On the prevention of consumption : a report.

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ON THE

PREVENTION OF CONSUMPTION

A REPORT

TO THE

RIGHT HONOURABLE THE LORD PROVOST,
MAGISTRATES AND TOWN COUNCIL

OF THE

CITY OF EDINBURGH

BY THE

PUBLIC HEALTH COMMITTEE

EDINBURGH: PRINTED BY TURNBULL & SPEARS
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RECOMMENDATIONS BY THE MEDICAL FACULTY OF THE UNIVERSITY OF EDINBURGH, THE ROYAL COLLEGE OF PHYSICIANS, AND THE ROYAL COLLEGE OF SURGEONS, SUBMITTED AT THE REQUEST OF THE PUBLIC HEALTH COMMITTEE . . . 118

INTRODUCTORY.

On 11th October 1898, the Town Council was pleased to remit to the Public Health Committee as follows:—"That, "having regard to the opinions now maintained by leading "medical men that Consumption is an infectious and prevent- "able disease, it be remitted to the Public Health Committee "to consider whether any, and what, steps ought to be taken "by the Local Authority to protect the public against the "disease in Edinburgh, and to report."

In fulfilment of the remit, the Public Health Committee sought to survey the whole subject from the practical and administrative point of survey. There has, of course, been no intrusion into the purely medical departments of the subject. At the same time the utmost regard has been shewn to the pronouncements of leading medical men, whether as practitioners, bacteriologists, or pathologists, so far as they have arrived at agreement upon the results of recent discoveries. It has been felt needful to set forth with considerable fulness the present state of well-attested knowledge regarding the disease. This has been done even at the risk of reiterating facts that are now familiar to many people beyond the domain of the medical profession; yet, it is hoped, in such a manner as only to include matters that should be within the range of common knowledge, but especially of all who are in any way responsible for the care of the public health.

The Public Health Committee on 18th October 1898 appointed a special Committee of their number consisting of the following members, viz., Bailie (now Judge) Pollard, *Convener;* Judges Sir James A. Russell and Sir Andrew M'Donald; Councillor (now Bailie) Forbes Mackay, Councillor (now Bailie) Wm. S. Brown; Councillors John Mallinson, Robert Menzies, W. Lang Todd, John Jamieson, J. H. Waterston, and William Williams.

The Special Committee was instructed to call for reports, make enquiries, and hold conferences as might be deemed advisable. In order to have a clear view of the prevalence of the disease in Edinburgh, the Committee requested Sir Henry D. Littlejohn, Medical Officer of Health, to frame a report setting forth the annual mortality from consumption, the sex, age, dwelling, rental, and occupation of all citizens who had died of the disease during the year 1898. This most valuable state-

ment, which was circulated among members of the Town Council, has been brought down to 31st December 1899, and will be found in the second part of the Report. The Committee also invited a Conference with representatives of the Medical Faculty of the University, the Royal College of Physicians, the Royal College of Surgeons, and the two Veterinary Colleges of the City. This Conference was held on 9th February 1899, and was duly reported. The Committee was subsequently favoured by the medical bodies referred to with a statement of Recommendations. The Report of the Conference and the Recommendations are also embraced in Part II. Advantage has been taken as far as possible of all other sources of information open to the Committee, and ample use has been made of the recently published records of the International Congress on Tuberculosis held last year in Berlin, at which the latest and most accurate information was communicated by the highest authorities.

It has been thought that the present report could not be presented in more intelligible form than by following generally the order in which the whole question was exhaustively treated at the Congress just mentioned. Accordingly the main parts of the Report are: (1) The Origin and Nature of Tuberculosis; (2) Extent and Distribution of the Disease; (3) Its Communicability; (4) Its Preventability; (5) Its Curability; and (6) Municipal Duty towards its Extirpation.

It is impossible to name all the workers in this great subject, whose labours have been used for the purposes of this Report. Some of them will be referred to in the text, but special acknowledgments for direct assistance are due to Geheim Medizinalrath Doctor and Professor Robert Koch, Geheim Medizinalrath Doctor and Professor E. von Leyden, Ober Stabsarzt Dr Pannwitz, General Secretary of the International Congress on Tuberculosis, Berlin; Dr A. J. Martin of the Assistance Publique, Paris; Dr Hermann Biggs, Public Health Department, New York; and also to Dr John Tatham, Assistant Registrar-General, Somerset House, Dr J. B. Russell, late Medical Officer of Health of Glasgow, now of the Scottish Local Government Board, and Dr Arthur Ransome, whose Weber-Parkes Prize Essay is one of the most informing treatises on consumption that have yet appeared in our language. It is hardly necessary to say that the most active and hearty co-operation of Sir H. D. Littlejohn has been at the constant service of the Committee.

In name of the Special Committee,

JAMES POLLARD, *Convener.*

PART I.

PREVENTION OF CONSUMPTION.

1. ORIGIN AND NATURE OF TUBERCULOSIS.
2. EXTENT AND DISTRIBUTION OF THE DISEASE.
3. COMMUNICABILITY OF CONSUMPTION.
4. PREVENTABILITY OF CONSUMPTION.
5. CURABILITY OF CONSUMPTION.
6. THE DUTIES OF MUNICIPALITIES TOWARDS ITS EXTIRPATION, WITH RECOMMENDATIONS TO EDINBURGH TOWN COUNCIL.

PREVENTION OF CONSUMPTION.

There is no problem affecting public health at the present day that fills the mind with a larger hope than the Prevention of Consumption. That hope is inspired by the discovery of the true cause of Consumption by Professor Robert Koch eighteen years ago, and by the knowledge which that brilliant achievement has revealed. Until within those recent years Consumption was looked upon by most people with despair. There are few persons over forty who cannot recall the sinking of heart with which the news was received of some friend or relation having been declared to be suffering from phthisis. If the patient could command means, he might seek improvement by sailing over sunny seas or by residence at health resorts in milder climates. Perchance he might return fit for the ordinary duties of life. If he were poor, he struggled on for daily bread with gradually diminishing strength, his means lessening as his need grew greater, until the unavoidable end arrived. Thus the common everyday experience yielded fresh testimony to the French aphorism—Consumption is a disease from which the rich are *sometimes* cured, the poor *never*. No doubt the teaching of the dissecting-room had revealed to medical men that in some way or other recovery must be possible. Demonstrations were frequently given in post-mortem examinations that the lungs of deceased persons showed distinct traces of healed consumptive wounds, the death having been brought about by a wholly different cause. A better knowledge of the sanitary conditions that lessened the ravages of the disease was also obtaining possession of men's minds. In 1865 Villemin had shown beyond dispute that the disease could be communicated by means of sputum from one person to another, while a leading authority had declared only ten years earlier that consumption could no more be communicated than a fractured limb could be. Its amenability to the influence of fresh air and regulated exercise led to the foundation in 1854 of the first German Sanatorium for Consumption by Dr Brehmer

at Görbersdorf in Silesia. Results were obtained by Dr Brehmer that showed how much could be gained by attention to the natural laws of health in cleanliness of the person, the food, the home, and the atmosphere. It was shown, indeed, that Consumption, like so many of the common febrile diseases, is fostered by dirt and is destructively affected by every influence that makes dirt its foe.

But as to the actual cause of the disease, whether it was a hereditary taint of blood or formation of body, whether it was caused by dead matter, or by a spiritual influence, ignorance prevailed until the actual microbe itself, the bacillus of tubercle, was brought into the light of day by the tireless labour and genius of Koch. In order to give a clear idea of the organism it is presented on Plate I. in four very distinct micro-photographs specially obtained for this Report from the Directors of the West of Scotland Clinical Research Laboratory. The photographs illustrate some of the typical pathological conditions under which the tubercule bacillus may be met.

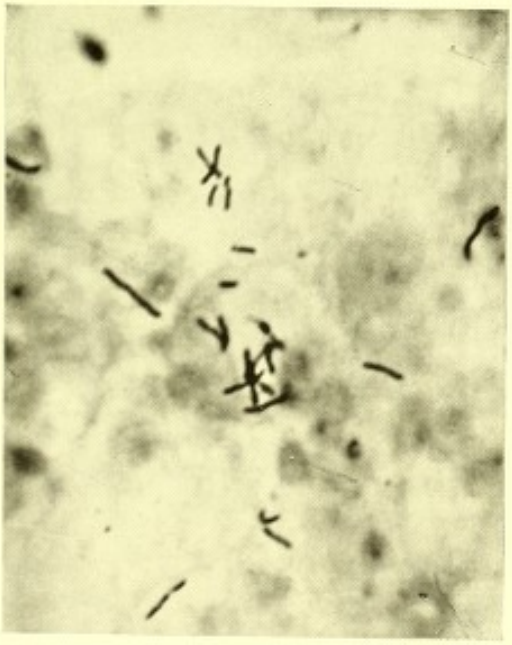
PLATE I.

MICRO-PHOTOGRAPHS TO SHEW THE ORGANISM OF CONSUMPTION IN DIFFERENT SUBSTANCES.

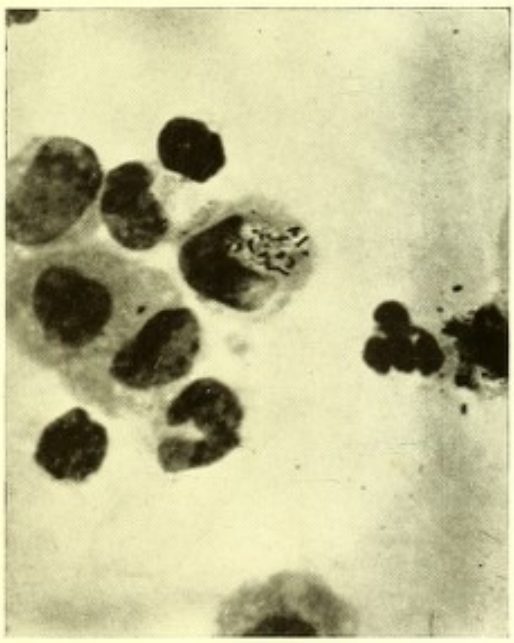
(Specially prepared for Edinburgh Public Health Committee's Report on the Prevention of Consumption.)

1. Specimen of Tubercle Bacilli in Milk (× 1000).
(Mounted and stained by Dr Carstairs Douglas.)

2. Tubercle Bacilli in Sputum (× 1000), from case of ordinary pulmonary Phthisis.
(Mounted and stained by Dr Carstairs Douglas.)



3. Tubercle Bacilli lying in the tissue of a tubercular gland (× 2000).
(Mounted and stained by Dr Leslie Buchanan.)



4. Tubercle Bacilli lying inside a phagocyte or white blood corpuscle (× 1000).
(Mounted and stained by Dr Peter Paterson.)

I. ORIGIN AND NATURE OF TUBERCULOSIS.

What then is Consumption? To this question we can now give a clear and definite answer. It is a disease caused by a living organism, the bacillus of tubercle, that produces a poison which breaks down and kills the tissues in which it finds its home. That is the sole cause. There can be no consumption where there is no tubercle bacillus. The bacillus is not born with us, it comes to us from without. It may come in milk or in other food, it comes most easily from the spit of diseased patients drying and passing into the air in the form of dust. This same dust may lodge in the walls or wall-paper of our dwellings, and while it will not spread there, it may remain alive and a source of infection for long periods. Consumption or tuberculosis takes many forms and has several names. The germ sometimes appears in the membranes of the brain and there produces water in the head. When it attacks the lymphatic glands of the abdomen, it produces the form of consumption of the bowels, that carries off multitudes of children. If it attack the superficial lymphatic glands, especially those of the neck, it develops the disease known by the familiar name of King's Evil or Scrofula. When it attacks the skin, it causes the distressing disease called Lupus. It also takes scrofulous characteristics when it finds, as it so often does, a lodgment in the joints and softer bones of the body. It is the cause of more than half the purely surgical operations in our infirmaries. But most of all it finds its congenial sphere in the tissues of the lungs, and then it goes by the name of phthisis. All these used to be regarded as different diseases. Now they are known to be due to one and the same cause, the bacillus of tuberculosis. It is in the form of phthisis or pulmonary consumption that tuberculosis is mostly to be dreaded, for in consumption of the lungs it is reckoned that three-fourths of all the victims of tuberculosis find their doom.

The pathological phases of Consumption, however, are the concern of medical men. It is with other aspects of the question that local authorities have to do. What is their procuring cause, and what are the conditions that serve to maintain and spread the evil that ever since the beginning of civilisation has been hurrying millions of human beings to premature graves?

What Koch has done for the world in this matter of Consumption is to reveal not only the actual cause in the living organism of the tubercle bacillus, but also many of the chief characteristics of the organism. These are of the greatest importance to be known by the public, but especially by Local Authorities who are charged with the care of the public health. As we get better acquainted with the origin of the bacillus, with its manner of living, with the conditions most favourable for its sustenance and the elements most fitted to destroy it, so much the better shall we be able to provide against it, and perhaps to bring about its total extermination. Of its modes of operation more will fall to be noted when we come to consider its communicability and its preventability. But regarding the organism itself the following well authenticated facts may here be noted:

1. The organism is the sole and only cause of consumption in whatever form we find the disease. No bacillus, no consumption, may now be accepted as an indisputable and invariable axiom.

2. It belongs not only to man but to the lower animals as well. Domesticated animals are its most frequent victims, and those which are much shut up from the open air, such as the cow, are most liable to it. Pigs are its easy prey. Long before the cow was suspected, the pig gave its name—scrofula—to what has now been found to be but a department of consumption. Indeed, from the earliest civilised times the pig has been under ban, and has always found difficulty in obtaining recognition among beasts worthy to be eaten by man.

3. It comes from without. Virchow, admittedly the greatest living pathologist, says emphatically, "The tubercle bacillus comes from without, is brought to the body, and does not arise and develop in the body. Nearly all of us lived in the days when it was very difficult to rid oneself of the thought of the so-called *generatio aequivoca*, when intestinal worms were admitted to be produced in the human body, *de novo*, from the viscid deposit on the living membranes. We accept on the contrary that the germs come from without. On that rests the whole doctrine of infection, at whose original foundation I myself have somewhat assisted. Infection means that something foreign, some strange thing has come, just as the old doctors always supposed, though they inferred it mostly in the form of a spirit. The *spiritus* has now become a natural thing!"

4. The tubercle bacillus does not originate in nature outside the animal organism, and no natural place exists for its growth except within certain animals. Virchow points out that the animals it prefers are those "which we tend, which we shut up in great heat during their development, and which we partly love. It is just our domestic animals that contain the most danger—

and if a bacillus is found anywhere in nature, then every searcher into nature to-day will conclude—One of those domestic animals must have been near hand; no one will conclude that the bacillus could have come in some other way." But lest we should be terrified by the idea that man must get ever more infected by the domestic animal, Virchow assures us in advance that this fear is more theoretic than practical; it rests more on calculation and anxiety than on direct observation. "This," he says, "is one of the points which I have pleasure in stating, since I may perhaps show some persons that this heavy case is less heavy than they think."

5. The organism is one that thrives in the dark and at the usual temperature of the human body. All the conditions that bring about a low state of human health are among its favourite friends—bad air, dingy dwellings, poor food, intemperate habits, impurities of the person and of clothing—it is, in short, the potent scourge and penalty for every kind of violation of the common law of health.

