made, showing the frequency of the disease in certain houses and streets. Proof has been obtained of its occurrence along with various insanitary conditions of dwellings (insufficient air, absence of sunlight, etc.), and the attention of the authorities has been drawn to the fact. The reports show the frequency with which one or more persons share a room, or even a bed, with the consumptive patient. Particular attention has been paid to such cases, either by removal of the affected patient (a) to a sanatorium, or (b) to a hospital for dying cases, or by removal of unaffected members of the household to healthier surroundings. One of the doctor's duties in such circumstances is to examine into the health of other members of the family. It is remarkable how frequently two, three, or even more persons, not previously suspected, have thus been shown to be tuberculous. Another important point has emerged, namely, the frequency with which the tuberculous patient, from one cause or another—often from financial reasons—changes his house. By this means infected areas become

quickly multiplied. The records also show the absence—apart from the interference of the dispensary—of precautions with a view to disinfection. Now, happily, by arrangement with the city authorities, the dwellings of such patients are disinfected at the city expense.

It has been sometimes maintained that such a dispensary is impracticable, as running counter to the interests of, and therefore likely to be opposed by, the medical practitioners of the place. This has not been the experience of the Victoria Dispensary. From the first, a large number of the doctors co-operated cordially with the promoters of the movement. Now that the aims of the institution are thoroughly understood, the great body of the profession avail themselves freely of its resources. A large proportion of the patients received at the institution are sent by medical practitioners, either for diagnosis, in doubtful cases, or for treatment and other guidance. The Royal Infirmary and other hospitals throughout the city work similarly in harmony.

It should be clearly understood that a dispensary such as this is a much more elaborate institution than exists in relation to the out-patient departments of consumption or other hospitals. The latter, doubtless, do excellent work, so far as their resources allow. Their effort is, however, primarily directed towards the treatment of the *individual* patient, and little attention is extended to the wider aspect of the tuberculosis problem.

The tuberculosis dispensary should be, for every city or district, the uniting point of all other agencies. It should not be an isolated institution, but form an integral part, indeed the centre, of a great network of operations. To the dispensary, tuberculous patients of the poorer classes, and patients with chronic colds or persistent ill-health, should be invited. Tuberculous patients presenting themselves at infirmaries, hospitals, and other charitable institutions, should be directed to the tuberculous dispensary. Employers of labour and heads of public works should be apprised of the existence of the dispensary, so that invalid employes may be directed thither. The public should be made aware that the dispensary is prepared to answer all inquiries regarding tuberculosis, and to advise, in a given case, what is best to be done. The dispensary should constitute a centre for the dissemination, in the widest fashion, of information regarding prevention and treatment.

You may perhaps get a clearer notion of my conception of the dispensary if you will glance at the accompanying diagrammatic scheme (Diagram 1). It illustrates the position of the dispensary as the centre towards which patients and other inquirers regarding tuberculous matters are directed, and from which advice and other information are distributed. The double lines indicate the connexion which should exist between the dispensary and the other elements in the organization—on the one hand the hospital for advanced cases, and on the other the sanatorium for early cases. Other points illustrated by the sketch will appear as we proceed.

Every step in the gradual development of the Edinburgh scheme has strengthened my belief in the efficacy of the tuberculosis dispensary as a base for further operations. In this belief, I recommend to every considerable community the establishment of such an institution, which will serve at once as a developmental centre and uniting point of other agencies.

It seems to me, indeed, difficult to overestimate the value of the dispensary as an instrument of preventive medicine—whether as a bureau for receipt and distribution of information and assistance, or as a clearing house in respect of the vast amount of tuberculous material with which every community will find itself called upon to deal.

III. HOSPITAL FOR ADVANCED OR DYING PATIENTS.

There can be no manner of doubt that the far-advanced or dying cases constitute the greatest source of infection. This is most especially true in the case of those affected by the disease resident in the contracted dwellings of the poor, where perhaps an entire family shares a room with the consumptive patient. All such patients require immediate removal to a hospital reserved for advanced and dying cases of consumption.

