if anything gives way. Mr. Lambie dealt with several subjects, but with great modesty he refrained from making any reference to an Act of Parliament known as the Public Health Amendment Act of 1891. It was an Act which the Lanarkshire County Council themselves saw through Parliament. It enables authorities to put a rate of 3d. per £ upon people whether they get a supply of water or not. It was only by the enterprise of the Lanarkshire County Council that the Act passed through Parliament as a public Act. Once it became a public Act it has been applied very usefully indeed. Several water schemes which could not possibly have been completed without it have been carried out through the operation of that Act. Another gentleman spoke about Mr. Frew glossing over a number of troubles and seemed to object to compensation water being given. It is ordinary practice that you have to pay for what you get. You cannot go and take water without providing compensation in some form, either in money or in water. Another gentleman went a stage further, and said that the amount of compensation prohibited a supply of water to a hamlet seven or nine miles away .I did not suggest that there should be such an amount of compensation, but I did suggest that a better supply would frequently be got when the local authorities were combined, as there is no doubt that combined authorities could have far better results with one good man giving a good deal of time as superintendent than if little places simply employed a local blacksmith or carter, at a possible remuneration of 25s. at New Year time, in respect of which he was expected to look properly after the works. I do not know whether I can say anything further except to thank you for the kind way you have received my paper. (Applause.)

DISCUSSION ON WHAT ARE THE MOST ADVANTAGEOUS ARRANGEMENTS TO BE MADE BY LOCAL AUTHORITIES FOR THE ISOLATION OF CASES OF LUNG TUBERCULOSIS.

By Dr. THOS. F. S. CAVERHILL, Edinburgh.

The PRESIDENT—Ladies and gentlemen, unfortunately Dr. Caverhill, who was to have opened the discussion on this subject, is unable to be here, but Dr. Cullen, convener of the Public Health Committee of Edinburgh, has kindly consented to read Dr. Caverhill's paper, and I now call upon him to do so.

Dr. G. MATHESON CULLEN—Mr. President, ladies and gentlemen, before I begin to read Dr. Caverhill's paper, I would like to direct your attention to the photographs which have been sent by Dr. Caverhill, and which have been hung on the wall. What he wants to show is the benefit of having sanatoria in a hill district, and not in the form of one large building, but in colonies of huts or chalets. There is here also a photograph showing how one can make a sanatorium at home. A gentleman in Roxburgh, after being at a sanatorium, could not sleep in his own house, and he constructed this small hut in his garden, where he has been sleeping for the last three or four years.

MR. PRESIDENT AND GENTLEMEN,—

I feel highly honoured by the request of your Council to open this discussion.

Since the issue of the circular on the administrative control of pulmonary phthisis by the Local Government Board of 10th March, 1906, the attitude of the local authorities has largely been one of expectancy, mainly due to the serious financial obligations likely to be incurred.

The difficulties are threefold. First, it is the first time the sections and the amended sections of the infectious clauses of the Public Health (Scotland) Act of 1897 have been declared by circular to be available for checking the spread of what is usually a chronic disease. In the second place, treatment with a view to the cure of the individual so that he becomes non-infectious is prolonged and expensive, and, in a large number of cases, impossible; and, thirdly, pulmonary phthisis is largely a social disease closely associated with a low standard of nutrition of the inhabitants, and with insanitary housing and surroundings. As the main objections to the adoption of measures for the suppression of pulmonary phthisis are financial, the problem we have to discuss to-day is (1) how to isolate cases of pulmonary phthisis so as to limit its spread in the most economical manner; and, secondly, how best to treat it so that convalescents from the disease can, without infecting others, be replaced in the ranks of the workers with every prospect of remaining there. It would be an outrage on popular sentiment and false economy if, by faulty methods, local authorities who are empowered to make a thorough cure only succeed in raising false hopes in the mind of the individual sufferer, teaching him in a sanatorium how to protect others from infection certainly, but never enabling him to realise his expectations of once more becoming a wage-earner, living and working without danger to others.

Many years' experience and observation have convinced me that local authorities cannot *by themselves* adequately and efficiently limit the spread of such a chronic disease without a serious burden on the rate-payers. At present, few phthisical wage-earners survive beyond a few months after cessation from work. They are mercifully released from their sufferings. If

they are now to be treated in sanatoria or by other methods of open-air treatment, the period of invalidism may be prolonged for many years. The danger of infection is slight, but it is continuous. As patients become weaker they get careless as to disposal of their sputum. They will then certainly infect others, especially young people after measles, whooping-cough, and other diseases liable to be followed by lung trouble. Pulmonary phthisis is one of the great causes of pauperism. We must see to it that, having put our hand to the plough, the phthisical patient is treated so thoroughly that, when convalescent, he will be able to maintain himself, and that he does not go to swell the number of the unemployed and unemployable, or to continue to be a menace to the health of those at home.

Patients who have undergone sanatorium treatment may be classed as follows:—

1. Those who have not improved.
2. Those whose lives are merely prolonged, but with tubercle bacilli still in their sputum.
3. Those who are able for light work of some kind, but cannot maintain themselves properly, and, owing to insufficient nourishment, they will have little chance of losing their bacilli.
4. Those who are able for full work, but have not yet lost all their tubercle bacilli, but will probably do so in time, if the conditions are favourable.
5. Those who are able for full work, and have permanently lost their tubercle bacilli.

In four of these classes the members are still infectious, so must be looked after by the local authorities as long as tubercle bacilli are to be found in the

sputum. It is not enough to say that every man has been given a chance of recovery in a sanatorium, and that, therefore, nothing more need be done for him. We must bear in mind that if he had been left alone he would have died in from six to eighteen months, but in teaching him sanatorium methods and the value of fresh air, we have given him a new lease of life, and with that the power of infecting others for many years, if bacilli are still present.

Miss Mudd, lady almoner at St. George's Hospital, London, informs me that, in her experience, wage-earners, with the exception of those living under favourable conditions, all died within two years after leaving the sanatorium if they were not supervised. My experience is not so unsatisfactory, but I am fully convinced that sanatorium treatment without "after care" for several months, according to the character of the individual and his surroundings, will fail to maintain the working power of a large number of convalescents.

If "after care," or helpful supervision, of the individual convalescent is of such importance in helping him to retain his working capacity, and to complete his cure, it is equally necessary to protect the other members of the family, especially when these are of tender years. The convalescent may become forgetful, careless, and indifferent in the disposal of his sputum, which, as I have already stated, in the majority of cases still contains tubercle bacilli. I have seen a patient with extensive disease return home fit for work after three months' sanatorium treatment, but with his sputum still infectious. He lived in a small house with a family of seven. For six years he has worked regularly in a factory, but in that time two of his children have succumbed to tuberculosis.

The local authority, therefore, while they use their

best endeavour to make an economic cure in the shortest time, cannot allow the patient to be absorbed into the family without taking steps to protect them as long as tubercle bacilli are to be found in his sputum. We thus see that, while "after care" is essential for the maintenance of the health of the individual, it is still more necessary for the protection of those living with him. Sanitary officials, lay assistants, and voluntary helpers will always carry public opinion with them, when they tactfully insist on the observance of those simple precautions that are necessary for the protection of others. This "after care" will be carried out by those specially qualified for such work by their kindliness and sympathy. They will be welcomed as friends, to whom the family will turn in times of difficulty and trial.

While great benefits will be conferred on the community at large and the individual sufferer, the ratepayers must be protected by the local authorities. They must provide safeguards against unnecessary expenditure. When public money is to be spent, it ought to be spent in the right way, at the right time, and for a clearly defined object. That is a truism, but it will prepare the public mind for those safeguards which are necessary in the public interest. Local authorities must seek to bring a sufferer from phthisis under treatment in the incipient or early stages, when effective treatment will be short and most likely to be permanently successful in ridding him of the infective agent—the tubercle bacilli in his sputum. Admission to a curative sanatorium must be only for those who are pronounced by experts as likely to be restored to health.