6. It multiplies within the body by subdividing itself, and, at all events in the early period of its invasion, it multiplies very slowly. Dr J. B. Russell points out that its growth is greatly enfeebled at 86° F., and entirely ceases below 82·4° F., while it cannot grow at a temperature about 107·6° F. It flourishes at the natural deep temperature of the human frame. If, therefore, the temperature of a patient could be reduced to 82° F., or increased to nearly 108° F., his consumption would be stopped, but in the one case he would be frozen, and in the other he would be boiled, while in either his existence would be ended. Obviously, therefore, cure does not lie that way.

7. The bacillus, while it will not multiply outside the body, can yet live under certain conditions from which it may be called back into activity inimical to man. As dried dust of consumptive material, expectoration or dejecta, it may be carried about, or may lodge in clothing, unswept corners, or rough surfaces of apartments.

8. There are degrees of virulence in the bacilli. There are athletes among them that are powerful and swift in their evil work, and there are weaklings that can hardly produce any effect upon a healthy resistance. This accounts for the degrees of virulence with which the disease appears in different people.

9. Above all, the tubercle bacillus IS NOT HEREDITARY. Upon this point the testimony of the most eminent men is unequivocal and conclusive. "There was a dogma," says Virchow, "which, till quite recently, was considered almost indisputable, namely, the dogma of inherited tuberculosis. That is a bogie which moves men in manifold ways. In my quality of physician I have often enough been consulted by anxious fathers

and mothers as to whether they must not expect their children to be born tuberculous. When we see in many families how there are always new cases of tuberculosis occurring, how one generation dies off after the other, certainly the idea comes home to us that here is an inherited condition.

"I NOW DISPUTE THIS HEREDITY ABSOLUTELY!

"For a course of years I have been pointing out that if we examine the bodies of infants newly born who have had no life apart from the mother, we find no tuberculosis in them. I have the conviction that what looked like tuberculosis in the newly born was none of it tuberculosis. In my opinion there is no authenticated case of tubercle having been found in a dissected newly-born infant. After the birth certainly invasion can begin very rapidly. All the statistics and other scientific material that may be produced I reckon as indifferent. If it cannot be found that tubercle bacilli exist in an infant that has had no communication with the outer world, then I maintain the outer world must be added, that is an infection from the outer world; whilst up till now it was believed without further question that the infection was conferred on the child from birth. Doubtless a breach must exist somewhere by means of which the tubercle bacillus was communicated to the newly-born infant. Hence the question arises,—How must we act in order to protect the hitherto healthy infants? This is the true science of precautionary methods and it commends itself to every mother, every hospital, and every orphanage. With such a prophylaxis we should be able to obtain healthy generations. As regards measures for future adoption, my opinion is that a great part of the danger can be turned aside as soon as we manage to solve the milk question in a manner that will to some extent satisfy the claims of science."

It is to be remembered that these words, spoken only a year ago, come from a man whom for nearly half a century the whole world of learning has held in the highest regard, and who to-day stands with undisputed acknowledgment upon the very throne of medical science. And the thesis thus stated remains the accepted doctrine of learned men. All that is now brought against it to show that isolated cases seem to disprove it is regarded with only an academic interest, and what are pointed at as rare exceptions are only held to prove the rule, that the doctrine of heredity in tuberculosis is for ever exploded. Surely this great truth is worthy to be hailed as glad tidings of good to suffering humanity, and surely also it is fitted to awaken among sanitarians the liveliest hope. For if the disease is to be regarded, not as

an affliction coming with birth, but conditioned and dependent upon circumstances outside the body, it must consequently be regarded as an infectious and a preventable disease; and if it be a preventable disease, it must follow as clearly as the daylight that those who can control the conditions in which multitudes of our populations pass their lives may, if they will, powerfully check the spread of the evil. What has been possible in the stamping out of the plague, what has been achieved in the conquest of smallpox and to so large an extent in the reduction of typhus, not to mention other fevers, may now be held to be just as possible with a disease that, almost up to the present day, has been the constant and pitiless affliction of mankind. This non-heredity of the disease will be referred to later, for it is the central fact of all.

Meanwhile it is well that we should take into view—

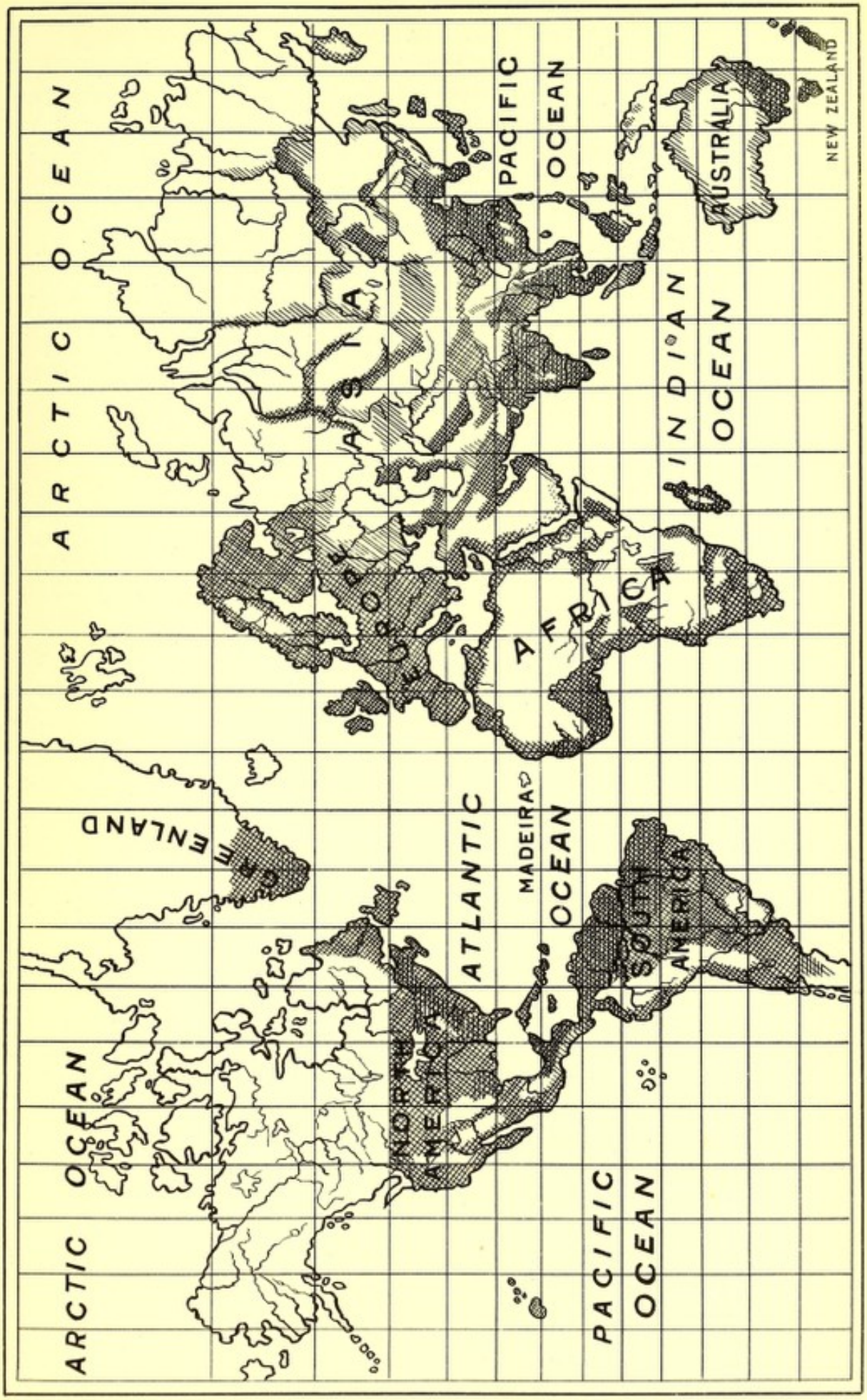
II. THE EXTENT AND DISTRIBUTION OF TUBERCULOSIS.

There has, no doubt, been a great diminution of the disease, especially during the past fifty years, since the importance of improved sanitation has been gradually recognised. The century now closing has done much for the enrichment of human life, in increasing knowledge among men, in improving the lot of those who labour by cheaper and better food, shorter hours and brighter homes, in the lessening of misery and disease, and in the almost total extinction of physical pain; yet, notwithstanding what has been achieved, it is calculated that in this closing year of the century the population of Europe alone will yield considerably more than one million victims to death by this terrible malady. Professor E. von Leyden of Berlin reckons that as in Germany there are at least 180,000 persons dying annually from consumption of the lungs, there cannot at the present moment be fewer than twelve hundred thousand persons suffering from consumption in greater or less degree within the German Empire alone.

Plate II. is produced here to present a general idea of the extent of consumption throughout the world. It is taken by permission from the Milroy lectures of Dr Arthur Ransome. Wherever civilisation extends there consumption spreads its dark cloud. A look at the map will show that our old ideas about the disease must suffer startling changes in the light of actual fact. Extreme cold used to be thought to be hostile to the disease, and warm countries used to be regarded as a safe resort for those afflicted by it. But the temperature of the human body is practically the same in all climates and among all races; and if only the consumption parasite can secure itself a home in the human breast, no matter in what zone, it will carry on its deadly work. What it cannot endure is exposure to fresh air and sunshine. But where these are absent it can, even when thrown out of its favourite dwelling-place, manage to survive for a longer or shorter time in the clothes and bedding and furnishings of human dwellings where it may be cast. Looking at our map of the world it will be seen that in Greenland and India, in the South American Republics no less than the United States, in South Africa and Northern Europe, in Australia, China, and Japan, wherever human beings are massed together, the destroying angel of consumption holds sway. The only mitigation of its influence lies in the habits of the people; whether they are clean or filthy, whether they live much in the open air or herd in ill-ventilated places. Labrador, unlike Greenland, is said to enjoy immunity, and this is explained by the fact that the sparse population have a habit of ventilating the interiors of their dwellings unknown, or at all events unpractised, in Greenland, Alaska, and Archangel, where consumption is common. When the people of Labrador come south to the shores of the St Lawrence, and occupy the ill-ventilated dwellings and mingle with the people there, they fall victims in even a greater degree. If the disease seems scarce in mountainous regions or in the deserts of Africa and Asia, it is only because of the scarcity of population and not because it is deterred by climate whether warm or cold.

Professor Hirsch, in his valuable work on Historical and Geographical Pathology, points out that in Asia Minor and the table land of Persia consumption is comparatively rare, while on the Arabian shore of the Red Sea, especially among the Bedouins "who have exchanged the tent for the stone-built house," it prevails. It is common in the most populous parts of India among British troops no less than among natives, but it diminishes among the Western Ghauts, the Nilghiri Hills, and on the Himalayan slopes. It is noteworthy that in India and indeed in the tropics generally, and in China and Japan, the

GEOGRAPHICAL DISTRIBUTION OF PHTHISIS.



disease shows a virulent type and is generally rapid in its course. Among the islands of the Southern Pacific native races suffer enormously, and it is said that in New Caledonia consumption accounts for two-fifths of all the deaths. That it is a disease of civilisation rather than of savage races is proved by the evidence of authorities who show that, until the habits of the natives came to be changed by more intimate intercourse with traders and European immigrants, the disease was unknown in the South Sea Islands. A better knowledge of present day facts will also show us that we must change our notions of the rarity of the disease in Australia and New Zealand. In the latter colony it has gone far to kill off the Maori race, while in the former it cannot be said that matters are any better than at home. In Japan a striking exception to the general rule in Asia is fast becoming apparent, owing, no doubt, to the spread of present-day knowledge, for upon the average of three years, 1892–1894 inclusive, the mortality from consumption had been reduced to 1·35 per 1000 inhabitants, or slightly under that reached in England and Wales at the same period.

In the American Union there is more consumption along the Atlantic seaboard than in the Western States. At the census of 1890 New York, with 3·87 per 1000 inhabitants, had the highest mortality of all the great cities of America. But New York, as we shall soon see, has shown a splendid example by the manner in which since 1892 she has grappled with the disease.

The consumption mortality of the United States shows in a remarkable way how much more readily the Negro races succumb to phthisis than the whites, for in every 100,000 inhabitants the dark race shows 583 victims against only 252 shewn by the white. This corresponds with the facts obtained regarding the coloured races in other countries, but particularly in Western Africa.

There is much yet to be desired in fulness and care in the compilation of statistics on tuberculosis in various parts of the world; but enough has probably been stated and proved to warrant the broad assertion that of all the ills that flesh is heir to, there is none so constant or so deadly as this terrible sickness which is responsible for not less than about one-seventh of the whole death-rate of the world.

Turning now to Plate III., we have a map of Europe—produced at the recent Congress in Berlin to show the relative mortality from tuberculosis in the countries of our own Continent and according to the most recent available statistics. Each country is shaded according to the mortality per million of the population in each. Spain, Portugal, Turkey, and Greece are not included, except the city of Madrid, as there are no reliable figures yet available from these nations. It is contrary to the old belief to find that Russia, the coldest country in Europe, has the bad pre-eminence of being also one of the most severely stricken with consumption. So wide-spread and so virulent is the disease that it is actually accountable for one quarter of the whole mortality of the nation. The low conditions of life among the masses of the people no doubt are the cause of this vast sacrifice, but if we look closely at these conditions, we shall find that none of them operates more powerfully than the almost universal habit of using furs, which are seldom properly cleaned, and which are passed on in families from sire to son with the accumulated infection they have gathered from consumptives who have used them and have lived, and probably died, in the homes to which they belonged.