Take, as an example of the sort of thing, two recent cases from the dispensary list:

1. E. F., a married woman, aged 35, visited the dispensary, and was found to be so ill that she was immediately ordered

home to bed. The dispensary medical officer visited her and determined the presence of very advanced disease. As no hospital accommodation then existed for such cases, he continued attendance for months, till her death. His report is that he never visited such a filthy, desolate house. It consisted of one room, in which resided the patient, her husband, and child. The patient was bedridden for many weeks. Beside the bed stood a pail into which the poor creature made feeble attempts to expectorate. The expectoration was visible all over the bedclothes, the floor, and the wall. Till the visit of the Victoria Dispensary Medical Officer, followed by that of one of our trained nurses, there was no attempt at nursing or proper feeding, still less of disinfection. Suitable nursing and strict measures of disinfection were then instituted, both during the patient's life and after death.

2. W. B., aged 20, presented himself at the dispensary suffering from advanced consumption. His case was similarly undertaken by the dispensary medical officer. He lived in a sunk flat, in a room where his father had died of consumption just twelve months before. The room was large and clean, but sunlight never reached it. Ventilation was defective in the extreme. His mother supported herself and three more of a family by going out, from this insanitary home, to wash and assist in other people's houses. Treatment, disinfection, and other measures of prevention were under taken by the dispensary medical officer.

Such cases might be multiplied indefinitely from the records of the dispensary.

It was with a view to the reception of such advanced patients, whose surroundings and hygienic conditions are prejudicial, not only to themselves but to all who are brought into close contact with them, that in the Health Lecture referred to (1890) I proposed that a portion of our city hospital should be devoted to the reception of dying cases of consumption:

With a view of preventing the spread of phthisis among the very poor, for the community's sake, I should have a portion of our city hospital—in lieu of any better institution elsewhere—devoted to the reception of dying cases of phthisis whose surroundings and hygienic conditions are not only fatal to themselves, but, in my judgement, eminently prejudicial to all those who are brought into the close contact with them which the life of a family in one or two rooms involves. Such cases cannot, of course, in any number be received into the Royal Infirmary, nor is it desirable that they should. But I desire to-night to rouse the citizens to the responsibility they assume in permitting such chronic sources of infection to smoulder in their midst under conditions which are undoubtedly most calculated to fatal propagation.

More recently I was frequently consulted regarding this and other aspects of the question by the late Mr. Pollard, the then convener of the Public Health Committee, whose keen, far-reaching interest in this matter is worthy of fresh record. His desire to have the matter viewed from most varying standpoints resulted in a Conference within the City Chambers on February 9th, 1899, between a Subcommittee of the Public Health Committee, representing the Town Council, and Representatives of the Medical Faculty of the University of Edinburgh, the Royal College of Physicians, the Royal College of Surgeons, and the Veterinary Colleges.

The outcome of all this was the proposal—contained in a careful and elaborate report by Mr. Pollard, dated July 23rd, 1900—to the effect that 100 beds in the old City Hospital should be utilized for the purpose. This

proposal, after what has appeared—may I say with all respect?—rather unnecessary delay, has finally come to fruition in the arrangement, happily achieved by Convener Gibson, for the reception of 50 cases of advanced consumption at the new City Hospital, Gолinton Mains, an arrangement which, I understand, is working well.

At no distant date, I anticipate we shall have hospitals for advanced consumption as generally distributed throughout the country as are hospitals for the more acute infectious diseases. The Local Government Board for Scotland has, in the Circular already referred to, indicated most plainly that "the isolation of such dangerous cases is a primary duty of the local authority."

With reference to hospitals for advanced cases, it should be strictly kept in view that patients must, in the ordinary course, continue in the hospital until the end. The end may, and in many cases certainly will, be long delayed. If the hospital is to fulfil its mission, from the sanitary and economic standpoint, patients once admitted must not be discharged, save for quite exceptional reasons. To

make the patient a little better and then discharge him from further treatment, is almost completely to negative the purpose for which the hospital was instituted.

IV. SANATORIUM FOR SELECTED PERSONS WITH A VIEW TO CURE.

While isolation for advanced cases is desirable from the point of view of prevention, the sanatorium is concerned chiefly with the effective arrest of the disease.

The great aim of sanatorium treatment is to get the patient at a sufficiently early stage, and, by means of open air treatment, proper dietary, and a carefully conceived regimen, to assist Nature in her attempt to resist invasion by the tubercle bacillus. The purpose is to increase vital resistance and thus establish more or less immunity to the disease. As the discovery

of more specific methods of treatment proceeds these will naturally be utilized.