A patient does not, as a rule, leave the sanatorium free from infection. A sufferer from an acute

infectious disease, on the other hand, leaves the hospital a non-infectious person, but even if you send a phthisical patient to a sanatorium in the early stage of the disease, and he is kept under treatment for an average period of three months, his power of infecting others does not cease in a large proportion of cases. He is educated, certainly, how to protect himself and others, but the infectivity of his sputum, which alone entitles him to be called an infectious person, still remains in two-thirds of the cases after a three months' stay in a sanatorium.

Here are the figures for a large number of patients in eight working-class sanatoria in Germany. By the beneficent operations of the Invalidity (Infirmity) and Old-Age Insurance Act of 1891, over 12,000 patients were admitted in the first stage and kept under treatment for an average period of three months. At the end of that time only one-third had lost the tubercle bacilli in the sputum. When we consider that there is no incentive for a breadwinner in this country to enter a sanatorium except when he is no longer able to earn anything, that there is for him no separation allowance for wife and family as in Germany, and no subvention for twelve months after his discharge if unable to earn his living, you will readily understand that the number of cases in this country seeking admission in the first stage is by comparison small. In Germany two-thirds of the patients who enter sanatoria are in the early, curable stage; in Scotland there is only one-third. If two-thirds are admitted in the second and third stages for three months, the proportion that leave the sanatorium free from the power of infecting others by their sputum must be very small indeed.

Local authorities, therefore, must, with these facts before them, consider how far they are justified in incurring a large expenditure on sanatoria as places of

treatment apart from their educational value or as places of isolation. In the interests of economy and efficiency, as will be seen later, two kinds of sanatoria are necessary—one for educative purposes and for the isolation of advanced cases, costing about 22s. 6d. per week per patient; the other, a fully equipped curative sanatorium, which will cost 42s. per week for each patient.

Local authorities will not find it necessary to maintain patients in a curative sanatorium until they have got entirely rid of tubercle bacilli in their sputum. Many of these with bacilli have undergone an "economic cure," *i.e.*, they are able to maintain themselves at some kind of work; these will be in the majority. A small number at the time of their discharge will not have the power of infecting others. How long they remain so will depend to some extent on wage-earning capacity, food, occupation, and surroundings. Probably the chief factor for the maintenance of health, however, and the ultimate disappearance of the tubercle bacilli from the sputum in addition to helpful supervision will be the character of the patients themselves.

You will find that many patients come under treatment who have insensibly woven a cocoon of invalidism around them. If they are to regain and maintain health and strength, they must face life physically and morally renewed. They must leave their timidity and invalidism behind, and go back to work out their own salvation with courage and persistency.

Dr. Jane Walker writes of her experience in Norfolk—"In a sanatorium, men when well enough to work should not be allowed simply to loaf all day. Many of them, I regret to say, develop into the most confirmed grumblers. Men easily get accustomed to doing nothing, and also become so very careful of

their own health that, even when well enough to leave, they are often quite unfitted for their former work, and indeed seem prepared in some cases to go on happily living on charity for the remainder of their days."

These are notable words, the result of much experience by one of the pioneers of sanatorium treatment, a method of treatment, be it observed, where no opportunities for outdoor physical exercise or industrial occupation exists.

We do not yet know what practical result there may be from the visit of the Chancellor of the Exchequer to Germany in order to study the working of the Sickness and Infirmity Acts, but in the absence of statutory assistance we should try, I think, to bring about the co-operation of the sanitary authorities with private effort to cure the phthisical workers in any large numbers. In the meantime, friendly societies can do much. Their work is on the lines of our national character by stimulating notions of thrift, independence, and self-reliance. Mr. Lloyd George has recently said, when the question of pensions for the sick and infirm was being discussed in relation to old-age pensions, that it would be wicked to destroy our friendly societies. I would venture to suggest, in the absence of any national scheme, the formation in each county of a County Benefit Organisation Association in conjunction with the medical practitioners—a territorial system for the care of the sick and ailing in town and country. Such an association may reasonably expect a contribution from national funds, in addition to the subscriptions of its members, legacies, and other sums raised by public subscription. This association, if linked up with the local authority, could be charged with (1) the care and oversight ("after care") of cases of pulmonary phthisis, outside sanatoria; (2) the maintenance of wife and children in

the absence of the breadwinner in a sanatorium; (3) the training and supervision of cottage nurses and midwives in rural districts, as is now carried out by benefit associations in the counties of Peebles, Selkirk, Roxburgh, Berwick, and Haddington; (4) the supply of voluntary and lay health visitors in connection with the Notification of Births Act and to assist in reducing infantile mortality. As such an association would have unpaid canvassers, collectors, and other officials, the expense of which forms the great obstacle to the success of commercial institutions for sickness and infirmity, sufficient funds would be available for all these purposes with little expense to the ratepayers.

Curative Hospitals—Sanatoria.

While the choice of a site of an isolation hospital for advanced cases of pulmonary tuberculosis is not of much importance compared with accessibility to relations and friends, it is otherwise with the sanatorium. Here it is all-important. "The good is the enemy of the best," and a local authority, with their medical adviser, incur a great responsibility in this respect. The nature of the site determines the system of treatment; that in turn influences the mortality, fitness for work, permanency of cure, and the question of expense. We must bear in mind that treatment by drugs is discredited. Serum therapeutics so far do not afford us much help. A sanatorium is not merely an institution where abundance of good food and a little more pure fresh air are to be found; the patient can have that at home with little more than temporary benefit. Sanatorium treatment consists in the constant medical oversight of every detail of the patient's life, especially as regards diet, rest, and exercise. The treatment is a reversal of all medical traditions and practice, hence the need of special training and

experience of the supervising physician; as tuberculosis may affect any organ in the body, it is a great advantage, therefore, that he should have had general clinical experience as well.

The Site of the Sanatorium.

To get the best permanent results, the sanatorium should be erected in a hilly or mountainous region, where long, sheltered walks can be had, where there are no public-houses, and where the air is tonic and bracing throughout the whole year. Hill air is lighter, drier, colder, and purer. An experienced resident physician, trained in sanatorium methods, should direct the patients as to diet, rest, and exercise. In a small sanatorium he should not have more than from 25 to 30 patients under his control. I beg to submit for your consideration that a sanatorium organised in the form of a colony (detached villas, huts, and châlets), with accommodation for from 40 to 60 patients, is the most efficient. The resident physician should be adequately paid, and should live in a house at some little distance from the institution, where the healthy influence of home life is available. For that number an assistant is necessary, on account of the laborious observations now carried out in all fully equipped sanatoria. To enable local authorities or their medical advisers to judge of the soundness of these views, they should visit, and arrange for a short stay in, an institution organised on that model, and compare it with an institution on the "barrack" system, or with one where only prolonged repose in the open air is a characteristic feature of the institution, and where the patients seldom go beyond the gates. When possible, careful note should be taken of the permanence of cure of the ex-convalescents.

Local authorities must decide on three alternative sanatorium systems—

1. Prolonged hyperaeration, with or without constant medical supervision.

From the medical standpoint, this system is a discredited one, and need no longer occupy attention.

2. Prolonged hyperaeration, with industrial or other occupations under resident medical supervision.

This system is on its trial, and sufficient facts do not exist for forming an opinion as to its cost. Work is the best tonic for mind and body, and, in the case of the wage-earner, as soon as his condition permits, and even to promote the arrest of his disease, he should be put to work almost at once under strict medical supervision. It matters little what form of work he engages in as long as he is constantly supervised medically. In the case of a town patient it will be found that in most cases it is better that he should return to his own occupation when he returns home. He will work with greater comfort to himself, will make a larger wage, and will be able to feed himself better. Change of work for a grown-up man generally means the loss of a great part of his former wage. If a local authority is satisfied that unskilled labour, supplied by sanatorium convalescents, along with its supervision can be carried on without too great cost, it will be necessary to choose a site that affords opportunities for work, ready access to markets, and at a distance from towns, dust, travel, and public-houses. If a farm colony is thought advisable, great care must be exercised to avoid financial loss. It must not be forgotten that a farm labourer is a "skilled workman, and a successful farmer must have as much intelli-

gence as a solicitor." Farm colonies for epileptics, where the workers, as a rule, are more physically efficient, can only be carried on at great expense. If local authorities inquire into the cost of rescue, out-of-work, and epileptic colonies, it will be found that farm colonies would prove most costly methods of restoring consumptive convalescents to the ranks of the workers in our changeable climate. Should "intensive cultivation," after the French method, be proved to be a success in this country, it might, with less initial capital expenditure, provide occupation for a considerable number of convalescents. It is stated that by working three hours per diem from February to October a weekly sum of 30s. can be earned. Outdoor physical exercise alone, or combined with work that requires the minimum of skilled guidance and oversight and that involves little or no capital outlay, is to be preferred. Such conditions are to be found in the third system.