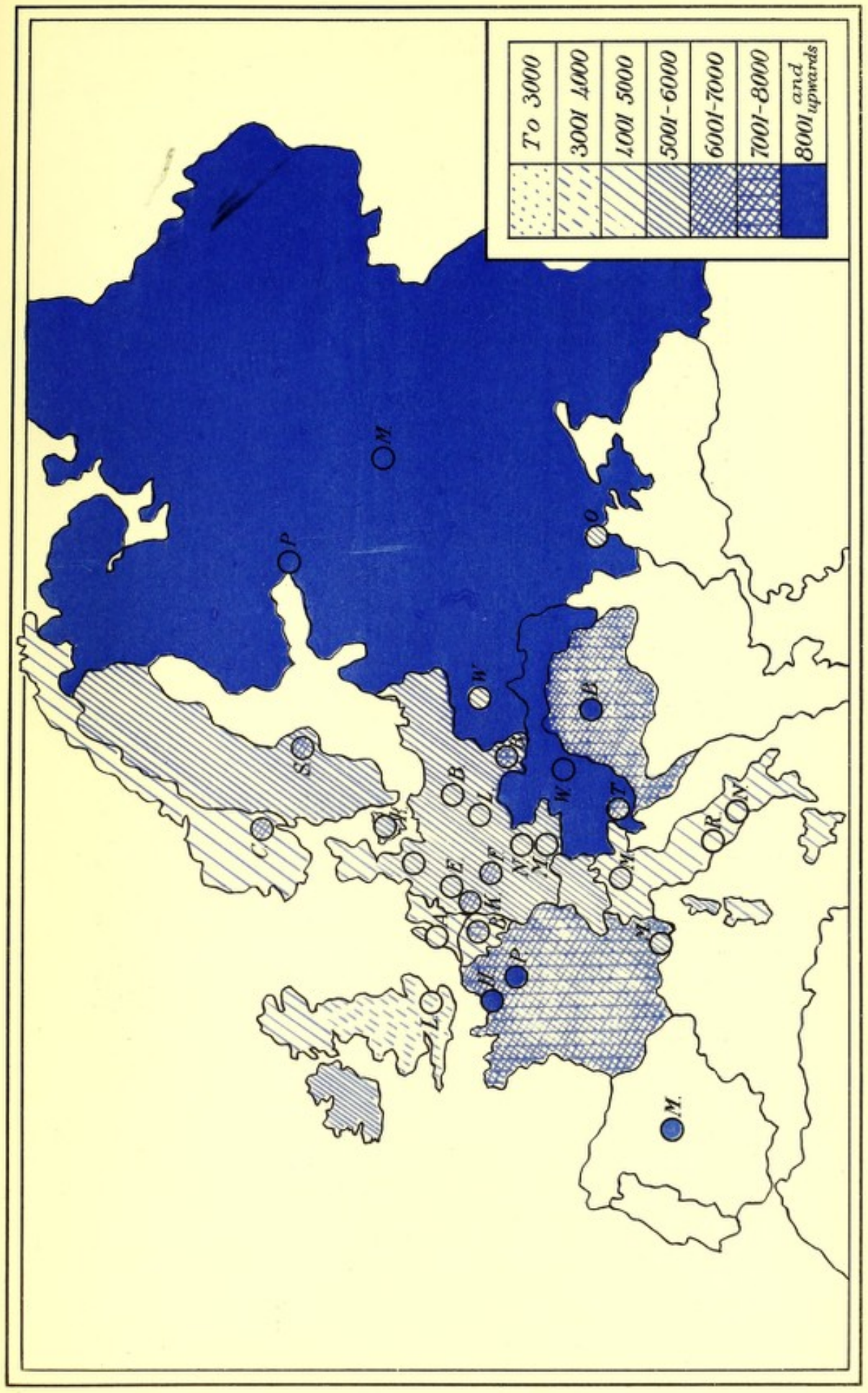
Next to Russia, Austria stands almost equal. Hungary shows a lower death-rate than Austria, for the satisfactory reason that there is more activity in sanitary reform in the country of the Magyars than in the older section of the Dual Monarchy.

France is little better than Hungary, except in its southern parts, Marseilles especially shewing a low mortality. Germany, Sweden, and Ireland are meanwhile to be classed together as upon the whole shewing the same mortality; while Norway, Denmark, Scotland, the Netherlands and Italy stand together in almost the best place, England and Wales taking the lead with the lowest death rate.

We have not been accustomed to associate advancement in sanitary ideas with the Italian Peninsula. We know how recently cholera ravaged Naples and Southern Italy. But it is remarkable that in the matter of consumption Italy has reaped the benefit of the belief, which was till recently regarded as a superstition, that consumption is an infectious disease. For over one hundred years in Italy and the south of France that belief has been religiously held, and the isolation of persons attacked with pronounced consumption has been rigidly and often cruelly enforced.

MAP shewing DEGREES of PREVALENCE of TUBERCULOSIS in various EUROPEAN STATES.

PLATE III.

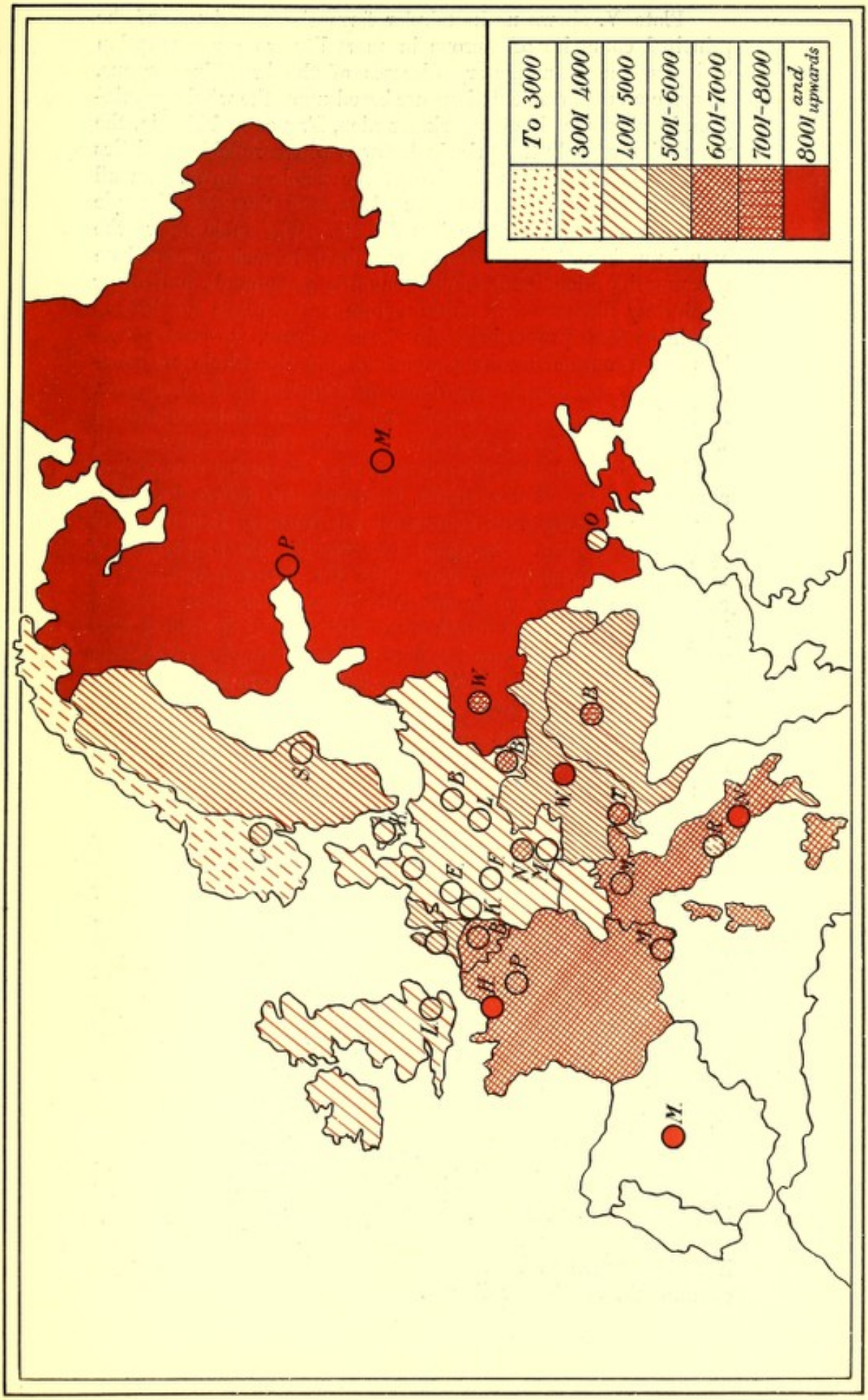


NOTE.—There are no Statistics from the Danubian States, Turkey, Greece, Spain, and Portugal, except the City of Madrid.

In Plate IV. we have a map of Europe to shew how the inflammatory diseases of the breathing organs affect the mortality in different continental countries. Italy, for example, no longer enjoys in the matter of pneumonia, bronchitis, asthma, and pleurisy the comparative immunity that she does from consumption. And the reason appears to be that she had sound ideas regarding the infectivity of consumption, and to a large extent acted upon them, while notwithstanding her sunny climate she knew no better than other people how to guard herself against other forms of chest disease. The city of Naples affords a striking illustration of this observation; for whereas its mortality from consumption is only about 1750 per million, it sacrifices to the other chest diseases about 9500. Russia takes the same bad eminence, and offers the largest number of victims by the common chest complaints, as she does with regard to consumption. Italy and France tie for the place next to Russia. Sweden and Austria-Hungary, though in different latitudes, stand together in the third place. Germany, Denmark and the British Islands come fourth; while Norway, notwithstanding its unpropitious climate, yields the lowest death-rate in Europe from the general respiratory diseases. This glance at the map under notice would suggest that the ordinary chest diseases are as little conditioned by climate as consumption itself, and that what is needed as the true safeguard from these as well as from consumption is the spread of better knowledge of the general rules of health, and, not least, perhaps, of how to maintain the functions of the skin in the most efficient condition.

MAP shewing the DEGREES of PREVALENCE of INFLAMMATORY DISEASES of the BREATHING ORGANS, exclusive of CONSUMPTION, in various EUROPEAN STATES.

PLATE IV.



NOTE.—There are no Statistics from the Danubian States, Turkey, Greece, Spain, and Portugal, except the City of Madrid.

Plate V. shews us in tabular form the experience of the principal countries of Europe in mortality from consumption and also the inflammatory diseases of the breathing organs. In some cases the calculations are based upon the whole population, in others, as in Denmark, Sweden, France and Russia, the population of only the principal towns where reliable statistics are kept is taken as indicative of the whole country. In all cases the most recent figures are given, and they are all made up on averages within the last decade. The table shews the actual number of deaths thus ascertained in each country from consumption alone, and from bronchitis, pneumonia and other respiratory diseases. In outer columns the totals are broken up into the proportions, in both classes, to every one hundred thousand of the population, and the whole are compared with the actual experience of Edinburgh for last year. A detailed examination of this and the other tables submitted with the Report will repay study. The chief points are all that need be distinctly referred to by way of special comparison and suggestion. For example, England now suffers less than any other country from consumption; Norway, Belgium, and Italy coming next. Scotland has exactly the proportion of Norway in consumption, but while the latter maintains an almost even proportion in mortality from other chest diseases, Scotland and England break away with largely increased proportions in these diseases. The United Kingdom with the Netherlands and Italy suffer least from consumption—though indeed they suffer heavily enough—but they suffer most from the other chest diseases. Why should this be so? It cannot be that the cause is to be found in the surrounding melancholy sea; for Denmark, Norway, Sweden are no less exposed to that influence. Nor can it be attributed to climate, for the northern peninsulas are not less rigorous than the British Islands. May the explanation not be found, as has been suggested, in the better habits of the people in avoiding extremes in clothing? This suggestion might be thought scarcely applicable to Austria-Hungary, where the consumption death-rate is relatively high and the death-rate of other chest diseases is relatively low. Yet it is to be remembered that the inhabitants of that country meet the extremes of summer and winter by methods of clothing that do not make for the preservation of a healthy condition of the skin. Germany and Switzerland keep up an equable proportion between consumption and the respiratory diseases, and with their improved knowledge and habits they are likely to yield fewer victims year by year to the same causes of mortality. Edinburgh compares well with the larger countries of Europe in consumption mortality, but in the matter of the respiratory diseases she does not stand at all so well. It is clear that we have still much to learn in the true methods of avoiding the common forms of chest disease.

PLATE V.

TABLE shewing Extent of CONSUMPTION and of INFLAMMATORY DISEASES of the BREATHING ORGANS in the Principal Countries of Europe, compared with EDINBURGH.

Country.	Year, or Yearly Average.	Inhabitants.	Actual Yearly Mortality.			In every 100,000 living there die yearly from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
England . .	1894-97	30,554,130	41,506	96,222	137,728	135	315	450
Scotland . .	1893-96	4,140,288	7,153	13,111	20,264	173	317	490
Ireland . .	1894-97	4,704,750	9,548	13,045	22,593	203	277	480
Norway . .	1891-95	2,014,600	3,500	3,543	7,043	173	176	346
Belgium . .	1890	6,147,041	10,859	28,772	39,631	177	488	645
Italy . .	1895-97	31,195,840	58,371	149,341	207,712	187	479	666
Holland . .	1892-95	4,704,971	8,865	18,859	27,724	188	400	588
*Denmark .	1894-97	795,540	1,521	1,847	3,368	191	232	423
Switzerland .	1894-97	3,046,063	6,194	6,485	12,679	203	212	415
Germany . .	1894-97	49,473,793	111,067	130,974	242,041	224	265	489
*Sweden . .	1893-96	952,674	2,200	2,590	4,790	231	276	502
*France . .	1894-97	7,236,426	21,877	22,023	43,900	302	304	606
Hungary . .	1893-95	15,663,658	49,871	38,182	88,053	318	244	562
Austria . .	1895-96	24,789,938	89,871	56,597	146,468	362	228	590
*Russia . .	1890-92	3,747,831	14,935	15,764	30,699	399	420	819
Edinburgh .	**1899**	**300,000**	**574**	**992**	**1,566**	**191**	**331**	**522**

* *Note.*—In these countries the mortality has been reckoned upon the experience of principal towns, making up the population stated.

The comparison we are now making is followed out in Plate VI., where there is shewn the mortality experienced in some of the principal cities of the world, with a population of half a million and upwards, in consumption and in the other chest diseases. Here in a more striking way than in the last, since this table deals with large aggregates of population, we can see the importance of giving heed to the conditions of health as against all diseases and not merely to one in particular. Naples stands lowest in consumption, reaping the reward of the safeguards of isolation which—perhaps in her superstition—she adopted more than a century ago; but she stands highest in her mortality from bronchitis and pneumonia because it is only the other day that she began to realise that there are laws of sanitation that must be obeyed before a community can secure conditions of general health. With a total mortality of 522 per hundred thousand inhabitants from the two classes of disease Edinburgh compares very favourably with the great cities—but she is, let it be noted, worse off than Amsterdam and fully 20 per cent. behind Hamburg and Berlin.

PLATE VI.

TABLE shewing Extent of CONSUMPTION and of INFLAMMATORY DISEASES of the BREATHING ORGANS in some of the Principal Cities of the World with a population of 500,000 and upwards, compared with EDINBURGH.