The essential of the present-day sanatorium idea is the free exposure of the patient to open air. He must be bathed in fresh, pure air day and night, and this irrespective of the goodness or badness of the weather, as popularly understood. The more sunshine, or at least sunlight, the better for the patient. The two conditions which the tubercle bacillus cannot withstand are fresh air and sunlight. If the patient will only be out of doors, lying, sitting, walking, or working, according to the nature of the case, a large part of each day, and, when indoors, will allow the freest access of fresh air day and night, satisfactory results may be obtained almost anywhere.

Sanatoriums should be founded in immediate relationship to the large centres. I desire to insist on this point with much emphasis. It is of the first importance to the hopeful tackling of the question, in the widest sense, that patients and the public should get rid of the prevalent, but most erroneous, belief that a cure can only be effected and health maintained under conditions which their ordinary residence and station in life will not permit them to enjoy.

It has been demonstrated in the most conclusive way—

Diagrammatic scheme showing interrelations of the dispensary and other elements in the antituberculosis organization.

and in this matter the experience of the Royal Victoria Hospital for Consumption at Edinburgh has been frequently cited in evidence—that, just as consumption occurs in all countries where the disease has obtained a footing, “it can be treated in all climates with approximately equal success, or want of success, according as the larger indications for treatment are fulfilled or overlooked.”³

It is consequently evident, and is emphatically advantageous, that the sanatorium or hospital for curative treatment should be reasonably near the town chiefly interested.

RESULTS OF SANATORIUM TREATMENT.

The results of sanatorium treatment are highly encouraging, notwithstanding statements made from time to time to a contrary effect. Under sound sanatorium treatment the lives of thousands have already been saved. Hundreds have to my knowledge been rendered fit to return to ordinary work, or, without complete recovery, have been able to resume work of a less exacting nature. If treatment be undertaken reasonably early, it is the exception to find a patient who does not progress persistently so long as treatment is maintained. In many instances results are obtained which can only be described as marvellous.

If the results are not so uniformly good as might be desired, the sum total of complete or economic cures is still very great. The results would be much better if there were a more complete understanding as to what constitutes an early and suitable case. In too many instances sanatoriums are overloaded with advanced and even dying cases which ought to be dealt with in the special hospitals already referred to.

From the educational point of view, both as regards patients and the community, the sanatorium plays a highly important part. Patients learn how to treat themselves, and they leave the hospital apostles of the true faith, which thus gradually spreads throughout the land.

The immense economic value of working men's sanatoriums is best illustrated by facts relative to the system of compulsory insurance against sickness in Germany. Since the year 1897, such insurance societies have, in self-interest, maintained no fewer than 101,806 tuberculous patients at special establishments for a period amounting to 7,687,805 days at a cost of about £2,000,000 sterling. The insurance companies have spent £10,550,000 sterling in building sanatoriums. The percentage of patients who, five years after treatment, were still able to work, and did not require any allowance from their insurance fund amounted to 27, 31, 32, and 31 for the years 1897, 1898, 1899, and 1900 respectively.

SANATORIUM BUILDINGS.

As to sanatorium buildings, these need not—and should not—be expensive. As the result of prolonged experiment and thought on this matter, I am satisfied that the separate one-storied pavilion is the best type of building for the purpose. The Royal Victoria Hospital for Consumption, Edinburgh, was designed by Messrs. Sydney Mitchell and Wilson, Edinburgh, to meet my views in the matter. After trial of those portions of the building which have been in existence for some years, I can most confidently recommend it as answering every purpose of a sanatorium perfectly.

Each pavilion is of winged form, the obtuse retreating angle being oriented, so as to face south-south-east. Each of the two wings constitutes a ward. The three outside walls of the wings consist largely of windows. Thus there is secured a maximum of air and sunlight. The pavilion is entered from behind. From the entrance passage a short projection northwards contains bathroom and lavatory accommodation. The intervening triangle between the wards and back passage serves as a nurses' room, where simple cooking or other special service may be arranged in the case of patients confined to bed. Opening off the passage also are two dressing-rooms for patients' clothes. No luggage or clothing of any kind is allowed in the wards proper.