3. Graduated walking exercise, with hill-climbing, under an experienced sanatorium expert.

Here the patient, as soon as the fever subsides, has to walk a little every day. He leads practically an outdoor life night and day, winter and summer alike, and before he leaves he is able to walk 15 miles daily. He thus gains a capability and liking for regular outdoor exercise, the continuance of which is an essential factor in maintaining permanent good health. The aim of treatment is to arrest the disease, mainly, by hygienic and dietetic methods, and to strengthen the system of the patient so that the soil becomes unsuitable for the germ of tuberculosis. In such a sanatorium the patient becomes indifferent to weather conditions, he gains courage and acquires confidence in the method when he finds he does not catch cold.

Leading for several months an active, purposeful, occupied life, he does not readily fall into idle habits on his return home. Dr. Brehmer, the founder of the open-air system, regarded methodical hill-climbing as a factor of great importance in this method of treatment. Compared with the system mentioned in No. 2, it is much less costly, and the local authority runs no risk. This system of long walks and hill-climbing resembles railway traffic—the greatest profit is derived from the passenger traffic, where the passengers load and unload themselves. The other system is comparable to the goods traffic, which requires considerable capital expended in rolling stock; the goods must be loaded and unloaded by a large staff, and these require constant supervision. Whatever system is adopted, the institution must not be too large or insufficiently staffed, so that discipline can be properly maintained. The restoration of normal vigour is so complete, in the majority of cases, that, unless carefully supervised afterwards, patients often fall victims to overwork or undue exertion. Sanatorium treatment is only the first step; if arrest of the disease is to be completed or maintained, the patient should return to suitable work in favourable surroundings. In the Kelling Sanatorium, Norfolk, an "After Care" Association has been in existence for some years. The report for 1907 states —"Experience has taught that it is much wiser, if the medical condition allows, for a patient to take up his old work. . . . It is necessary for the patient's friends to have the question of his future employment in their minds from the very first. The cheering effect on the patient after knowing that there is some work to look forward to is very great, and it is absolutely essential that, after he leaves, he should not fall into ill-health again owing

to want of food. . . . The hard work of a farm labourer is seldom suitable."

In my experience, a small proportion of patients will go on to rapid healing after a short stay in a sanatorium at any stage and in any kind of sanatorium, but to obtain the best permanent results an average stay of five and a half months is necessary, under the constant personal supervision of a trained specialist. After getting accustomed to ordinary home life, with widely open windows, a patient may resume work, but for six months longer his life must be strictly on sanatorium lines as regards open air and the giving up of all social intercourse.

Isolation of Advanced Cases.

If a patient does not get the amount of fresh air to which he is accustomed, his condition rapidly becomes worse. One of the great advantages of the open-air system is that, if the person cannot be cured, he has the certain prospect of suffering less in the last stage of the disease than was possible under the old system of shut, or partially shut, windows and heated rooms.

If the local authority, therefore, takes over the care of an advanced case, they must place him in the most favourable position possible. He must not be hurried to his death. Every progressive physician at once adopts the open-air principle. If the patient is not cured, he gains enormously by getting "hardened" and accustomed to streams of current air. Cough and expectoration are lessened, his appetite improves. Place such a patient in the wards of a hospital which is not built on sanatorium lines. Immediately he descends to a lower level of health. His appetite becomes fickle, his cough and expectoration increase so much that cough mixtures have to be prescribed for his own sake as well as to prevent him disturbing others.

Wards or pavilions in isolation hospitals may, as a temporary expedient, be occupied by advanced cases of pulmonary tuberculosis who have not in their own homes been accustomed to open air, but local authorities at no distant date will find it economical to provide annexes or pavilions in connection with isolation hospitals to carry the open air principle into effect. The larger proportion of phthisical patients will be accommodated in these. The cost will be 22s. 6d. per week, as compared with 42s. in a well-equipped curative sanatorium.

In such specially-constructed pavilions or huts should only be received advanced cases (for which the accommodation must be more substantial), acute cases of phthisis with or without complications, whose home surroundings are unsatisfactory; those who cannot bear transport without risk, and those cases that are waiting for admission to a sanatorium.

In country districts especially cases for educational treatment could be sent there, and, after being trained as to the disposal of their sputum, and in habits of right living, for a period of from four to six weeks, they could return home to live or work under supervision either there or in a suitable hut (wood or iron) without danger to others.

Contrary to the experience at Brighton and in Lanarkshire, the resident physician (Dr. Downes) at the Bellefield (Glasgow) Sanatorium at Lanark, states that this method is not worth the money expended on it. That may be true, but no doubt such an unfavourable opinion would be modified if an "after care" association were in operation.

It can be readily understood that a home exclusively organised for incurable cases is a depressing place for both the patients and the staff, especially if they are young. Pavilions in connection with isolation hospitals

are more likely to be near towns and railways. In this way the patients will have more frequent visitors, and the staff will not be cut off from healthy social life. It is better to combine patients to some extent to prevent the institution being regarded as a "home for the dying."

Conclusions.

Isolation and Treatment.

Much unnecessary expenditure will be avoided if three aims are kept in view in providing isolation and treatment for pulmonary phthisis—

1. Early recognition of the disease when in its incipient stage, before the tubercle bacilli has appeared in the sputum. To wait for the appearance of the bacilli is to wait until the disease is far advanced.

Physical examination by the attending physician does not, as a rule, reveal the presence of the disease early enough to admit of its economical treatment. We must use new methods of diagnosis, such as Calmette's ophthalmo reaction. Local authorities can, at little cost, arrange for the Public Health Department applying these and other somewhat delicate tests to suspected cases.

2. The education of the people as to the necessity of seeking medical advice when a cough persists for some time, with or without loss of strength and weight. The curability of the disease when taken in time should be insisted upon. At present patients avoid calling in the doctor, as they do not wish to know the truth, which they are convinced is a sentence of death. This attitude will only disappear when each district or community can provide object-lessons in the way of patients fully restored to health and strength in a curative sanatorium.

3. That form of sanatorium treatment is to be

preferred which will not only rid the patient of his bacillary sputum in the shortest time, but will tend to the development of his character and self-reliance in his struggle against the disease.

Curative Sanatoria.

Ratepayers belonging to the upper and middle classes will naturally be sent by their ordinary medical attendants to private sanatoria at their own expense or partially assisted there by local authorities. Suitable cases amongst the wage-earners and those unable to afford the more expensive private sanatoria, would enter a municipal sanatorium, or one formed by the local authorities of, say, three or more counties with their contained burghs.

Great economy will be effected if local authorities provide wooden huts, in which convalescents from the sanatorium, with some force of character and fit for light work, might be placed at an earlier date than would otherwise be advisable for their dismissal.

In towns, a colony of huts in the grounds of the isolation hospital or other vacant space would provide accommodation for those even who are able to work but whose dwellings are unsuitable.

In the country a hut can be cheaply erected in the garden, in which a patient can live for years, while taking his meals with the family and working in the neighbourhood. Patients who have spent three or four months in a sanatorium prefer this to sleeping in the most airy house, even in winter. I can recommend this system as efficient and as most economical to the ratepayers.

Experience has proved that sanatorium treatment is disappointing as regards permanent results amongst *wage-earners* if—

1. The site of the sanatorium is badly chosen, preventing the patients becoming physically

fit either by long, sheltered walks and hill-climbing in all weathers, or by the want of some medically supervised form of work for some hours daily.