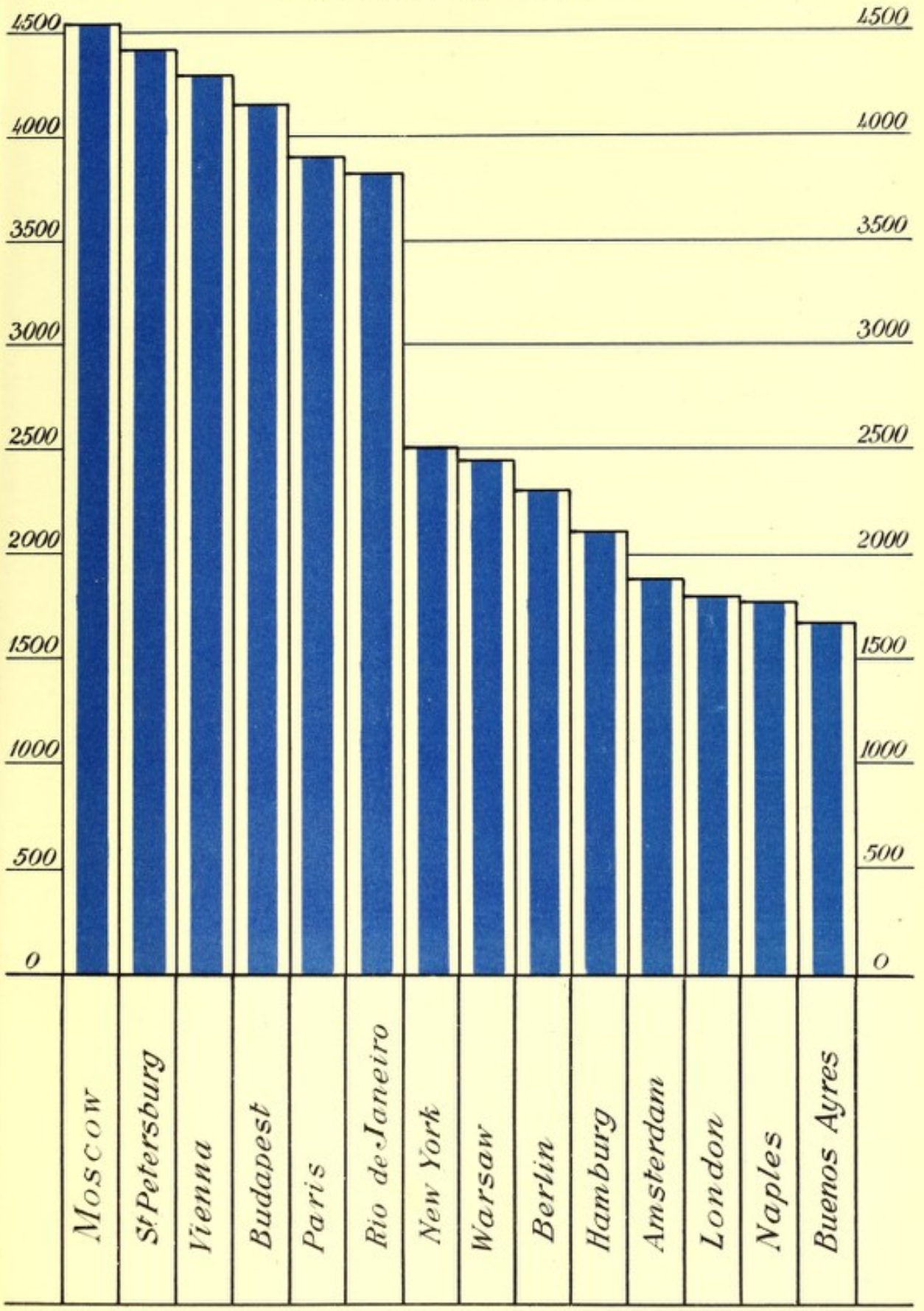
Capital.	Year, or Yearly Average.	Inhabitants.	Actual Yearly Mortality.			In every 100,000 living there die yearly from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
London . .	1894-97	4,406,659	7,789	15,311	23,100	177	348	525
Berlin . .	„	1,677,304	3,872	3,377	7,249	237	198	435
Hamburg .	„	625,552	1,323	1,278	2,601	211	204	415
Vienna . .	„	1,511,114	6,455	5,662	12,117	427	374	801
Budapest . .	„	579,275	2,398	2,214	4,612	414	382	796
Paris . .	„	2,511,629	9,720	6,182	15,902	387	246	633
Warsaw . .	„	551,668	1,378	2,242	3,620	245	411	656
New York .	„	1,777,641	5,001	6,403	11,404	252	324	576
Rio de Janeiro .	„	632,250	2,404	1,505	3,909	380	238	618
St Petersburg .	1889-92	1,027,624	4,532	4,319	8,851	441	420	861
Moscow . .	„	817,495	3,734	5,037	8,771	457	616	1,073
Buenos Ayres .	1892-93	567,542	938	2,808	3,746	165	495	660
Amsterdam .	1896-98	498,722	936	1,516	2,452	187	304	491
Naples .	1893-94 / 1895-96	527,192	929	4,086	5,015	176	775	951
Edinburgh . .	**1899**	**300,000**	**574**	**992**	**1,566**	**191**	**331**	**522**

Returning for an instant to consumption mortality alone, there is shewn by Plate VII. a series of columns graduated to the experiences of the principal capitals of the world. Moscow and St Petersburg stand highest. Vienna having ceded her position as the capital city of the disease—which used to be called Morbus Viennensis—comes next in order. Budapest is now making rapid steps in sanitary improvement and is already lower than Vienna. Paris comes next but does not make the progress which we should expect in the most enlightened capital of Europe, for the city of Rio de Janeiro with its taint of Spanish negligence is ahead of her. New York shews a noteworthy reduction—the fruit of more enlightened measures for the prevention of consumption within the last few years. It is pleasant to see the subject capital Warsaw setting a lesson in public health to St Petersburg and Moscow by presenting a death-rate in consumption nearly 100 per cent. lower than these cities. Berlin and Hamburg are rapidly reducing their consumption mortality; the latter city, as if in haste to regain the terrible loss she made by cholera, is now outstripping the German capital in this particular. Amsterdam has the place of honour among major continental cities, while London stands even better. In Buenos Ayres and in Rio de Janeiro it is remarkable to find such a comparatively low consumption mortality. The explanation probably is (though it is not warranted by the present condition of Madrid) that ideas regarding the communicability of consumption, referred to as so long prevalent in the south of Europe, have been maintained by Spanish influence in these cities with the relatively satisfactory results which this table shews.

CHART shewing RELATIVE PREVALENCE of TUBERCULOSIS in some PRINCIPAL CAPITALS of the WORLD at Close of Nineteenth Century.

PLATE VII.

The Rates are reckoned as per Million Inhabitants.



It is also interesting to look at the condition of some of the principal cities of Europe with populations from 100,000 to 500,000 and this is shewn by Plate VIII. in comparison with Edinburgh. Here again Edinburgh stands relatively well in the matter of consumption; all but exactly equal with Copenhagen and only excelled by Rome and Marseilles. But with regard to other respiratory diseases she has to give place to all the cities of Germany and the northern peninsulas; and it is only when compared with Milan, Marseilles, and Madrid that she can claim a creditable position. Madrid it may be observed presents a deplorable condition of public health both in regard to consumption and inflammatory diseases of the breathing organs. She sacrifices 407 and 949 per 100,000 respectively to these two classes of disease, giving a total of 1356 which must place her in the unworthy position of the most insanitary city of Europe. St Petersburg and Moscow are worst among the greater cities of the world, but they must yield the evil palm to Madrid.

PLATE VIII.

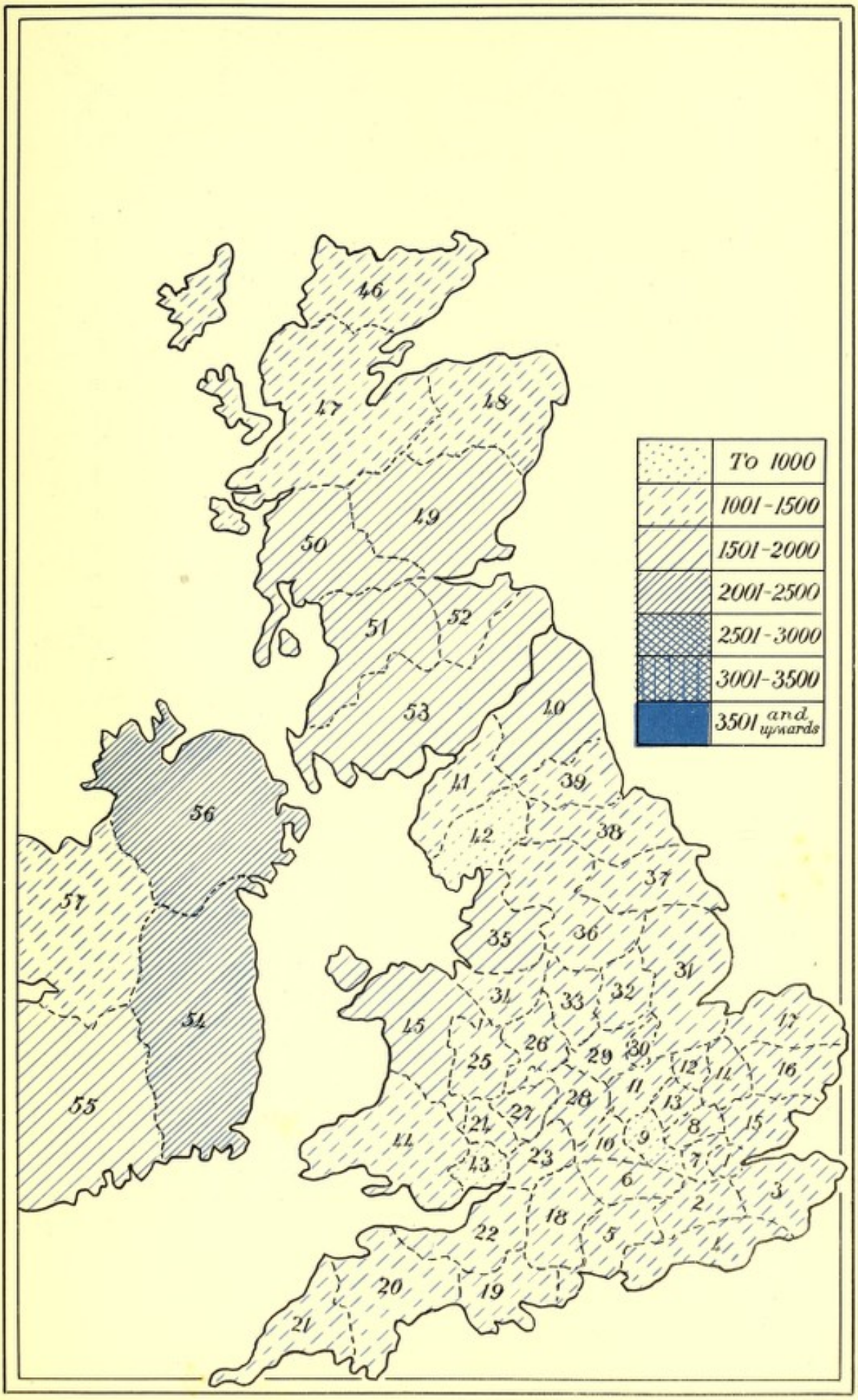
TABLE shewing Extent of CONSUMPTION and of INFLAMMATORY DISEASES of the BREATHING ORGANS in some of the Principal Cities of Europe with 100,000 to 500,000 inhabitants, compared with EDINBURGH.

City.	Year, or Yearly Average.	Inhabitants.	Actual Yearly Mortality.			In every 100,000 living there die yearly from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
Edinburgh .	**1899**	**300,000**	**574**	**992**	**1,566**	**191**	**331**	**522**
Breslau . .	1894-97	373,163	1,274	1,056	2,330	341	283	624
Frankfort .	„	229,279	627	485	1,112	273	212	485
Cologne . .	„	321,564	821	652	1,473	255	203	458
Elberfeld . .	„	139,337	322	359	681	231	258	489
Munich . .	„	407,307	1,241	1,055	2,296	304	259	563
Nurnberg .	„	162,386	670	427	1,097	412	263	675
Leipzig . .	„	399,963	977	846	1,823	244	211	455
Trieste . .	„	161,886	683	795	1,478	316	368	684
Rome . .	„	471,801	889	1,647	2,536	188	349	537
Milan . .	„	441,899	1,053	2,004	3,057	238	453	691
Havre . .	„	118,478	603	376	979	508	318	826
Marseilles .	„	447,344	845	2,102	2,947	188	470	658
Odessa . .	„	300,000	735	737	1,472	245	245	490
Christiania .	„	164,370	389	421	810	283	308	591
Stockholm .	„	259,304	686	667	1,353	265	257	522
Copenhagen .	„	338,151	648	762	1,410	192	225	417
Madrid . .	„	482,816	1,968	4,581	6,549	407	949	1,356
Brussels . .	„	190,313	596	634	1,230	313	333	646

Coming nearer home, we may now look at a map of the British Islands, Plate IX., shaded so as to shew the relative prevalence of consumption in the United Kingdom at the present time. Here are shewn some interesting facts which are worthy of careful study. Neither poverty by itself, nor poverty combined with severity of climate, is necessarily a cause of consumption, for the Province of Connaught, the Hebrides, and the wilds of Rossshire and Sutherland suffer as little from consumption as the southern counties of England. The Province of Munster has a much poorer population than the midlands and south of Scotland, yet it has only the same death-rate from consumption. If poverty be associated with an open-air life, and if life indoors has to be passed in wretched mud huts that, too freely for comfort, let in the fresh air of heaven, as is the case among the inhabitants of Connaught and the western Highlands, consumption at least will be a comparatively rare disease. But if with an improvement in material conditions there does not also come greater obedience to the laws of health then, as in Ulster and Leinster, there will be a greater number of victims sacrificed to consumption. These two provinces suffer more than any other section of the United Kingdom.

MAP shewing DEGREES of PREVALENCE of TUBERCULOSIS in GREAT BRITAIN and IRELAND. 1894 to 1897.

PLATE IX.



For fuller details regarding the prevalence of consumption and inflammatory diseases of the breathing organs throughout the United Kingdom there are presented Plates X. and XI. In the former there are set forth the statistics of the counties of England together with north and south Wales. Rutlandshire suffers least from consumption, shewing only 73 per 100,000 inhabitants, and Westmoreland, Buckinghamshire, and Monmouthshire are all below 100, and average about half the consumption mortality of Edinburgh. Examined by counties the consumption mortality is low, for the spare population of the country mitigates the denser population of the towns. It is when people are housed close together that consumption will thrive, if only ventilation and cleanliness be neglected. London presents a mortality of 173 for every 100,000; but the counties of Middlesex and Surrey, with London thrown out, are only 103 and 114 respectively. In other chest diseases the mortality in almost every county is rather more than double, while in the manufacturing counties, where unwholesome occupations exert a baneful influence, it rises to nearly three times that of consumption. Upon the whole the consumption mortality in England and Wales is 135, and that of inflammatory chest diseases 315.

PLATE X.

TABLE shewing the Extent of CONSUMPTION and of INFLAMMATORY DISEASES of the BREATHING ORGANS within ENGLAND and WALES.

ENGLAND AND WALES.