Internally the wards conform in all respects to those of a modern isolation hospital as regards smooth surfaces, absence of angles, and unnecessary furniture. There are no steam or hot-water pipes in the pavilions. An open fire is provided. This is less for heating purposes than for the sake of a cheerful appearance and ventilation. There is no attempt made to keep the ward temperature

at any fixed point. It is deliberately allowed to approximate to that of the outer air. Lighting is by electricity. The windows are of French form, opening outwards, with swinging fanlights above. These are kept open to the fullest, constantly, both day and night. Thus the patient when indoors is practically as if he were in the open air. The cubic space per bed has been kept about 12,000 cubic feet. In view of the entirely free access of air, that amount might be lessened. About 100 square feet of floor area are allowed per bed. As each patient commonly has a bath daily, the number of bathrooms is considerable, one bath being provided for every four patients.

The adjacent pavilions are some 40 ft. apart. Each pavilion contains accommodation for eight to twelve patients. The pavilion is raised on pillars some 3 ft. above the ground, so that air may circulate freely beneath. The building material is of brick. Verandahs and balconies have been avoided, as tending to interfere with the entrance of sunshine and passage of free air throughout the building. The winged form of building is serviceable, as its sides afford shelter to weakly patients who may be allowed to lie out in front. Hinged screens may be attached to the end of the buildings, so as to afford further shelter.

In addition to the pavilion proper, open shelters are distributed in large numbers throughout the grounds. These are occupied by the patients most of the day, and many of them are similarly occupied by night. In a public sanatorium stationary shelters are, on the whole, advisable, distributed round the periphery of the park, so that they can be more or less governed from a central point. Such shelters should be shallow—only of sufficient depth to accommodate the width of a bed—say 3 to 4 ft. The roof should slope from behind, forwards and upwards, to prevent accumulation of stagnant air. In addition, the roof should be provided with skylight or ventilator. The roof and sides should be largely of glass. The shelters are entirely open in front. During wet and more stormy weather waterproof screens, which are readily attachable, afford sufficient protection.

The sanatorium should be provided with reasonably extensive private grounds, so that walking and other exercises, including games and the like, may be enjoyed with comfort. The planting of trees is advisable, to break the force of the wind, to aid in drying of the soil, and to serve as dust catchers.

In addition to the patients who reside for longer periods in the sanatorium—that is, until an effective cure has been attained—a certain number of patients are received at the Royal Victoria Hospital for day treatment, returning home at night. Where the patient's home conditions are sufficiently good, this arrangement has been found to work well. Thereby the extent of the sanatorium's operations is much increased and the excessive demand for admission somewhat relieved. Such an extension can be readily made to any hospital without serious outlay. Extra shelters and the cost of board are the only added expenses.

In this connexion it is worthy of consideration by the city whether a portion of some of the public parks should not be more freely provided with suitable shelters, where patients, more particularly in the early stages, might practise rational treatment on their own account. There seems no reason, indeed, why a *special* park should not be devoted to this, with a central dining-room, where suitable meals might be provided at cheap rates for such affected citizens, who in this way would be enabled to practise open-air measures in the fullest sense without inconvenience.

The value of the sanatorium has been increased at the Royal Victoria Hospital by allowing certain patients to use shelters, or other accommodation, over night, while during the day the individual pursues some calling outside the hospital. This ensures the advantage of medical supervision without the economic loss involved in more formal detention in hospital.

V. TUBERCULOSIS COLONIES.

The charge has sometimes been brought against sanatoriums that they tend to produce habits of indolence and idleness. I can conceive of conditions which justify the charge, but it is far from the truth in respect of properly-regulated sanatoriums. While sanatorium life is a life of treatment, it need not, and should not, be for the great proportion of patients an idle existence.

My idea of a sanatorium for the working class is that of a busy hive, where patients, subject to doctor's directions, contribute—some less, some more—by their own regulated efforts to the upkeep and beauty of the place—a kind of working colony. Thus, out of some 80 patients, presently under treatment at the Royal Victoria Hospital, approximately two-thirds do more or less to assist the institution. Of patients working an entire day there is a joiner, an engineer, a bath attendant, a laboratory assistant, two gardeners, and a groom and handy man. There is a regular corps of painters—some six or more patients—who work for a couple of hours in the morning and a like time in the afternoon. There is an infinite variety of minor engagements, such as raking, weeding, cleaning in various departments, and assisting in different branches of household work. In most instances the work, of whatever kind, is conducted outside. In the case of patients who work all day, suitable remuneration is afforded, in addition to their keep.