2. The air is not tonic and bracing throughout the year, especially in summer, so as to maintain a high plane of hygiene and nutrition.

3. The treatment is not begun early, or continued long enough.

4. There is no constant medical supervision by a skilled resident physician, continuously directing each patient as to diet, rest, exercise, or work.

5. If there is no rigid selection of cases by an expert.

6. The diet is not a special feature of the *régime*.

7. The institution is too large or insufficiently staffed.

8. The "after care," in the form of helpful supervision is not provided for.

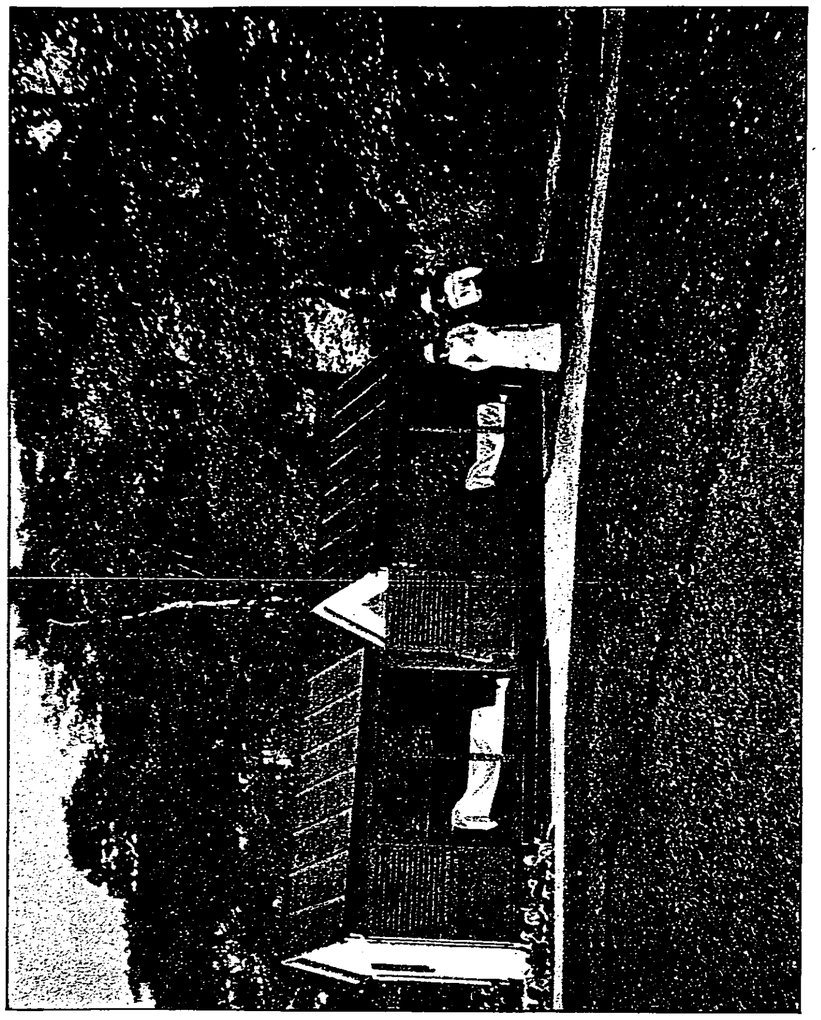
APPENDIX.

The Curative Sanatorium.—When roads, water supply, sewerage, and drainage are suitable, the cheapest sanatorium will be established by purchasing or getting on a long lease a mansion or other large house in a hilly country. The house must not be too old, and should not require much alteration or enlargement. Sufficient grounds should be available for the erection of wooden pavilions, châlets,

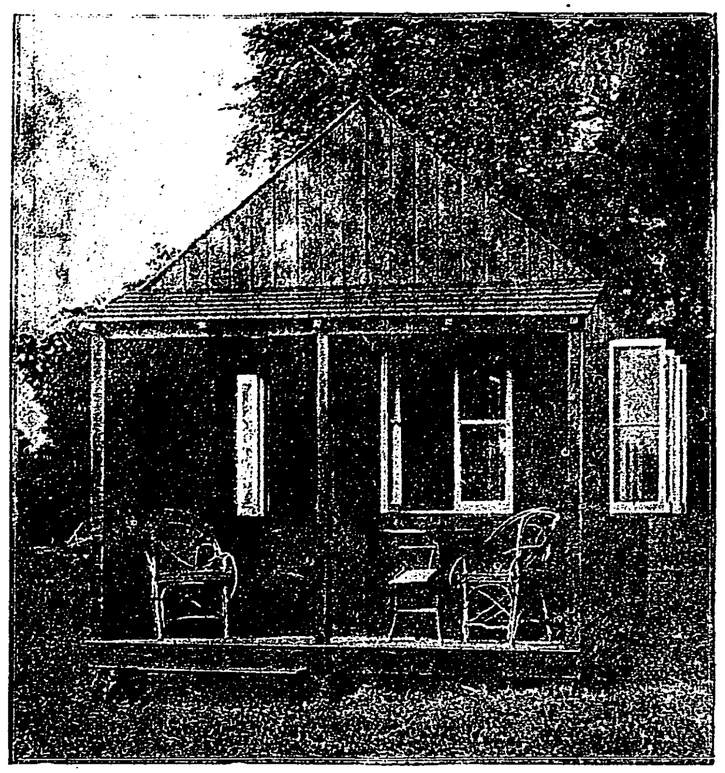
and huts. Such sanatoria may be seen at Bellefield, Lanark, erected by the Glasgow branch of the National Society for the Prevention of Tuberculosis. A sanatorium on these lines near Oban will shortly be ready for Argyllshire. At Manor Valley Sanatorium, Peeblesshire, may be seen a variety of accommodation in pavilions (stone), châlets, and huts. The County Durham Sanatorium at Stanhope cost about £3500 to provide forty-five beds. The house and grounds are held on an eighty-eight years' lease at £34 per annum. Blencathra Sanatorium, for the county of Cumberland, cost about £9000 for farmhouse, estate, and necessary buildings for 35 beds. At Nordrach on Mendip, Somersetshire, may be seen an efficient sanatorium on similar lines. It may be, and usually is, much cheaper to build a new house than to alter it structurally to any great extent. Economy in working and the saving of labour should be kept in view. For this purpose in preparing plans the services of a capable housekeeper or matron should be utilised to advise on every detail of domestic management.

Whenever a sanatorium has to be built on a new site the cost is considerable. That of Glenafton, New Cumnock, for Ayrshire and some of its contained burghs, may be visited. The administrative buildings are of stone, the wards, dining hall, &c., are of wood. Total cost, including ground, water supply, roads, drainage, &c., &c., with proposed extension for sixty beds, will be about £16,000.

Photographs of Glenafton and other economical sanatoria in Scotland, England, Germany, and America may be inspected (by the kind permission of the Local Government Board) at the offices of the Board, 125 George Street, Edinburgh, and at the offices of the Association, 83 Bath Street, Glasgow.