Countries or Provinces.	Year or Average Period.	Inhabitants.	Yearly Mortality from			Rate of Yearly Mortality for every 100,000 living Persons from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
1. London	1894-97	4,403,852	7,613	15,215	22,828	173	345	518
2. Surrey	,,	632,633	722	1,297	2,019	114	205	319
3. Kent	,,	855,100	1,022	1,864	2,886	119	218	337
4. Sussex	,,	584,461	758	1,217	1,975	129	218	337
5. Hampshire	,,	712,939	1,042	1,603	2,645	146	225	371
6. Berkshire	,,	278,195	305	596	901	109	214	323
7. Middlesex	,,	698,344	722	1,550	2,272	103	222	325
8. Hertfordshire	,,	221,020	269	477	746	121	216	337
9. Buckinghamshire	,,	168,357	164	393	557	97	233	330
10. Oxfordshire	,,	190,893	204	454	658	107	237	344
11. Northamptonshire	,,	323,389	370	769	1,139	114	238	352
12. Huntingdonshire	,,	48,846	52	123	175	106	252	358
13. Bedfordshire	,,	171,494	185	364	549	108	212	320
14. Cambridgeshire	,,	198,241	271	460	731	136	232	368
15. Essex	,,	885,073	970	2,285	3,255	109	258	367
16. Suffolk	,,	357,589	442	848	1,290	123	237	360
17. Norfolk	,,	465,896	518	1,102	1,620	111	236	347
18. Wiltshire	,,	257,771	266	632	898	103	245	348
19. Dorsetshire	,,	190,514	208	474	682	109	249	358
20. Devonshire	,,	648,527	876	1,939	2,815	135	299	434
21. Cornwall	,,	314,190	422	849	1,271	134	270	404
22. Somersetshire	,,	518,136	553	1,357	1,910	106	262	368
23. Gloucestershire	,,	559,289	686	1,590	2 276	123	284	407
24. Herefordshire	,,	110,961	120	303	423	108	273	381
25. Shropshire	,,	249,102	275	654	929	110	263	373
26. Staffordshire	,,	1,155,245	1,258	4,332	5,590	108	375	483
27. Worcestershire	,,	441,738	451	1,257	1,708	102	284	386
28. Warwickshire	,,	836,148	1,144	2,971	4,115	137	355	492
29. Leicestershire	,,	406,275	439	1,083	1,522	108	266	374
30. Rutlandshire	,,	21,668	16	48	64	73	222	295
31. Lincolnshire	,,	468,256	540	1,134	1,674	115	242	357
32. Nottinghamshire	,,	539,306	616	1,607	2,223	114	298	412
33. Derbyshire	,,	455,100	501	1,300	1,801	110	285	395
34. Cheshire	,,	745,945	949	2,395	3,344	127	321	448
35. Lancashire	,,	4,195,132	6,461	18,039	24,500	154	430	584
36. West Riding	,,	2,596,495	3,560	9,195	12,755	137	354	491
37. East Riding	,,	418,443	542	1,189	1,731	129	284	413
38. North Riding	,,	363,466	424	1,068	1,492	116	294	410
39. Durham	,,	1,101,429	1,533	3,530	5,063	139	320	459
40. Northumberland	,,	543,361	936	1,408	2,344	172	259	431
41. Cumberland	,,	273,850	337	737	1,074	123	269	392
42. Westmoreland	,,	66,989	57	124	181	85	185	270
43. Monmouthshire	,,	296,509	295	1,109	1,404	99	374	493
44. South Wales	,,	1,139,004	1,685	3,931	5,616	148	345	493
45. North Wales	,,	444,964	734	1,354	2,088	165	304	469
Total		30,554,130	41,506	96,222	137,728	135	315	450

In Scotland and Ireland—Plate XI.—we find a considerable increase in the consumption mortality, and a slight increase upon that of the other class of disease. In Ireland we find a still greater mortality from consumption, but a diminution in the death-rate of chest diseases. Taking the average aggregate of the United Kingdom, Edinburgh suffers more from both classes of disease.

PLATE XI.

TABLE shewing the Extent of CONSUMPTION and of INFLAMMATORY DISEASES of the BREATHING ORGANS within SCOTLAND and IRELAND, compared with EDINBURGH.

SCOTLAND.

Countries or Provinces.	Year or Average Period	Inhabitants.	Yearly Mortality from			Rate of Yearly Mortality for every 100,000 living Persons from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
46. North	1893-96	116,007	159	210	369	137	181	318
47. North-West	,,	163,302	235	381	616	144	233	377
48. North-East	,,	438,581	625	1,155	1,780	142	263	405
49. East Midland	,,	639,844	1,075	1,944	3,019	168	303	471
50. West Midland	,,	326,742	531	843	1,374	162	258	420
51. South-West	,,	1,634,286	3,163	6,290	9,453	193	385	578
52. South-East	,,	620,262	1,013	1,782	2,795	163	287	450
53. South	,,	201,264	352	506	858	175	251	426
Total		4,140,288	7,153	13,111	20,264	173	317	490

IRELAND.

54. Leinster	1894-97	1,187,760	2,708	3,815	6,523	228	321	549
55. Munster	,,	1,172,402	2,223	2,951	5,174	189	252	441
56. Ulster	,,	1,619,814	3,543	4,935	8,478	218	305	523
57. Connaught	,,	724,774	1,074	1,344	2,418	148	185	333
Total		4,704,750	9,548	13,045	22,593	203	277	480

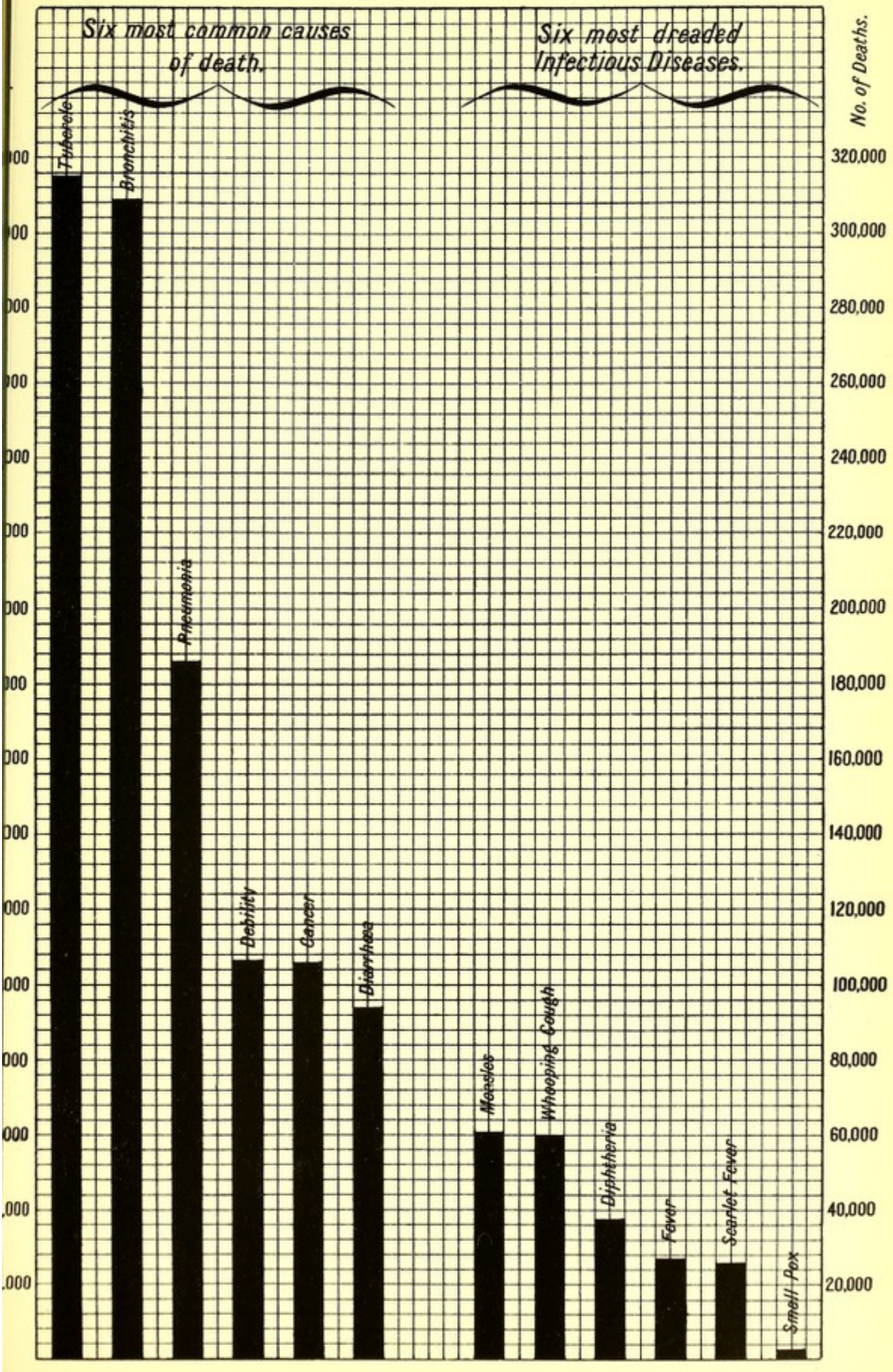
GENERAL TOTALS COMPARED WITH EDINBURGH.

Countries or Provinces.	Year or Average Period.	Inhabitants.	Yearly Mortality from			Rate of Yearly Mortality for every 100,000 living Persons from		
			Consumption alone.	Inflammatory Diseases.	Total.	Consumption alone.	Inflammatory Diseases.	Total.
England & Wales	1894-97	30,554,130	41,596	96,222	137,728	135	315	450
Scotland	1893-96	4,140,288	7,153	13,111	20,264	173	317	490
Ireland	1894-97	4,704,750	9,548	13,045	22,593	203	277	480
United Kingdom		39,399,168	58,207	122,378	180,585	170	303	473
Edinburgh	1899	300,000	574	992	1,566	191	331	522

In Plate XII. we have a chart to show in columns how consumption stands relatively to the common causes of death, and to the most dreaded zymotic diseases, upon the experience of England and Wales. This plate is presented by the favour of Dr Robertson of Sheffield. It is right we should have a wholesome dread of all infectious diseases, and that our fears should lead us to protect our communities against them. Every important town, every county council is now provided, or is anxiously providing itself with suitable isolation hospitals for the reception and treatment of infectious disease. It is interesting, and even startling, to observe from the plate how disproportioned are our views towards the fevers and towards consumption. We have not yet taken in the full meaning of the highly significant fact that, if we take the mortality of all the fevers put together and compare the total with the mortality from phthisis, we shall find that throughout England and Wales there die annually from consumption of the lungs alone, not to speak of other forms of tuberculosis, a considerably larger number than from all the popularly recognised infectious diseases combined.

Number of Deaths from several causes occurring in England and Wales during the 5 years, 1891-1895.

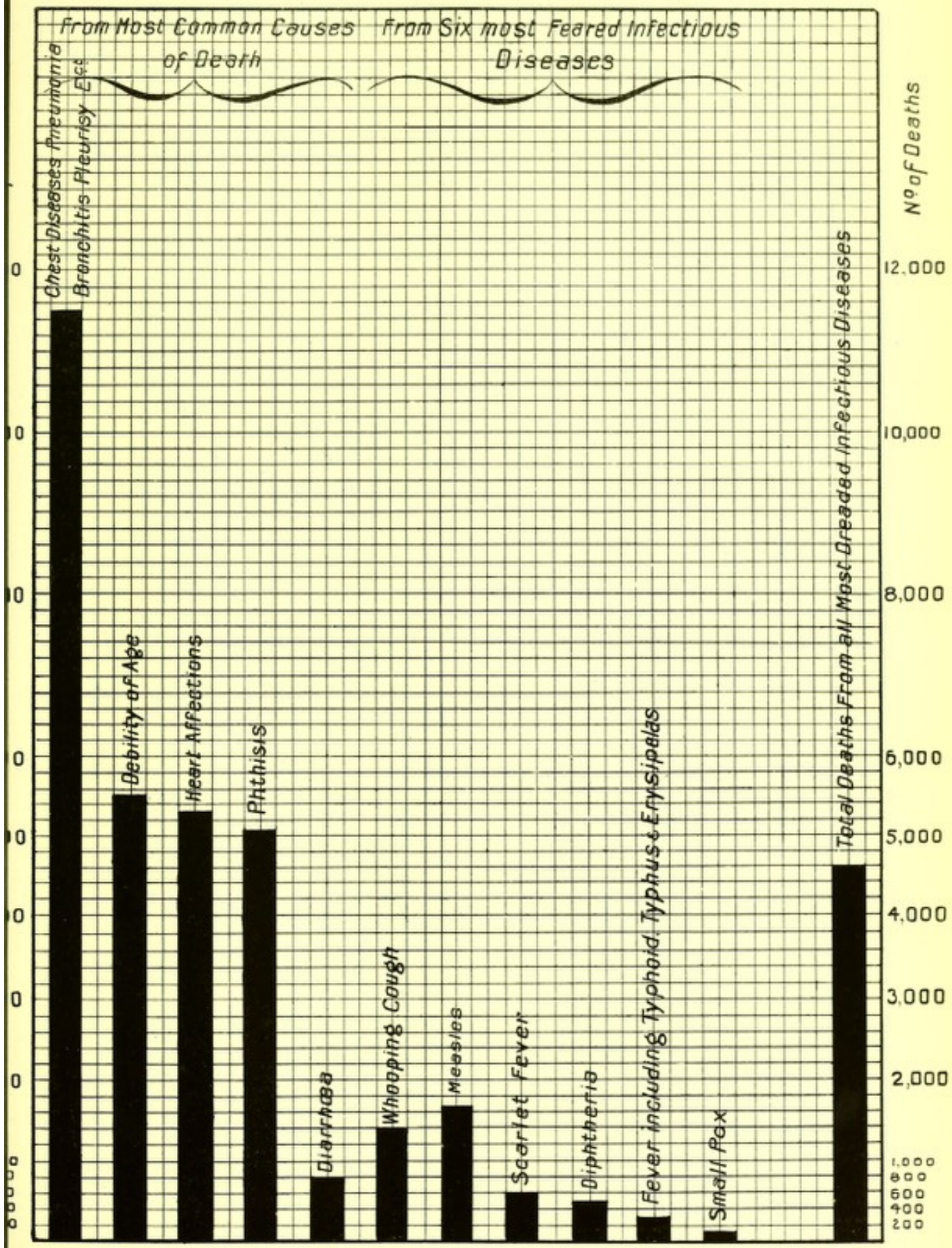
PLATE XII.



To bring this great fact more closely home to ourselves there is presented in Plate XIII. a chart constructed on the same principle as Plate XII. The total mortality in Edinburgh during the ten years ending 1899 from the most common causes of death, the ordinary chest diseases, pneumonia, bronchitis, asthma and pleurisy, heart disease, cancer, diarrhœa and consumption of the lungs, and placed alongside of the mortality from the most feared fever diseases, including typhus and small-pox during the same period, shews that all the most dreaded infectious diseases added together do not cause so large a sacrifice of life as consumption alone. It may be noted that Sir Henry Littlejohn's Report, page 79, shews that against the 574 deaths from consumption last year in Edinburgh there were only 400 from all the fevers combined.

Analysis of Mortality in Edinburgh

From all causes during Ten Years 1890-1899 Inclusive.



III. THE COMMUNICABILITY OF CONSUMPTION.

Long before the actual discovery of the tuberculosis bacillus by Koch investigators were satisfied that consumption was a communicable disease. Villemin had proved the fact by inoculating animals with preparations from the sputum of tuberculous patients and demonstrating beyond all possibility of doubt that the disease was produced in the animals by the inoculating substance. Following upon Villemin's demonstration other proof began to accumulate. It was found that physicians and surgeons were sometimes infected by blood poisoning caught in operations upon tuberculous patients or in the dissection of morbid specimens of tuberculosis. About the infectious nature of consumption no authority at the present day has any doubt. The modes by which the infection is communicated are of vital importance to all who would protect themselves or others against the invasion of the disease. When Koch's discovery became known, there came also a large revelation of the means that had previously been suspected of conveying the poison. It was now possible to put them to the test. If the bacillus were found in them their condemnation was certain.