This is satisfactory so long as the patient remains in the sanatorium. But, as the time for his discharge approaches, a difficulty arises regarding the sort of life he should lead. Return to ordinary occupation is apt to be synonymous with relapse. It is on this account that, for many years, I have been endeavouring to create public interest in the establishment of working colonies for tuberculous patients in whom the disease has been arrested more or less completely.

After many inquiries I am satisfied that such colonies could be made practically self-supporting. The residents on the colony would be recruited by selection from patients whose disease had been successfully treated at the sanatorium. The reduplication of the double lines on the diagrammatic scheme (q.v.) emphasizes the close relationship which must exist between the colony and the sanatorium. The workers would remain at the colony under medical surveillance, and the character and amount of their work would be suitably gauged and directed. The produce of the colony resulting from the patients' labours would form an important supply for the sanatorium. Thus the two divisions of the scheme would work together conveniently and economically. Above all, a satisfactory solution of one of the ultimate difficulties in relation to the problem would be achieved.

CO-ORDINATION OF MEASURES.

This rapid review of the Public Aspects of the Prevention of Consumption may, I fear, have overstepped the usual limit of introductory addresses to your Society. If it has exhausted your time, I trust it may not have exhausted your patience. The subject is an immense one, covering, as it does, the conception, elaboration, and adoption of suitable measures, not merely for the limitation, but for the final extinction of tuberculosis. It has been possible for me only to present a sketch of what

appears to me the most effective plan of campaign. Let me add that, such as it is, it represents no hasty conception, nor does it rest on mere theory. It is the expression of convictions and opinions which have gradually taken shape while I have been occupied, close on twenty years, with the development of the various departments of the Royal Victoria Hospital and Dispensary for Consumption.

For the sufficient elaboration and maintenance of such a scheme it is impossible to trust entirely to individual effort or benevolent enterprise. It is essentially a matter for communities. If the issue be placed clearly before the citizens I am confident they will readily fall in with well-devised, comprehensive measures. It cannot be doubted that it is in the best interest of communities that sufficient measures should be undertaken, and the financial responsibilities involved must rest with the communities. The anti-tuberculosis organization should be more or less completely under the direction of the medical

officer of health. It should form, however, a separate, well-defined department of public health activity.

The accompanying extension of the previous diagrammatic scheme illustrates the relationship which should exist between the medical officer of health and the organization.

The medical officer of health must be in close touch with the hospital for advanced cases and with the dispensary. By means of these two arms he will effect a vast deal in the direction of prevention. Where notification is in operation the significance of the relationship will be enhanced. His connexion with the sanatorium and the colony may be less direct. None the less he will find both these factors of service, even from the preventive point of view.

It has been my endeavour to indicate the leading features of each factor in a scheme of organized and co-ordinated

operations against tuberculosis. It cannot be too strongly emphasized that the strength of such a scheme lies especially in its organization and co-ordination. Each factor is doubtless of value. Each department has its own sphere of operations. As isolated elements their possibilities are relatively limited. In proportion as the various departments are intimately connected and co-ordinated, they each become more serviceable. The key to complete success in the campaign against consumption lies in the harmonious co-ordination of well-directed measures.

REFERENCES.

- 1 The Organization of the Home Treatment of Pulmonary Tuberculosis, BRITISH MEDICAL JOURNAL, June 11th, 1904.
- 2 The Erection of Municipal Dispensaries and a Completer Organization against Tuberculosis, *Tuberculosis*, January, 1906, reprinted by the Local Government Board for Scotland as appended to their Circular (Public Health, No. 1, 1906).
- 3 Administrative Control of Pulmonary Phthisis.
- 4 On the Universal Applicability of the Open-air Treatment of Pulmonary Tuberculosis, BRITISH MEDICAL JOURNAL, July 23rd, 1898.

Diagrammatic scheme showing relation of Public Health Department to anti-tuberculosis organization.