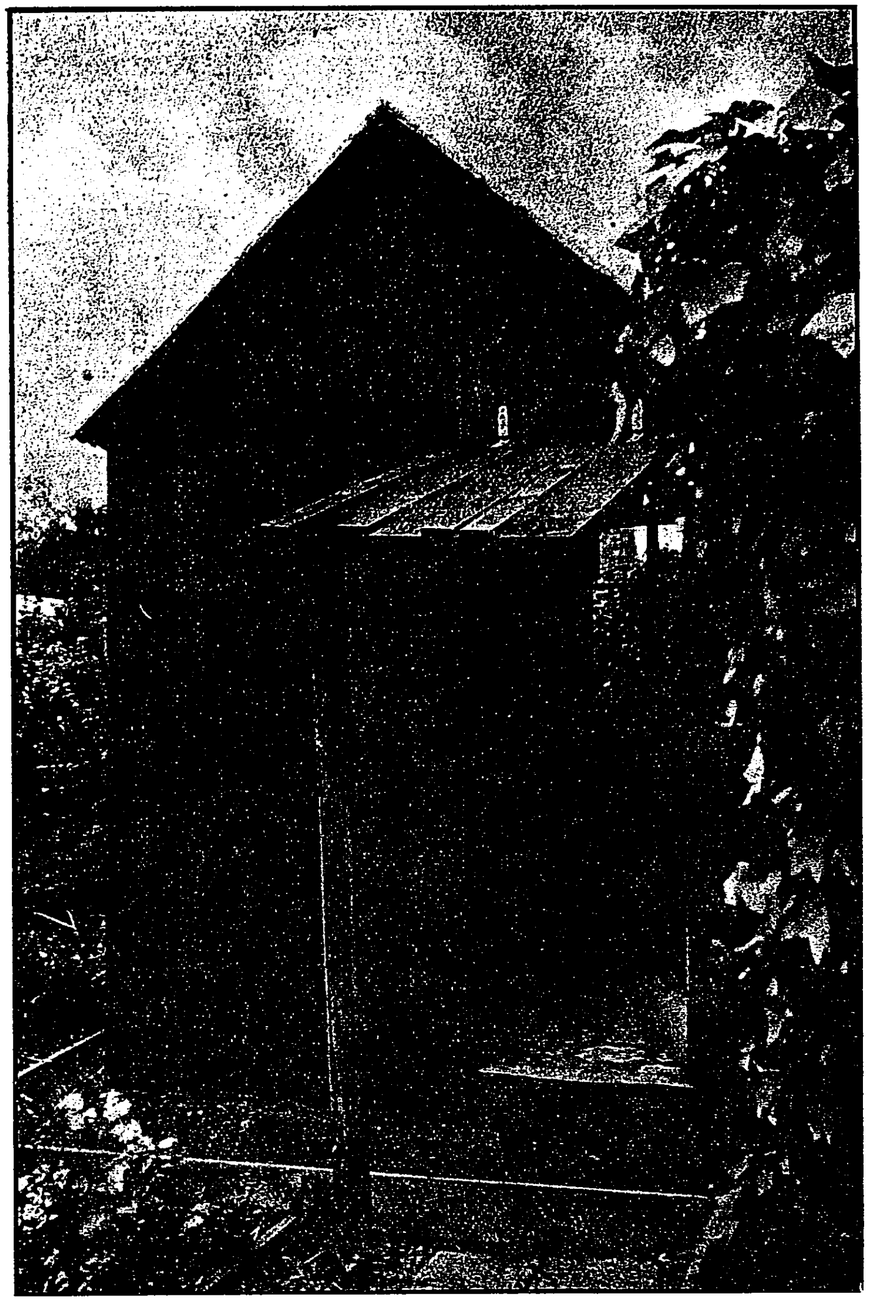
Sleeping Huts at Woodburn Sanatorium, near Edinburgh. Cost, £20; if made in sections, £22.
Dressing-room in each. A sheltered situation is necessary for this hut.



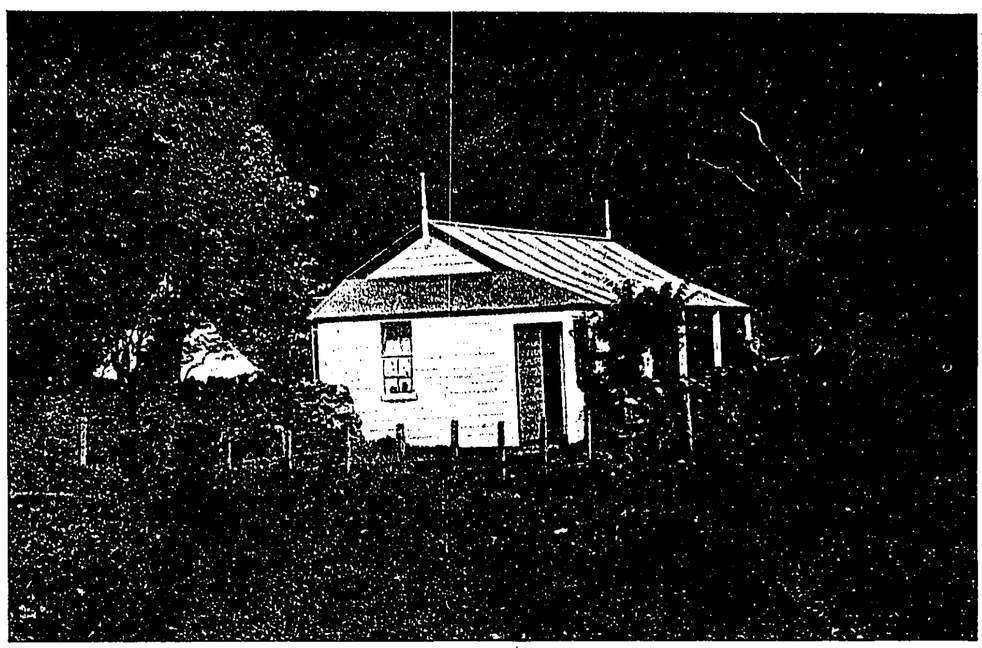
Single Hut; preferable to a double one, where they usually talk too much.

Cost £18. Double Hut costs £28.

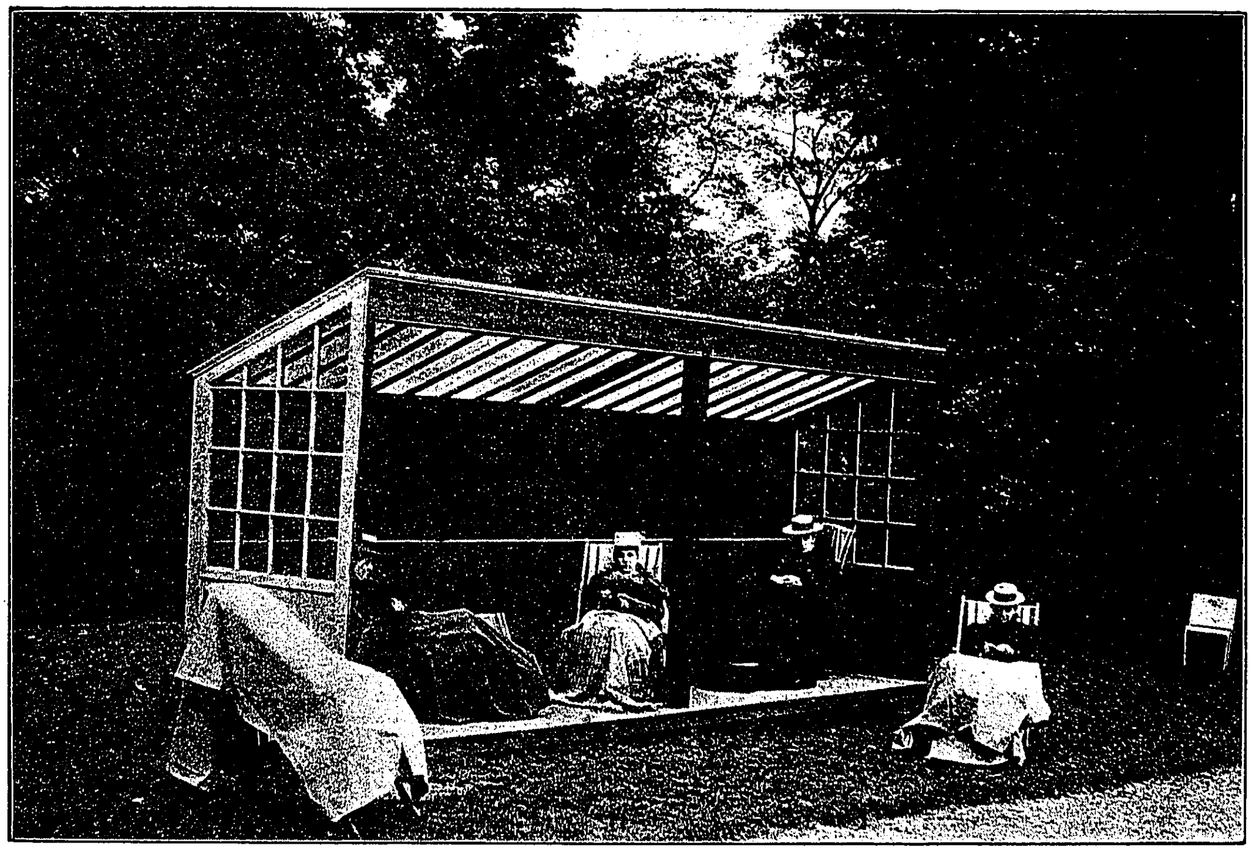
Back view of Single Hut.