In this way the discharges of patients, their clothing, their house furnishings, the paper on the walls of rooms that had been occupied by sufferers, were all put to the proof and shown to be more or less powerful agents of infection. As it became more and more clear that the bacillus of tubercle was the only true cause of consumption, however circumstances might favour its introduction to its victim, investigation took wider reaches and enquired into the circumstances in which patients lived, the food they ate, the milk they drank, the workshops where they laboured. It is now possible to refer to stores of proof that consumption is infectious and that it is conveyed to man in an infinite variety of ways, but by none less than what was formerly believed to be the only way, namely, from parent to child.

Innumerable instances may be given to show how the disease may be acquired by such means as have been just

referred to. The following is a case recorded by Dr Ducor, Paris:—

"A family of eleven persons—father, mother and nine children—hired a small apartment in October 1890. This apartment had been occupied since 1888 by a man and his wife; the man died of tuberculosis in May 1890, and the woman twenty days after, of the same disease. The mother and two children slept in the room where these two deaths had occurred. In 1893 these three persons, the mother, a little girl of nine years and an infant of sixteen months old, all showed symptoms of tuberculosis accompanying bronchitis after measles. Dr Ducor, struck by the symptoms of the disease, and the fact that the occupants of this room were the only members of the family who were affected in this way, made an investigation into the matter, which resulted in discovering the history of the former occupants. He then observed that the wall paper of the room in question was stained with the remains of dried sputum. Submitting this paper to the medical inspector of epidemic diseases, not only were tubercle bacilli found under the microscope, but two guinea-pigs, inoculated with an emulsion made with fragments of the paper, gave evidence of tuberculosis."

Among evidences of the communicability of consumption, Dr Heron quotes the following case:—

"A young, robust lawyer spent some time at a health resort, and some weeks after his return home showed symptoms of a rapidly fatal attack of consumption. It was found on inquiry that in the place referred to he had occupied a room and bed which had just previously been vacated by a consumptive who suffered from suppurating sores."

This mode of communication is even more strikingly exemplified by Englemann of Berlin, quoted by Dr Payne before the Epidemological Society in London.

"The case relates to "a particular dwelling or flat in a large house occupied by the families of several glass-blowers employed in a certain factory. This occupation is one known to produce remarkable liability to phthisis, and Englemann believes that 75 to 80 per cent. of the workmen in this particular place die of it. It is well known that this frequently has been ascribed, among other causes, to direct infection from mouth to mouth by the blow-pipe. However, that would not explain the special incidences here described. The house was built about 1865, and was generally in tolerable sanitary condition. The particular dwelling in question was badly ventilated and lighted. It was occupied from 1865 to 1873 by three families in succession, who were all healthy. In 1874 a family named Nestle entered, in which the mother was already consumptive, and had lost a son from the same disease. She died there from phthisis, and shortly afterward the family left, having lived there for one year only. The next occupants were a family (Gotz) of seven persons, all in good health, though there was a history of that disease in the mother's family. After one year's residence in this dwelling they left, and at a later time it was found that the father, mother and one son had died of phthisis, and a fine boy of chronic peritonitis. The third family occupying the dwelling were healthy on arrival, and had no hereditary taint. A child born in the house died of meningitis; another child died of 'marasmus'; another boy acquired hipjoint disease. Later on the father died of phthisis, and another child of meningitis; the mother became phthisical, and a surviving girl was extremely scrofulous. A fourth family

came in after the last mentioned; all healthy. The mother became phthisical, and bacilli were found in the sputum. Two children died of meningitis under one year old.

"Summing up the history, it appears that for eight years (1865-73) the dwelling was free from tubercular disease. Then came one year's tenancy by a person already tuberculous. After this, in a period of twelve years, at least twelve cases of tubercular disease were traced to this source. It is noted that the dwelling was never vacant, the new tenants entering while it was, so to speak, still warm from the last; and during the whole period it was never painted or cleaned. Englemann asserts that this neglect did not occur in other parts of the same large house, and that no similar instance of tubercular disease clinging to a dwelling was observed in them."

It is similarly accepted that as there are people with a stronger tendency than others to catch fevers, so there are people who possess a more or less strong predisposition to succumb to the invasion of the microbe of consumption. Landouzy of Paris says that to know that a certain organic medium is full of bacillary affinities means imposing on oneself an ever vigilant watch against the enemy. In such a case the physician can beforehand place his patient on guard, and can watch the slightest modifications that occur in the appetite, the weight of the body, the state of the strength and of the pulse, as well as in the least modifications of the breathing murmur revealed by the stethoscope. He can order the life of his patient, advise him as to the calling least likely to lead him into contact with the bacillus, or most likely to fortify him against it.

But some important authorities are not inclined to place the doctrine of natural predisposition too high. Loeffler declares that for the existence of an inborn or rather inherited disposition for tuberculosis no certain ground of support has been gained. On the other hand, he admits that it is very likely that other diseases of the breathing and digestive channels and food disturbances favour the accomplishment of the tuberculous infection. In a recent paper he states the two cognate questions of communicability to constitutionally disposed subjects and of the non-heredity of the disease with the results of such recent investigation in the German schools that many of his observations must be regarded with a special interest, and are translated here with some fulness.

"Even admitting all the instances of proved transmission from mothers to offspring, the numbers would still be far too low to make bacillary heredity of tuberculosis comprehensible.

"On the one hand, transmission from the mother only takes place if she manifests tuberculous changes of the highest degree; the extraordinarily preponderating majority of tuberculously infected mothers bring their infants into the world at a period when the disease is in the first stages of development, and chiefly within local limits; therefore the probability of a hereditary transmission of tubercle bacilli in mankind is

a remarkably small one. Consequently no practical importance can be attached to bacillary heredity as a means of spreading tuberculosis.

"Hence we see that the establishment of the occurrence of congenital tuberculosis has not offered to the theory of bacillary transmission the support which its partisans had hoped for. But, on the other hand, the recognition of the attainment of post-uterine bacillary infection has made great progress. *It would mean deliberately closing our eyes to facts, if, in face of this imposing proof-matter, we were to acknowledge bacillary transmission as a factor of any practical account in the spread of tuberculosis.*

"Now, although the fact that tuberculosis is spread by infection, and that the transmission of the bacillus does not come into practical consideration, is beyond all doubt, yet this does not settle the whole question of heredity of tuberculosis. Many recognise that tuberculosis results from infection, but they subscribe to the view that the bacillus clings only when it enters the body of a 'predisposed' individual. Without predisposition, no infection. They also recognise that the tubercle bacillus carries on its ravages in many families, only because the latter inherit from generation to generation a 'special predisposition' for the bacillus; that in this sense tuberculosis is still a hereditary disease. These deductions are derived, as I would specially emphasise, not so much from consideration of the rather rarer infections of the skin and mucous membrane, as from consideration of the accomplishment of the most frequent manner of infection, namely, from the breathing-organs. In the doctrine of predisposition, consumption of the lungs was always under review. Perhaps the specific predisposition for consumption may make itself outwardly visible by a peculiar build: the 'habitus phthisicus'—a long flat chest, with but slight expanding power; outstanding shoulder blades; pale transparent skin; innate narrowness of the arterial system; added to this, a peculiar quality of the tissues whose construction offers a specially favourable breeding-ground for the tubercle bacillus. But frequently this habitus phthisicus may be wanting, and yet the specific predisposition is there.

"I hold as an indubitable fact that a certain construction of the body, especially an abnormal build of the pectoral organs, plays a part in the origin of consumption of the lungs. Permit me to bring forward a really classic example, communicated by a friendly colleague of mine. It is of a family consisting of father, mother, two sons and three daughters. The father has a robust build of breast and is healthy; the mother is always sickly and consumptive. She springs from a family in which manifold cases of consumption have occurred. The daughters, as regards bodily build, resemble the healthy father. The sons resemble the mother: like her, they are too slender and have narrow flat chests. From earliest youth they were at distant schools and gymnasia, and only at home on holiday times. The elder son dies at the age of twenty-four of consumption; the younger has been consumptive and in a sanatorium from the age of twenty. The daughters do not fall ill, though they have been continuously exposed to a heightened danger of infection from the diseased mother. Without doubt, the inherited maternal physical constitution, and especially the inherited build of the pectoral organs, have been the decisive momentum for the sickening of the sons. A defective disposition and development of the breathing organs has favoured the settlement of the tubercle bacilli. But it certainly cannot be deduced from this example that both sons had a special 'predisposition' for the tubercle bacillus.

"The descent from tuberculous parents does not therefore imply a

special sensitiveness to tuberculosis on the part of the offspring. This can be proved by numerous observations and experimental inquiries that have been made.

"The offspring of artificially tuberculosed animals develop as vigorously as those of healthy parents, if they are shielded from infection after birth. This fact has been established by numerous observers—first by Koch, and last by Hauser as already mentioned. Bernheim has reported a few very interesting human observations under this heading. Three consumptive mothers give birth to twins. Of each of these, one twin remains in the family and is nursed by a healthy wet-nurse in the parental house. In each case the other twin is taken to the country and brought up on the bottle. Here is the result of the experiments:—The three children kept in the family and fed by healthy wet-nurses die of tuberculosis, as also two of the hitherto healthy nurses. The children brought up artificially, away from the mother, develop vigorously and remain permanently healthy and free from tuberculosis. To wish to make a blind chance responsible for the results of these experiments, would surely be to deliberately shut ourselves out from the impressions made by facts!

"In the numerous statistics that have been published on the results of treatment in sanatoria, prominence has been unanimously given to the view that the so-called hereditary burden, *i.e.*, origin from a family in which one or more of the ancestors or relatives have suffered from tuberculosis, in nowise implies a specially rapid or malignant course of the disease. In Turban's most recent report on the patients treated over a period of seven years in his institution at Davos, the so-called 'permanent results' amounted to 49·6 per cent. of hereditarily burdened cases, and only 44·8 per cent. of not burdened cases! If 'heredity' had any significance in prognosis, the burden from the paternal and maternal side must have shewn a diminution of results; but the 'permanent results' were these:—

Burdened only on the father's side	. .	42·4 per cent.
,, ,, mother's side	. .	42·2 ,,
,, ,, on both sides	. .	60 ,,

"Even where both parents were tuberculous, the permanent results were 50 per cent.

"All these observations testify against there being any specific predisposition for tuberculosis. If we wanted the point settled as to whether there are persons highly receptive, and others again but slightly or not at all receptive to the infection of the tubercle bacillus, we should have to take a greater number of persons, and administer to them all the same quantity of the same pure germ-matter, and in the same fashion. Then, if some sickened and others did not, if some recovered and others perished, we should be justified in adducing the proposition that there are varieties of predisposition for tuberculosis in mankind. Of course, experiments of this kind cannot be made on human beings. Consequently, the conclusion that there are varieties of predisposition has been drawn from certain observations. With some persons tuberculosis heals; with others it remains for long within local limits, and leads to death only after a long period of years; with others again, it strides forward so rapidly that the fatal sequel supervenes in a very short space of months or even weeks.

"The first group are not considered predisposed, the second moderately so, and the third highly predisposed. But the case is in nowise proved by observations of this sort. These varieties, among single individuals in their attitude towards tuberculous infection, may depend upon a very

different causative momentum to that of the existence of a greater or lesser predisposition for the tubercle bacillus.

"For example, the *quantity* of bacillary infection introduced into the body (as animal experiments teach us) plays a considerable part in the progress of the disease. If few bacilli are introduced, the process continues slowly; but if the body is inundated with plentiful quantities, the deadly result sets in rapidly.

"But here another extremely important factor comes into consideration—a factor which was little or not at all regarded until the most recent times; and yet it is perhaps *the* decisive one for the manner of the result of the infection—and that is the *virulence* of the bacilli causing the infection. From his experiments made principally on guinea-pigs, Koch had originally arrived at the conclusion that the virulence of tubercle bacilli is a 'constant' one, and does not alter even after years of artificial substratic breeding. But by and by he grew convinced that tubercle bacilli can be artificially deprived of their virulence, the same as the other pathogenous organisms. After Baumgarten, Arloing, and others had already established by unequivocal experiments that tubercle-bacilli could be enfeebled in virulence through allay of iodoform, the gastric juice of dogs, and other agencies, Loete, under the direction of Koch, established that the germs which the latter had been breeding on since 1882, had suffered an appreciable diminution of virulence in the course of years. The fact having thus been authenticated that a weakening of their virulence can be accomplished in tubercle bacilli without any special interference, the further question now resulted, Do various degrees of virulence occur in tubercle bacilli freshly detached from the bodies of mankind and animals? Are there natural races of tubercle-bacilli of differing virulence? Instigated by Koch, Vagedes undertook the difficult task of experimentally studying the behaviour of numbers of tubercle bacilli from various sources. Vagedes laid out pure germs taken from fresh tuberculous sputum, abscess-matter, nodes of the lungs, glandular abscesses and anthrax of cattle. Of the fresh germs, all obtained in like manner, like quantities were weighed off, and like quantities were introduced into various animals—guinea-pigs, rabbits and rats—partly under the skin, partly into the pit of the stomach, partly into the blood-circulation. I cannot in this place enter into closer details of these highly important experiments. The results of them, proved by facts, were these: In the case of guinea-pigs the whole of the germs produced universal tuberculosis, leading more or less rapidly to death. In the case of rabbits the germs offered very considerable varieties, in so far as a portion of them, on inoculation into the eye-chamber or under the skin, produced only a local process; whilst others of them, on similar inoculation, killed the animals, within from one to two months, through general tuberculosis. Only the latter germs proved effective, on subcutaneous injection in the case of rats also the former germs had no effect. These briefly noted experiments give proof that tubercle-bacilli under natural conditions can be endowed with very varying virulence. The course of the disease had indeed been very rapid and malignant in the case of those persons whose tubercle bacilli were shewn to be highly virulent when used for the animal experiments. Hence the virulence of bacilli must be a matter of great practical importance. If we now consider that the quantity and the virulence of the bacilli picked up in single cases may be extremely different, we cannot wonder that the disease runs such a different course in different persons.

"Whether human beings infected with the same quantities of highly

virulent bacilli would shew considerable varieties of action seems to be decidedly doubtful. These experiments have removed the whole question of predisposition to totally different ground. The existence of predisposition is in nowise scientifically proved. Everything rather favours the view that no specific predisposition exists. Through the kindness of a friendly colleague, I am enabled to report to you a case which is fitted to throw a clear light on the doctrine of predisposition in general, and the doctrine of heredity of tuberculosis and predisposition for it in particular.

"In 1896 a young lady of twenty-six falls ill of lung-catarrh and blood spitting. The family history is as follows: The father died of phthisis; the mother of tuberculous inflammation of the brain; two sisters died of phthisis at the ages of thirty and thirty-two; one sister sickened with blood spitting at the age of twenty-six; likewise four brothers at the ages of twenty-six to thirty-two. An upholder of the predisposition theory would say, on hearing these data, 'Here we have a most conspicuous case of predisposition; indeed, of inherited predisposition.' But critical analysis of the case leads to the following results: The grandparents on the father's and mother's side had always been healthy; the father had four brothers and two sisters, of whom twenty-eight children were born; the mother had four sisters with twenty-four children. None of these relatives ever contracted tuberculosis. The father and mother had eleven children, whose births occurred between 1850 and 1870. Up to the year 1872 no member of the family had ever been consumptive. In 1872 the father contracted tuberculosis pleuritis; in the course of seven years this took the form of consumption of the lungs and Adam's apple; and led to death in 1879. In 1882 the mother died of tuberculous meningitis; in the same year a daughter of 30 died of phthisis; in the following year, 1883, two sons of 27 and 32 sickened with blood-spitting; in 1884 a second daughter of 32, died of phthisis; in 1885 another daughter of 26, sickened with blood-spitting; in 1889 a son of 28, of catarrh of the lungs; in 1890 a fourth son, and in 1896 the fourth daughter of the same malady. Only one son never sickened; he went to the University in 1880, and had been very little at home. With the exception of two children, who died in infancy of other illnesses, and this son who had been far less exposed to infection, we find a thoroughly healthy family of father, mother, and eight children successively attacked by tuberculosis of the lungs, of the primary degree. The father succumbed to the infection, likewise the mother and the two eldest daughters, who, of course, took the largest share in the nursing of the invalids, and were therefore exposed to continual reception of tubercle-bacilli of the first degree. A closer study of tuberculous infections in families will prove that many cases similar to this one are simple infections, though they are tabulated in the statistics under the heading of 'Hereditary Tuberculosis' or 'Inherited Predisposition.'

"There yet remains for discussion a kind of predisposition which many physicians consider specially important, namely, the so-called individually acquired predisposition. Such a predisposition is said to be acquired through the surmounting of certain diseases which are accompanied by lesions of the respiratory and digestive tracts. Through these diseases the natural defence-arrangements of the body (against the entrance of tubercle bacilli into the mucous membrane in question) are said to be destroyed, or rather impaired; and thereby assistance is given to the infection. In childhood it is chiefly measles and whooping-cough, in grown-up persons especially influenza and typhus abdominalis, which are

said to cause predisposition. Syphilis and malaria also have this reputation. In my opinion, the possibility surely exists that the attachment of the tubercle bacilli can be favoured by those injuries to the tissues which go hand in hand with all infectious diseases, but particularly with such as draw the breathing-organs into sympathy with them. It is a fact, indeed, that the first symptoms of an undergone tuberculous infection have frequently been observed in individuals, as a direct sequel to one of the above diseases which they have overcome. Certainly it is often impossible to decide whether in these cases the infection set in afresh, or whether more probably an infection, which had already previously taken place, was made manifest through the new infection.

"Besides the above-named diseases there is a whole list of other affections and momenta which are said to predispose to tuberculosis.

"Half the diabetics are said to die of tuberculosis, for diabetes predisposes in a quite special manner. Bollinger and Preyss made experiments on animals which had been rendered artificially diabetic. The results did indeed prove that these animals were more easily infected by the inhalation of dried-up sputum, and showed wider-spread diseases of the lungs and bronchial glands, than similarly treated healthy self-controlling animals.

"The same experimenters obtained the same results from fasting animals. The diabetic predisposition and that engendered by hunger, both belong to the large group of 'acquired predispositions' whose common momentum is considered by many to be 'a depreciation of vital energy.' To this group belong the weakenings of the body caused by excesses 'in Baccho et Venere,' alcoholism, chronic disturbances of the functions of the stomach and digestion as observed in the so-called bad eaters; further, over-taxing of the physical and mental powers, rapid successions of pregnancy, immoderately long-continued suckling, mental depression of all kinds, home-sickness, the influence of imprisonment, inhalation of poisonous gases, injuries from wounds, chills, and the like. All these momenta, undoubtedly implying a weakening of the body, are said to create a special predisposition for tuberculosis. That enfeebled individuals of this sort occasionally sicken and die of tuberculosis no one will dispute. That they may even yield a larger percentage of tuberculous cases than an equal number of perfectly healthy persons of the same age, is easily possible—enfeebled individuals of this sort live variously under such conditions that they are actually more frequently exposed to infection than healthy persons—but that all those enfeebling momenta should call forth a special sensitiveness for the tubercle-bacillus, has certainly not been proved so far. It is not unlikely that the disease takes a more rapid and unfavourable course in the bodies of individuals weakened by one or perhaps several of the above-named momenta than in the bodies of healthy persons endowed with complete vital energy and power of resistence. But regarding this point, too, fully authentic, positive proofs are wanting.

"Many observers have also maintained that certain physical conditions cause individual immunity against tuberculosis. Thus, hunch-backs and persons suffering from emphysema are said not to sicken of tuberculosis of the lungs, because their manner of breathing differs from the normal. Persons who can inspire well, but expire badly, are threatened with tuberculous infection. But hunch-backs and emphysema subjects inspire badly and expire well.

"The greater or lesser fulness of blood in the vessels of the lungs is also considered of importance for the sensitiveness to tuberculosis.

Persons with such defects of the heart as give rise to overflows of blood into the lungs (*e.g.* insufficiencies of the mitral valve) are said to enjoy perfect immunity; and *vice versâ*, persons with such defects of the heart as prejudice the flow of blood into the lungs are said to offer a very special predisposition for tuberculosis.

"Then again, certain occupations are supposed to give immunity. Workers among coal-dust are said to be proof against tuberculosis. The alterations which cirrhosis develops in their lungs, and especially the inflammatory condition of the lymph-canals caused by the coal-dust, hinder the pushing forward of the bacilli.

"Immunity against tuberculosis is also imputed to labourers in lime-kilns. The hot, dry air they breathe is regarded as the momentum causing immunity. These men find themselves, so to speak, in an artificial desert-climate, which, according to the statements of various enquirers, both offers immunity and heals already developed phthisis.

"A special racial immunity has been as little authenticated as a special racial predisposition. It was believed for a while that negroes were quite specially predisposed for tuberculosis, at anyrate more highly so than white races, because manifold cases could be observed of negroes succumbing to acute caseous pneumonia. But when negroes are attacked by tuberculosis in temperate climates, the course of the disease shows no difference between them and the white population; hence their more rapid dying off in the tropics should surely be attributed to other momenta, special customs of living, and not to any special racial predisposition.

"So far, we know as good as nothing of any immunity against tuberculosis. It is a fact that tuberculous processes can heal. In these events of healing one may perhaps perceive an immuning event. So far no one but Koch has succeeded in effecting an artificial immunisation in animals by the introduction of larger portions of split-up tubercle bacilli. The question as to whether an actively, or even passively artificial, practically useful immunity can be obtained, will be settled by the soon forthcoming experimental researches on this point which are being made in so many places.

"If, in conclusion, I now put the question, What deductions for the practical fighting of tuberculosis as a national disease are to be drawn from heredity, predisposition, and immunity? I can specify them briefly: Since the transmission of the bacillus does not come into consideration; since the inheritance of certain constitutional peculiarities which favour the settling of the tubercle-bacilli cannot be prevented; since the sickening of numerous individuals of certain infectious diseases that destroy the natural defensory measures, as well as their enfeeblement by momenta of manifold kinds, can just as little be prevented; there remains only one single means of successfully preventing the further spreading of the disease: the prevention of the dispersion of the bacilli, and the most careful destruction of the germs expelled, more especially in families."

IV. PREVENTABILITY OF CONSUMPTION.

If consumption be, as it has been proved to be, a germ disease and a communicable or infectious disease, it follows as a matter of course that it must be a preventable disease. At this point, having as far as possible ascertained the fundamental facts of the cause, the extent, and the infectivity of the disease, we are able to turn to the more cheerful aspects of our problem. And we shall soon see that they are far more cheerful than we had dared to hope. Let us remember that first and before all it is a fact to be reiterated over and over again, and to be inscribed in letters of gold if that were possible, that

CONSUMPTION IS NOT HEREDITARY.

That fact we have just seen demonstrated in the statement from Loeffler and have had already confirmed by Virchow.

It is, in the next place, a fact of the highest significance that

NO CHRONIC MALADY IS SO AMENABLE TO THE APPLICATION OF SANITARY MEASURES.

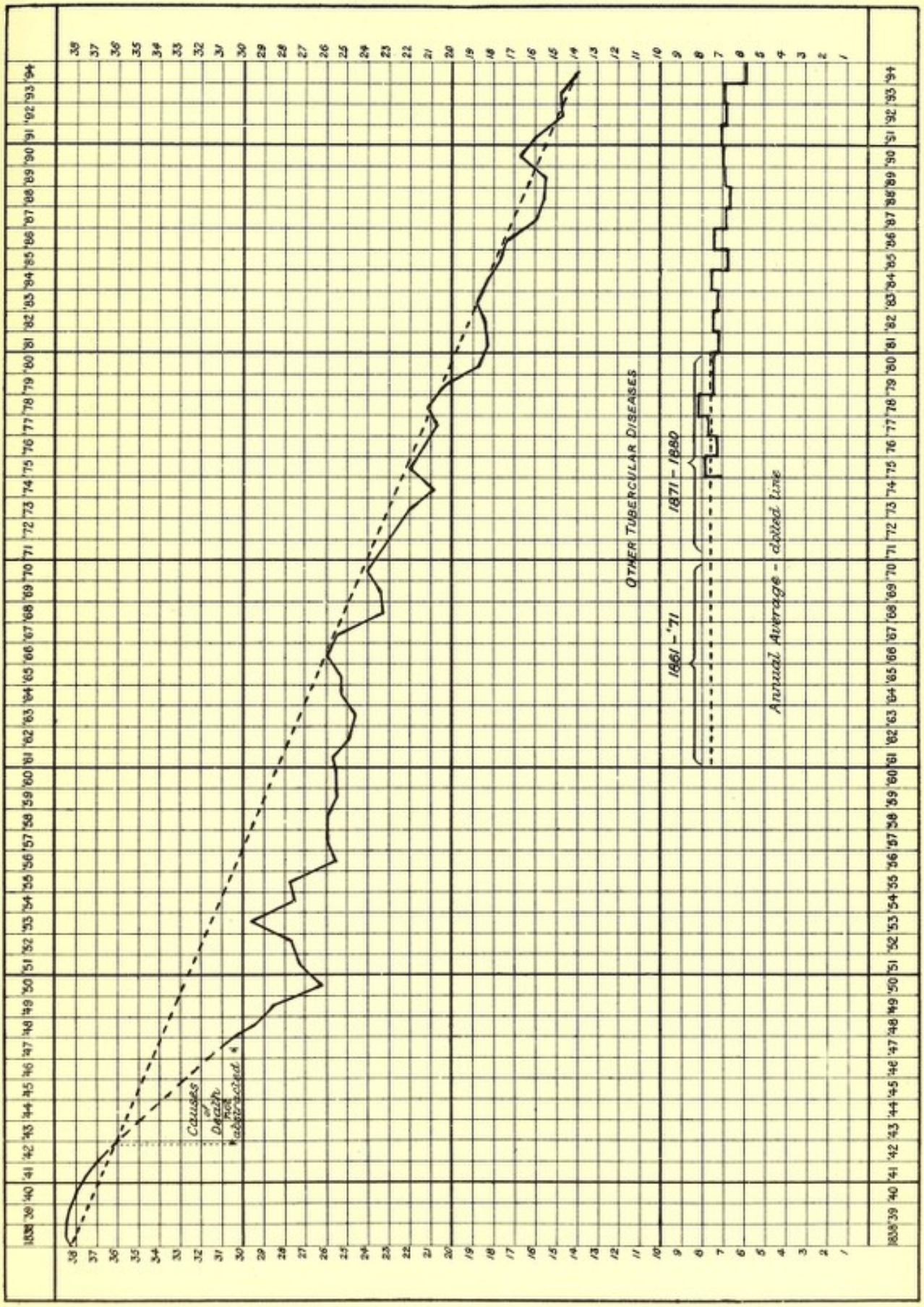
It is impossible to prove this proposition more clearly and conclusively than by referring to the chart on Plate No. XIV., showing the death-rates from phthisis in England and Wales from 1838 to 1894, and presented here by the kind permission of Dr Arthur Ransome, the compiler. In this chart there is set forth in graphic form the average mortality from consumption for every 10,000 living persons in England and Wales during each complete year of the Queen's reign from 1838 to 1894. Starting with the first year of Her Majesty—the year 1838—the death-rate from consumption we find was 38 in every 10,000 inhabitants. By the year 1894, a period of 56 years, that high death-rate had been reduced by nearly two-thirds, to only 14. What wondrous elixir produced such an unheard of change? It was nothing but the inbringing of healthier conditions of common life. *Sanitas sanitatum omnia sanitas* was once an exclamation of Disraeli, and the phrase was not only witty but expressed a profound truth. The period of the Queen's reign has been pre-eminently the period of reform. The Factory Acts mitigated the hard lot of children by forbidding long hours of toilsome labour before their strength was developed. The repeal of the Corn Laws brought cheaper and better food to the labouring masses of the people. The blessings of sun-

DEATH-RATES from PHTHISIS

in

PLATE XIV.

ENGLAND and WALES pr. 10,000 living. 1838 - 1894.



shine, and fresh air, and cleanliness began to be striven after. And the dawn of sanitary practice appeared. Improved drainage, better water supply, improved dwellings for rich and poor, shorter hours of labour, increase of open spaces and public parks, brought not material comfort alone but the elements of health as well. As people grew healthier they grew more able to resist the attacks of infectious disease. Although they did not realise it they were actually conquering the infection of consumption by gaining physical strength to withstand its invasions. If the death-rate that prevailed from consumption when the Queen came to the throne were the death-rate of to-day, instead of an annual mortality in England and Wales of 41,506, there would be a sacrifice of 104,104 lives every year. There are thus more than 62,000 lives now saved annually that then would have been thrown away to this devouring malady. In Scotland, upon the same calculation instead of the 7153 lives we now lose we should be losing 15,732, and in Ireland there would be a sacrifice of 17,879 instead of the 9548 actually lost at present. Throughout the United Kingdom instead of the actual loss by consumption of 58,207 precious lives, there would have been under the old conditions an added loss of 79,508 victims. If other forms of tuberculosis were taken into account, it is absolutely safe to say that we are now in the British Islands saving more than 100,000 lives every year through the diminution of tuberculosis, brought about by the advancement of sanitary knowledge and its application, even although no direct or special effort against the disease itself has been made. The plain teaching of these facts is that the better we attend to our sanitary conditions the more thoroughly shall we withstand this disease that has so long been thought to be a malady that we brought into the world with us and that must inevitably carry us out. If within sixty years, by the ordinary development of improved sanitary measures, consumption has been reduced by nearly two-thirds, is it unreasonable to expect that if only we now try to devise means of directly combatting what remains of the evil among us, we may, within the coming century, make consumption as rare a pest as small-pox, or even the plague of leprosy with which it has so much in common?

If it be objected to the chart now under notice that in the earlier years of the period diagnosis was not all so accurate as it now is, and that consequently the disease may not be so considerable as it would seem to have been, it has to be kept in view that inaccuracy of diagnosis is just as likely to have produced an opposite result. For it is only too well known that deaths may have been often attributed to other chest diseases

which should be with our increased knowledge at the present day assigned to their true cause of tuberculosis. The chart therefore may be taken as setting forth one of the most irresistible proofs of the preventability of consumption.

But the discovery of the bacillus of tubercle enables us to do much more in the prevention of consumption than would otherwise have been possible. For, as we have seen, we can now learn something of the channels which form the media through which consumption makes its way to the assault of man. These channels cannot all be described here, and much of what has been said under the heading of the communicability of the disease will suggest many ways by which infection is to be avoided. It has not, however, been sufficiently made clear that by means of food tuberculosis can readily advance to an attack upon its human victim. Upon this subject it is worth while to keep before us the teaching of the great German pathologist.