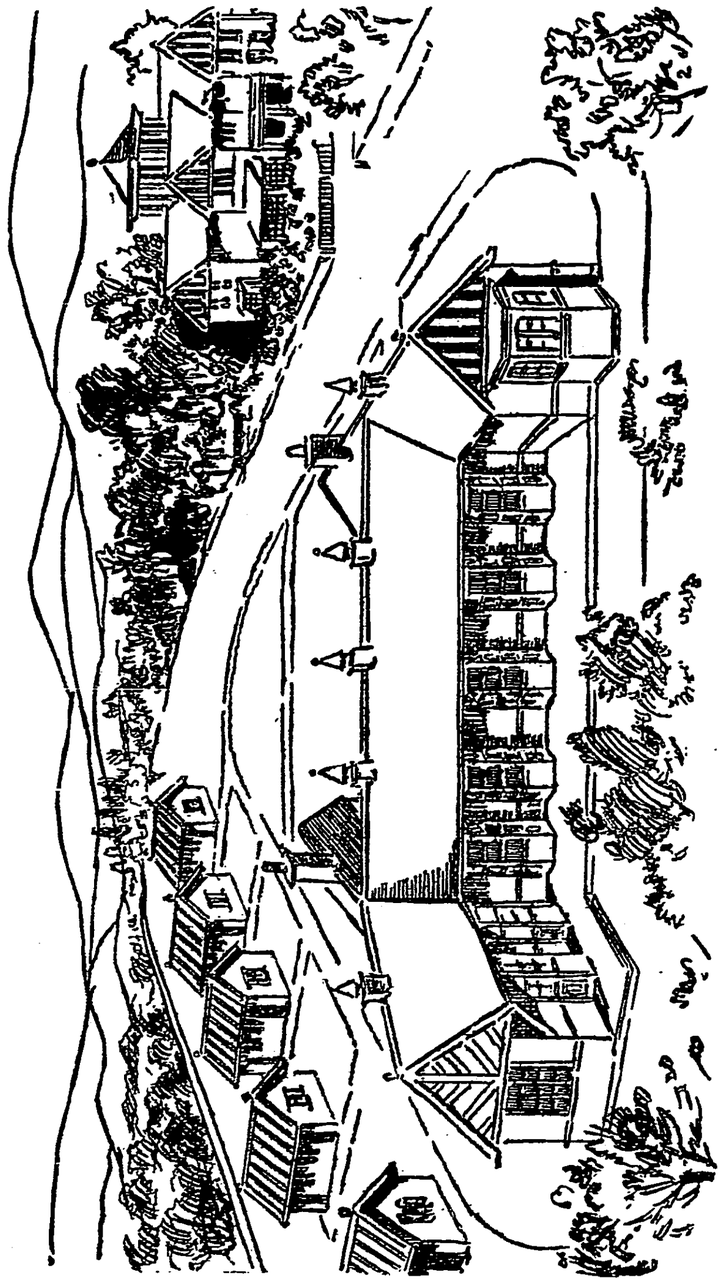
Hut in garden made by a patient. Patient, after 3 months' Sanatorium treatment, has slept in this Hut winter and summer for 3½ years—working full time and earning former wage; has never been off work; takes his meals and sits with his family. Family history bad. Hut should be raised 1½ feet to prevent rats and vermin working underneath.
8′ × 6′ × 10′



Manor Valley Sanatorium (Peebles) Châlet, four Beds and Bathroom. Cost, £110, on cement dwarf walls, weatherboard, and unlined Bedrooms. Most efficient for patients near the end of their stay.



Shelter or Sleeping Hut. Cost, £18. Royal Victoria Hospital, Edinburgh.



Bellefield, Lanark. Mansion-house on right, Wooden Pavilion, and Huts.

Discussion.

Dr. William Robertson (medical officer of health, Leith)—Mr. President, ladies and gentlemen, I am warned that I am only to be allowed five minutes, and, consequently, I shall be as brief as possible. We are all indebted to Dr. Caverhill for the excellent paper that he has submitted. It will afford local authorities scope for thought at the present time. I think Dr. Caverhill struck the keynote when he said that the main objection to the adoption of repressive measures centred round the question of finance. Local authorities have not had their attention properly focussed on any definite method of action, and perhaps the discussion may be the means of directing attention to this question and how it may best be tackled. We are confronted with the difficulty, first, of treatment, and, secondly, that of isolation; that is to say, we are desirous of getting what are known as early cases of phthisis for treatment, and, secondly, we are anxious to root out the spots where advanced cases of phthisis exist, which cases are capable of sowing a great deal of mischief. These, then, are the two problems which we have to face. Local authorities will be called upon to undertake the treatment of early cases, so as to rejuvenate and send them back capable of earning a living wage. That in itself is a big problem, and, as Dr. Caverhill has shown, it is not a question of residing in a hospital for twenty or thirty or forty days, but means the retention of patients for six or nine months. A great many people are buoyed up by the suggestion that they are to be made well by a brief course of treatment, but these are false hopes. In Leith we began the treatment of phthisis in 1904, and I can assure you that the hopes which were expressed by us have not been realised. Dr. Caverhill has quoted Brighton, and has also told you what the medical officer of Bellefield has said, and I agree with the latter when he says that the much-talked-of plan of taking phthisis patients for education for a short time to a hospital is scarcely worth the money expended upon it. You have to consider that most of the patients whom we take to our hospital for education come from the lowest ranks of society. You educate them for two or three months and send them back to the spot which has, perhaps, generated the disease. It is all very well to tell artisans that they must go into a better house, and must sleep in a room that no other person occupies, and they must sleep with open windows, but how is it possible for a working man living

in a small house to adopt these admittedly necessary precautions?

Dr. Ernest Watt (assistant medical officer, Lanarkshire)—Mr. President, ladies and gentlemen, in answering this question, I beg to briefly indicate the measures which have been adopted in the county of Lanark to deal with this subject.

In April, 1905, the county medical officer pointed out that voluntary notification and voluntary isolation of persons suffering from phthisis should, if judiciously carried out, prove acceptable and beneficial to the community, and also, owing to the limited prevalence of ordinary infectious disease, there were several pavilions in the infectious diseases hospitals, both in the Middle and Lower Wards, which might be adopted for that purpose.

In the following June the county medical officer was instructed to make the necessary arrangements for carrying out his suggestions, and voluntary notification was brought into operation by the issue of a circular letter to medical practitioners, and arrangements made for the admission of patients to hospital.

Under the method of voluntary notification so established it was found, as a rule, that cases were only notified where the medical practitioner desired removal to hospital, and that many cases were not notified until death was about to take place; consequently, it became clear that no control was possible over many cases which were a serious menace to their fellows.

Under these circumstances, it was felt that the necessary steps should be taken to make the disease notifiable under the Infectious Disease Notification Act, 1889. This was done, and the disease became compulsorily notifiable on 23rd December, 1907, for a period of five years, in the county of Lanark.

It is impossible yet to arrive at a comparative estimate of the value of compulsory over voluntary notification, but there is every probability that the local authority will obtain a more adequate idea of the existence of phthisis under the former than it will under the latter system, and will thus over a period of five years gain the knowledge necessary to deal with the subject in a thoroughly practical manner.

I purpose dealing only with the phthisis cases occurring in the Middle Ward District, as they form the greater proportion and are representative of the cases in the whole county.

During the period of voluntary notification from June, 1905, till December, 1907, 580 cases were notified in the Middle Ward District of the county of Lanark. Of these, 462, or 79 per cent., were admitted to hospital, and it is with this latter number that I purpose dealing in detail. I might also add that 8 per cent. refused hospital treatment.

The figures in connection with the cases since compulsory notification came into force are not yet available.

In order to have a uniform classification of the condition of each patient on admission to hospital the following has been drawn up:—

Stage of Disease on Admission to Hospital.

0. *Incipient.*—Slight physical and subjective signs, with history indicative of pulmonary tuberculosis. Spit, if any, contains no bacilli.

1. *First Stage.*—Definite physical signs of localised infiltration. Total involvment less than half a lobe, whether at one or more points. Cough present, and spit contains bacilli. Constitutional symptoms slight. In disseminated cases spit and bacilli may be absent, with constitutional symptoms more severe.

2. *Second Stage.*—Infiltration of single or multiple areas approaching or equal in amount to one lobe, or smaller area in stage of softening. Cough and spit, with bacilli. Constitutional symptoms severe.

3. *Third Stage.*—Infiltration in one or both lungs in excess of one lobe, or, if less in extent, the disease is in a stage of well-developed excavation. More severe constitutional symptoms.

A record is also kept in the Public Health Office of all cases discharged from hospital, and the subsequent progress of the case is watched and reported upon by occasional visits of members of the sanitary staff. This record shows that of the 78 cases treated in 1905, 36 were keeping well at the end of the year, 13 were well at the end of 1906, and 9 at the end of 1907. Two of the cases have kept so well that they may be considered as cured. The condition of other 30 patients is unknown, as they could not be traced, while of 4 who were traced their subsequent condition is also unknown.

Of the 155 cases treated in the following year, 57 were well at the end of the year and 38 at the end of 1907.

Here, again, it was impossible to trace 14 cases, but of the 19 cases that left the district 3 were keeping well, 2 being in Canada and 1 in Australia.

Of the 1907 cases, numbering 129, 1 patient was considered to be cured on discharge from hospital, although in the second stage of the disease on admission. At the commencement of 1908 we found that 80 of these cases were in fair health, that 33 had died, 4 could not be traced, and 12 had left the district.

Mode of Procedure as to Admission.—Unless the medical practitioner notifying a case requests that a visit is not to be paid by the sanitary inspector, the latter visits the patient's house and fills up a special form; hospital treatment is offered, and if a favourable answer is received the patient is admitted when a vacancy occurs. Similar methods of disinfection are adopted as in the case of ordinary infectious disease. At first all cases were visited by the medical officer, and instructions given to the friends as to the action to be taken for the preventing of infection, but owing to the increase in numbers this was found to be impossible, and special pamphlets are now left by the inspectors indicating the importance of avoiding indiscriminate spitting, &c.

Treatment in Hospital.—Though not specially constructed for the treatment of phthisis, the wards of an infectious disease hospital have been found to fulfil most of the conditions necessary therefor. In connection with three of the hospitals the ordinary ward pavilions have been augmented by special wooden shelters. These latter have proved very useful, especially during summer weather, and in some instances have been in constant use for sleeping in from the month of February until the month of November in each year. A minimum residence of three months is aimed at for each patient, but in many instances this cannot be achieved owing to the impatience of the patient. In addition to the efforts made to improve, or, if possible, to cure each case, he or she received explicit instructions as to how best to avoid the conveyance of infection to the healthy.

Expenditure.—In only one hospital has an actual cost per phthisis patient been determined, as in the others it was not possible to keep the expenditure of these separate from that of the ordinary infectious disease cases. Taking an average duration of 75·5 days, each patient costs nearly 35s. per week. The hospital under discussion is one of the

smallest in the county, and consequently the working expenses per patient are probably greater than is the case in the larger institutions. When one examines the details of the "treatment" this is a very modest sum. Each patient discharged possesses the potentialities of inculcating "preventive" methods among the afflicted brethren, and thus during a period of years this knowledge is bound to more and more become common property among the masses. Not merely so, but such as have derived marked benefit or cure by the treatment will encourage earlier and more suitable cases to apply for treatment. Since the inauguration of the admission of phthisis cases to the infectious disease hospitals throughout the county it is gratifying to be able to say that only on three occasions has this required to be stopped for a brief period owing to the prevalence of ordinary infectious diseases.

Finally, I might remark that (1) pulmonary tuberculosis is not now looked upon as being so hopelessly incurable as formerly if treated early; (2) its infectivity is being more and more recognised; (3) its treatment does not necessarily require the construction of elaborate and expensive sanatoria, unless it be to satisfy the tastes of the richer patients, nor does success therein depend so much upon climate as was at one time thought; (4) owing to the independent spirit displayed by a certain and not negligible proportion of phthisis patients it is at present impossible to isolate all the cases for a sufficient length of time to prevent every possibility of infection; (5) we must not hope to grasp the whole subject immediately, but unquestionably our efforts, as above outlined, are bound to ultimately lead to a marked diminution in the incidence of pulmonary and other forms of tuberculosis.

The PRESIDENT—Ladies and gentlemen, the subject of the treatment of phthisis presents itself to me under two aspects—the preventive and the curative aspects. The question of treating the individual by sanatorium treatment in the ordinary sense of the term has not been undertaken by any municipality, and the reason for that is very probably the great expense which it is supposed to involve. For my own part, I do not think that this expense need be such a bugbear as is imagined, for I think that the capital expenditure of a large sum of money on sanatorium premises is quite unnecessary. (Hear, hear.) I am quite sure that a very much cheaper and simpler and quite as effective kind of sanatorium can be erected for municipal purposes at very

much less money than has yet been done. (Applause.) I think the extravagance in upkeep can also be very much curtailed, but there is only one matter that has not been referred to at all, and that is the exceedingly important method of combating pulmonary phthisis, especially in the case of large towns, by the establishing of municipal dispensaries, such as is recommended in the Local Government Board circular. I think that we in Dundee are the only people in Scotland who have a municipal dispensary, and I can speak to the excellent work that has been done in connection with that dispensary during the last eighteen months. Now one of the advantages of such an institution is that you get there the very kind of cases that you are looking for—the incipient cases. People come there who do not dream that they are suffering from phthisis. They come to get their chests examined in many cases, and you find the disease in the very earliest stages at which it can be diagnosed. In connection with our dispensary, through the generosity of three friends of my own, I got a sum of £600, so that I might have the use of beds in our sanatorium for two years. This sanatorium is not a municipal one, but built by the generosity of one of our citizens at a cost of £25,000—an absolutely unnecessary expenditure. It is a beautiful sanatorium, but two-thirds of the money could have been saved in the building and the rest put to endowment. That is by the way. We have found during the past eighteen months in which the sanatorium has been open that up to the end of the year, out of 16 cases that were sent out there in the early stage of phthisis, 12 were discharged with a residence of three to six months, and in every instance the disease was arrested. That is to say, these patients left the sanatorium trained in sanatorium methods and no trace of the disease. The temperature remained normal, and the tubercle bacilli had disappeared from the sputum in every case. One does not expect cases of that kind. The cases were good cases for the purpose, and they all did well, but in connection with a phthisis dispensary the great advantage is that it costs little. With us the dispensary is worked for about £200 a year. I may explain that we have the use of the out-patient department of the infirmary three hours a week, but, apart from that, the cost is under £200 a year. We have a physician who attends there three times a week, and a nurse trained in sanatorium methods who devotes her whole time to visiting the whole of these people who

come to the dispensary for treatment, and who sees that the injunctions they get at the dispensary are carried out as far as possible at home, and who instructs the occupants of these houses on the necessity of fresh air and cleanliness and so on. I am quite convinced of the enormous amount of good which such a measure is bringing about, more particularly the work which the nurse does in connection with the dispensary, both from a preventive and a curative point of view. I think the work is exceedingly valuable. Much, of course, depends upon the person you get to do that work, and we in Dundee have been exceedingly fortunate in the official who undertakes it. I simply wanted to point out that in my opinion the question of expense in combating pulmonary tuberculosis need not loom so largely as some people think—as many municipalities think, at any rate; and now that this subject has got to be tackled, local authorities must make up their minds how they are going to do it. I think it is very important that we can decide to do so in an economical manner, and at the same time adopt the most effective method of doing it. (Applause.)

Dr. E. E. Prest (Manor Valley Sanatorium)—Mr. President, ladies and gentlemen, there are just one or two remarks that I should like to make about sanatorium treatment for patients. You have got to remember that we have to consider the results obtained from patients about ten years ago, before any serious treatment at all was attempted. In those days a patient was not encouraged to lie in bed. He was allowed to walk out with his overcoat on, and although daily getting worse was still encouraged to keep about. Then the sanatorium treatment came along, and as the man was taken from his work and anxieties, good results might be expected to be got from that. And a certain amount of good results are obtained, but though, to a considerable extent, due to the open air and to the food, it is chiefly due to the rest—this rest may be only comparative, but, in any case, the only thing that will cure is to keep the patient in bed till the temperature falls. What I wish to say chiefly is that there is a good deal of talk about giving people work to do in sanatoria. That is an excellent thing to do, provided that they are well on their way to a cure before they begin—that is to say, they must not have any fever if they are going to work. At Frimly Sanatorium, in the south of England, where they have about 100 patients, they draw them from the Brompton Hospital, which has 320 beds and a

large number of out-patients. They are thus able to obtain suitable cases, having watched them previously in the hospital. This, however, is not treating consumption as met with in consecutive cases. They are thus able to take the suitable cases under treatment, and those which have got any fever are kept in the hospital. They are then sent out, and they work, and, of course, it does them a great deal of good. The disease is then practically arrested, and they are trained to go back to their ordinary occupations. With regard to diagnosing these cases there is one thing that seems even now not to be quite realised. If a man spits blood, as a rule you may assume that he has got phthisis. I have traced cases of six or seven or eight years' duration which have remained well after bringing up as much as a pint of blood, though ultimately a considerable proportion of these cases develop extensive disease, and become past hope of recovery. Some of these cases have often no fever, and they can be sent out to walk at once. In all cases of pleurisy it is as well to take three months in a sanatorium, and in these cases work may be found for them, but any patient who is really bad cannot work. These people do not feel inclined to work; they are ill. There is a tendency to think that people who have got consumption are not really ill, but they are; they feel bad, and therefore I give a warning. I may be wrong, but I have a suspicion that to err on the side of giving rest is much safer than to err on the side of working. I think that is all I have to say. In advanced cases the old-fashioned way was probably not so bad, because really advanced cases of phthisis cannot stand to be exposed to the open air in winter, so that the old physicians were not so mistaken as is sometimes thought.

Dr. THOMAS F. DEWAR (medical officer of health, Fifeshire)—Mr. President, ladies and gentlemen, I read the other day, with a great deal of interest, a statement about leprosy in Norway, and it seems to me that it might be interesting to you. We are all, no doubt, aware of what is passing in the minds of experts to-day, and we have heard from Dr. Robertson an able account of the difficulties and disillusionising which those who are working practically with phthisis meet with. As the result of all these things the confidence which was everywhere met with two or three years ago has somewhat given way to an air of doubt—almost of heart-searching—and I think, therefore, it is encouraging for us to look at what has happened in Norway during the last quarter of a century. In Norway at the commencement of that time there still lingered the disease of leprosy, which had been stamped out of other parts of Europe. The Norwegians about twenty years ago passed an Act which, first of all, made it compulsorily notifiable; secondly, compelled isolation; and thirdly, provided for raising by the rates the means of isolating in hospitals. Well, they found out that they could not compel isolation to begin with owing to the want of hospital accommodation; but soon after they made the very satisfactory discovery that compulsion was not necessary, and now, within a quarter of a century, leprosy has very much diminished, and bids fair to be stamped out within another decade. In Scotland four or five hundred years ago leprosy was *the* disease of the people, just as tuberculosis in one form or another is to-day; but no sooner did the people rise to the importance of its treatment than the disease began to diminish, and within a century or two it was stamped out. The argument from analogy is somewhat unsafe, but still there is here a source of encouragement to us to set about active measures for the control of tuberculosis.

Bailie DISHART (Kirkcaldy)—Mr. President, ladies and gentlemen, I am not a medical officer of health; I am not even a medical man nor a sanitary inspector, but I just wish, as a member of a local authority, to support what has been said very ably by Dr. Templeman in regard to the expense of a sanatorium in the small towns. I think the expense is not so great as many suppose, and on that ground I have reason to say that in the town which I represent, with a population of about 38,000, we have erected a sanatorium costing about £2000. It is very beautifully situated and well equipped, and is a very suitable place. It was designed by our sanitary inspector, and it is just finished; it is being furnished just now, and has accommodation for 14 or 16 patients. The site is not on a hillside, and it is not far from the town, but we considered it both suitable and convenient. In the case of a father or mother ill with phthisis living in a one- or two-apartment house, with four or five children, it will enable us to remove the patient to the sanatorium and save the children. It will also be of great service in giving useful information to patients as to how they may protect themselves and their friends when they return to their homes. I am quite satisfied that it would be a decided advantage to many of our local authorities if, instead of sending one or two representatives to the

Sanitary Congress, they sent half a dozen to hear what is said. I remember when the Sanitary Congress visited Kirkcaldy it did more for the education of the general public in matters affecting the health of the people than anything that had happened for many years. I think it is reasonable to expect that towns of a similar size to Kirkcaldy should make an effort to erect a sanatorium, when it is evident that a suitable building can be erected at a very small cost.

Mr. Baile Bennett (Greenock).—Mr. President, ladies and gentlemen, I had no intention of speaking this morning when I came here, but I just rise to say that I am somewhat disappointed at the direction the discussion has taken. In the first place, I would like to say—and I feel sure I speak for all municipal representatives present—that as such we have all an earnest desire to do what is our duty to those who are suffering from this deadly disease. At the present time all municipal authorities throughout the country have under consideration circulars from the Local Government Board. We have a great reverence for that Board, and we try to carry out their wishes to the best of our ability. We sometimes have an idea that, as expressed in their circulars, they are somewhat oppressive and somewhat expensive. I was expecting to-day to hear the various speakers directing their attention more particularly to these various circulars that are here stated to be the outline of the paper to-day, namely, the circulars issued on 10th March and 13th July. I do not know whether it is my dulness or not, but I think the speakers have not directed their attention particularly to these various subjects. I know that remarks have been made in the direction of personal treatment of cases by education in their own homes and by visits from qualified officials, and I appreciate very much the remarks of our respected President with regard to what has been done in Dundee. As a representative of the people, I would like to see our officials agreed upon a particular course of action in advising us as to the method we should adopt. That, I think, would answer the question put by Dr. Robertson, what are the local authorities prepared to do in the matter? I think if they would, first of all, clearly state in a united way what they would advise us to do in the matter, then the local authorities, I think, would have some clear notion as to their financial responsibilities, and give them a very quick answer. (Applause.)

THE MILK SUPPLY OF THE COUNTRY, WITH SPECIAL REFERENCE TO PROSPECTIVE LEGISLATION.

(*a*) From the Point of View of the Local Authority in a Burgh.

By G. MATHESON CULLEN, M.D., B.Sc., Convener of the Public Health Committee, Edinburgh.

The President—The procedure in this discussion will be that the papers will be first submitted by the three gentlemen who have undertaken to open the discussion. Then the discussion will proceed on the usual lines, and at the close the resolutions which have been submitted by Dr. Campbell Munro will be taken up.

The vital importance of our milk supply does not require any elaborate argument, especially at such a Congress as this. Milk is a perfect and complete food, and enters largely into the dietary of all. In young children and in many diseases among adults it is the only, or, at all events, the principal, article of food. The amount consumed is therefore enormous. Some 150,000 gallons are daily brought into London alone, and this is equivalent to between 50,000,000 and 60,000,000 gallons per annum. From abroad we get an amount of condensed milk every year, which is said to be equal to 250,000,000 gallons, and, in addition, we import an increasing quantity of fresh milk. Of this latter commodity the amount brought to our shores for the nine weeks ending with the 1st of February, 1907, was 94 cwts., while at the same period in 1908 it had risen to 499 cwts.

The nature of the lacteal secretion is such that,