In a speech at the Tuberculosis Congress in Berlin last year, Virchow set forth his views on the communication of consumption by means of food, and some of these are recorded here:—

"To our bacteriologists to-day the ox represents the chief object of anxiety—one may say—the chief enemy of man. Another of our domestic animals has therefore half retired into the background, though it originally stood much nearer the front, and in these discussions it is considered somewhat too slightly. I refer to the pig, and I regret I must re-introduce it for your scorn. This animal evidently owes the threatened position it has held for thousands of years to the fact so frequently observed—it is peculiarly disposed to diseases which, as is now proved, stand in near relation to the bacillus. The presentiment of such a connection was so universal that from the most remote times in which scientific medicine existed at all, a certain disease took its name from the pig. The Greeks called it zolpades, the Latins translated it scrofulæ—scrofa a sow—our scrofula of to-day is nothing else than what the ancients regarded as a specially frequent and dangerous disease in the pig. In recent times the pig has receded far into the background; if we consider the care which the police officials of to-day exercise in the slaughter-yards, we observe it is bestowed more on the ox than the pig. This has its justification insomuch as the tuberculous variations found in the ox are frequently immense, much greater far—a hundred or even a thousandfold—than we usually find in man, and which in man because of their small size have been called tubercles. Hence it came that a special name was given from early times for the large formations in cattle; the Latins called them *strumæ* from construo, something built by nature, an instrumentum morbi. Out of this the more modern language has evolved the 'tuberculosis' of cattle with a certain tyranny I often deplore, and which to this day hinders me when I am to speak; for I am accustomed to *tubercle*, meaning a little thing; *tuberculum* is a little nodule, in opposition to *tuber* a big one. Therefore the ox-disease ought actually to be called *strumosis*. The expression tuberculosis, as applied to cattle, always vexes me; it is an etymological difficulty to which I call your atten-

tion. When Koch found the bacillus in the tubercles, he called it the tubercle bacillus, and that in which it was found tubercle; thus it came about that things which have nothing to do with little nodules—nodes which are even as large as a head—have been called tubercles. In the new, unfortunately still unfinished pathological museum built by the Government, I have ventured to place the principal forms of this disease in natural colours, according to the new method. The collection set up is still small; you will not find very much, but still a certain series of precise observations.

"The great colossal tuberculosis of cattle, which veterinary men have designated 'Perlsucht,' French, 'pommeliere,' has, as we can understand, taken a foremost position. The name has been bestowed because, after the discovery of single tubercle-bacilli, they called the entire node tubercle, and the animals tuberculous. Since then one fears infection from merely eating the flesh of such animals. With regard to this I take a much-weakened standpoint, the same which the State Government of Prussia, at least, has always firmly held in face of the many attacks it has suffered, as I may gratefully confess. We have no reason to assume that the entire ox is permeated with bacilli through and through if, for example, such nodes are found in his lungs. This disease has a certain stage in which it runs only locally, limited to a fixed region, and does not show itself beyond that, in which no bacilli or other diseased alterations are found, except for the node in the udder. Almost the entire flesh is sound, which has usually nothing to do with tubercle-bacilli. Of course, there are instances where the meat suffers in sympathy, but, as a rule, this is not the case. Hence our legislation permits the meat to be used after separation of the actually diseased part. I believe this explanation may relieve many a one who feared that, with every bit of meat he ate, he might be swallowing ever so many bacilli!

"In human pathology too, we have, for not many years back, become acquainted with certain local forms of tuberculosis. Till a few years ago it was believed that tuberculosis was a general disease attacking all parts of the body; but the conviction has gradually spread that quite local nuclei are formed. Thus tuberculosis of the joints is in the majority of cases only a local, not a general, affection. In the same way tuberculosis of the lungs is usually only an affection of the lungs, bronchial-glands, and neighbouring chest organs, but not of the organs of the lower body—at least very rarely indeed.

"I can therefore say, as the propositions laid before you state expressly that as regards the ox, the existing laws suffice to satisfy all the claims of science.

"With milk it is more difficult. Here, according to the opinion of many colleagues and myself, comes in the greatest difficulty. Not that the milk must frequently be already full of bacilli, when the disease is found in any region of the animal's body. That is not the case. There are cows which have the disease, and yet yield healthy milk. But it often happens (and I myself assisted, a decade or two ago, in starting the first researches into this) that the same nodes form in the milk-gland of the cow as are formed in the lungs; but when they occur there they frequently come into immediate connection with the canals which lead the milk to the outside in milking. Then one may get not only single ones, but thousands of bacilli into the milk-pail—a gruesome condition! That is indeed the most shameful and abominable thing that happens; for a single cow with such an udder suffices to infect whole villages and more.

"In face of this all the rest of the whole question of bovine tuber-

culosis is unimportant. Therefore I have pushed milk into the foreground. Here a whole series of careful controlling-measures is needed.

"I will not deny that I do not entirely concur in what has been mooted here with reference to another point. Radical help would only be found *by killing all such animals*: that, in my opinion, is the only way to bring about any permanent improvement! All others are only palliative measures; they might serve under certain circumstances, but might also easily fail. The sterilising of milk and allied methods are extremely useful, and I advise everyone to make use of this method as far as possible; especially every mother who cannot nurse her child herself should use a steriliser. But the sterilising apparata are not absolutely safe. Experiment has shown that in some cases living bacteria pass, even in family use, where surely the most care ought to be attainable. How much more in large businesses which have to supply the milk for large towns. There, indeed, it is difficult to find guarantees. I cannot deny that if it were possible to kill everything in the entire surroundings that is in any way the carrier of such germs, it would be of the greatest help.

"I would not here urge this point so far had I not learnt from my own experience to become more daring. You know that I carried out a successful war against trichina in its time. It had its difficulties too before our butchers resolved to enter into it, and before the public would accustom themselves to pay rather more for the examined meat; but it came about with time, and we have gradually got so far that the question of trichina-examination has assumed an international character. From time to time we are in the position of adopting a war footing towards the Americans —one has got accustomed to it—on this meat inspection question. Both sides recognise that Draconic severity is necessary—and that can only be carried out if we cashier the whole infected material, not only the living beast, but also the flesh. Similar measures will in the end have to be adopted with the so-called tuberculosis of cattle if we really mean to push the thing through. I have no scruple in saying now that the more I have occupied myself with it, the more I am convinced that we can find no other help. We have an approximate means of diagnosis: that is the use of tuberculine injection, whereby certain feverish conditions are produced in the animals which serve as diagnostic symptoms. But there are exceptions here too, fortunately not very frequent—so that tuberculine-injection must at any rate be regarded as a valuable means of recognition. However, it is not a means that would render all further safeguards unnecessary. Could we but arrive at eliminating the whole stock of diseased animals, then, I think, a radical help would be possible. How far that is necessary I cannot fathom, for we have no accurate knowledge as to how the oxen of all countries are circumstanced, or how many among them are actually diseased. But in Germany, at any rate, the ground would be found already prepared for such a legislative measure. If I may judge from my experiences as a parliamentarian, I may say that every year I see a greater number of Members of Parliament coming from their constituencies, and entering Parliament with the thought that we must proceed further with the slaughter of diseased beasts, we must expend larger means in order to improve the general conditions of health. I desire to raise my voice for this cause on this occasion; and if you on your part will assist it in the future, then it would indeed be possible perhaps to carry something through.

"Pigs, too, would have to be more strictly safeguarded. I will not proclaim their general destruction. Fortunately there are not many

tubercles found in pigs—frequently only in the organs of the neck, where they can be easily got rid of by a certain practice of the butchers. But I desire to call attention to this: where arrangements exist for expert examination, one must bestow due attention on pigs too, and may not regard them as a negligible quantity.

"On the other hand, on the strength of the very exact and repeated examinations made of late years, especially by the Parisian bacteriologists, I am of opinion that the danger of taking tuberculosis from poultry is very slight. We sometimes read in the papers that a family has been infected here or there by a parrot or some other bird. It has, however, been ascertained that, although tuberculosis does occur in birds—it is even occasionally present in our domestic fowls—yet it is a different species of bacillus, we find, one that, if carried over, does not produce tuberculosis again, but disorders which are not the right tuberculosis disease. This may therefore be overlooked. I do not think that any special restrictions need be laid on poultry-dealing on this account."

The tendency of tuberculosis to disappear upon the approach of sanitary science is further manifested by the experience of the great cities of New York, London, Paris, Berlin and Vienna, as shown by Plate XV. In New York, where now precautionary measures have within recent years been stringently enforced, there has been a decrease of 14.8 per cent. in 1896 as compared with 1889. Paris seems very slow to move towards improvement. Berlin makes a gain of 15.6 per cent. in eleven years, while Vienna, it is pleasing to note, shows an even greater diminution during the same period.

Mortality from Tubercular Diseases.

General Death-rates from all Causes, Deaths and Death-rates from Tubercular Diseases, per 1000 *Population in New York, London, Paris, Berlin, Vienna, from* 1884 *to* 1894, *inclusive.*

(From the Official Statistics).

Year.	New York City.			London.			Paris.			Berlin.			Vienna.		
	General Death-rates from all Causes.	Deaths from Tubercular Diseases.	Death-rates from Tubercular Diseases.	General Death-rates from all Causes.	Deaths from Tubercular Diseases.	Death-rates from Tubercular Diseases.	General Death-rates from all Causes.	Deaths from Tubercular Diseases.	Death-rates from Tubercular Diseases.	General Death-rates from all Causes.	Deaths from Tubercular Diseases.	Death-rates from Tubercular Diseases.	General Death-rates from all Causes.	Deaths from Tubercular Diseases.	Death-rates from Tubercular Diseases.
1884 . .	25·82	6,039	4·45	20·39	12,537	3·12	25·44	11,625	5·19	26·33	4,534	3·62	26·80	5,470	7·20
1885 . .	25·55	5,953	4·26	19·67	11,850	2·90	24·38	—	—	24·38	4,657	3·61	28·50	5,574	7·23
1886 . .	25·99	6,349	4·42	19·89	12,164	2·93	25·25	12,258	5·56	25·63	4,547	3·40	26·60	5,525	7·04
1887 . .	26·32	6,007	4·06	19·53	11,424	2·71	23·92	11,818	5·15	21·84	4,388	3·16	25·80	5,110	6·42
1888 . .	23·39	6,073	3·99	18·42	10,929	2·54	22·92	11,472	4·93	20·30	4,554	3·16	25·20	5,054	6·26
1889 . .	25·32	6,041	3·86	17·47	11,168	2·56	23·78	12,047	5·11	23·00	4,938	3·30	24·50	4,802	5·85
1890 . .	24·87	6,409	3·97	20·98	12,306	2·94	23·70	12,586	5·26	21·51	4,684	3·02	24·40	4,876	5·85
1891 . .	26·31	5,909	3·56	21·11	11,854	2·81	22·45	12,430	5·13	20·82	4,743	2·96	25·01	7,940	5·76
1892 . .	25·95	6,061	3·55	20·31	11,465	2·68	23·24	11,153	4·54	19·97	4,357	2·66	24·97	7,745	5·50
1893 . .	25·30	6,163	3·51	20·83	11,426	2·65	22·25	12,267	4·92	21·01	4,671	2·72	24·40	7,418	5·16
1894 . .	22·76	5,730	3·16	17·80	10,570	2·43	41·32	12,376	5·10	17·57	4,283	2·51	23·20	7,417	5·06
1895 . .	23·10	6,283	3·34												
1896 . .	21·54	5,926	3·06				(Other data not yet published.)								
Average, 1884-89	26·01	—	4·23	19·58	—	2·84	24·38	—	5·20	23·69	—	3·39	26·58	—	6.83
Average, 1889-95	25·08	—	3·60	19·75	—	2·68	22·78	—	5·10	20·64	—	2·86	24·35	—	5.53
Decrease, per cent.	—		14·8	—		5·6	—		1·9	—		15·6	—		19.0

Note.—The ratio of deaths to population has been calculated from the figures given in the official reports, but the mortality rates for Paris are somewhat higher than they should be, as the last census in Paris was taken in 1891, and no allowance is made for increase of population. In Berlin, on the contrary, the rates are somewhat lower than they should be, owing to the mode of estimating the population in Berlin, which, when the census was taken, in 1895-96, proved to be incorrect. In Vienna, in 1891, the suburban districts were included in the city limits, which accounts for the greater number of deaths from that time.

Having regard to its size it is remarkable that London presents such a satisfactorily diminishing mortality from consumption. Plate XVI. shows in Table I. the gradual gain that has been made in other forms of tuberculosis apart from phthisis. In these the gain is more gradual than in the case of pulmonary consumption. But it points towards the better protection which is obtained from sanitary precautions, and it shows how even scrofula, consumption of the bones and the bowels and the brain, may ultimately be overcome. In Table II. it is shown how consumption of the lungs is more rapidly yielding to improved hygienic influences. Within eleven years, from 1886 to 1896, the gain was as high as eighteen per cent. The number of deaths from consumption was larger in the former year, with a population of little over four millions, than it was in the latter year with a population increased by nearly half a million souls.

It has been recently shown by Dr Schjerning of Berlin that in the German Army, on the announcement to the world of Koch's bacillus in March 1882, the authorities took steps to utilise its lessons for the benefit of the army, and thus of all Germany.

"In 1882-3 the death-rate in the army was 0.63 ; in 1897-8 it was 0.24 per 1000. This is the direct result of quicker recognition of tuberculosis in the individual cases, and getting them segregated in the army sanatoria and hospitals. Thus, in the German army, unlike that of other countries, an ever *in*creasing number of rank and file is accompanied by *de*creasing number of cases of tuberculosis. Schjerning foresees that the army of the future will be the first great State institution in which tuberculosis has disappeared. It was also the first in which small-pox disappeared, thanks to the compulsory re-vaccination in 1830 of the III. Army Corps.

"From the high importance attached to the combating of tuberculosis in the army, the collecting of statistics was seen to be essential. Every case of tuberculosis or bleeding of the lungs was noted, and 6924 cards are in evidence with the results of the careful observations of the doctors. It has been established that men belonging to "Front Service," Infantry, Artillery, Cavalry, Pioneers, have a larger rate of general illnesses, but a *lower* of lung-complaint. On the other hand the men appointed to activities in enclosed spaces are the opposite. Especially the artisans, clothing department workers, writers for district commandoes, military bakers and musicians, show relatively high tuberculosis percentages. These are important facts: that out of 1000 men offering at over 22 years old, 26·2 are ill of tuberculosis. The age of 20 is the most favourable both for avoiding tuberculosis and for entering the army ; out of 1000 men of the age of 20, only 2.4 have tuberculosis."

Another very important and striking fact is shewn by the experience of Orphan Houses in Germany. In these houses many of the inmates are children of parents who have died in consumption ; yet among the orphans brought up under healthy conditions consumption rarely occurs.

PLATE XVI.

TABLE I.—*Annual Mortality in London per Million Living from Tuberculous Diseases, other than Phthisis; presented to shew the gradual diminution of the disease within thirty years to* 1890.

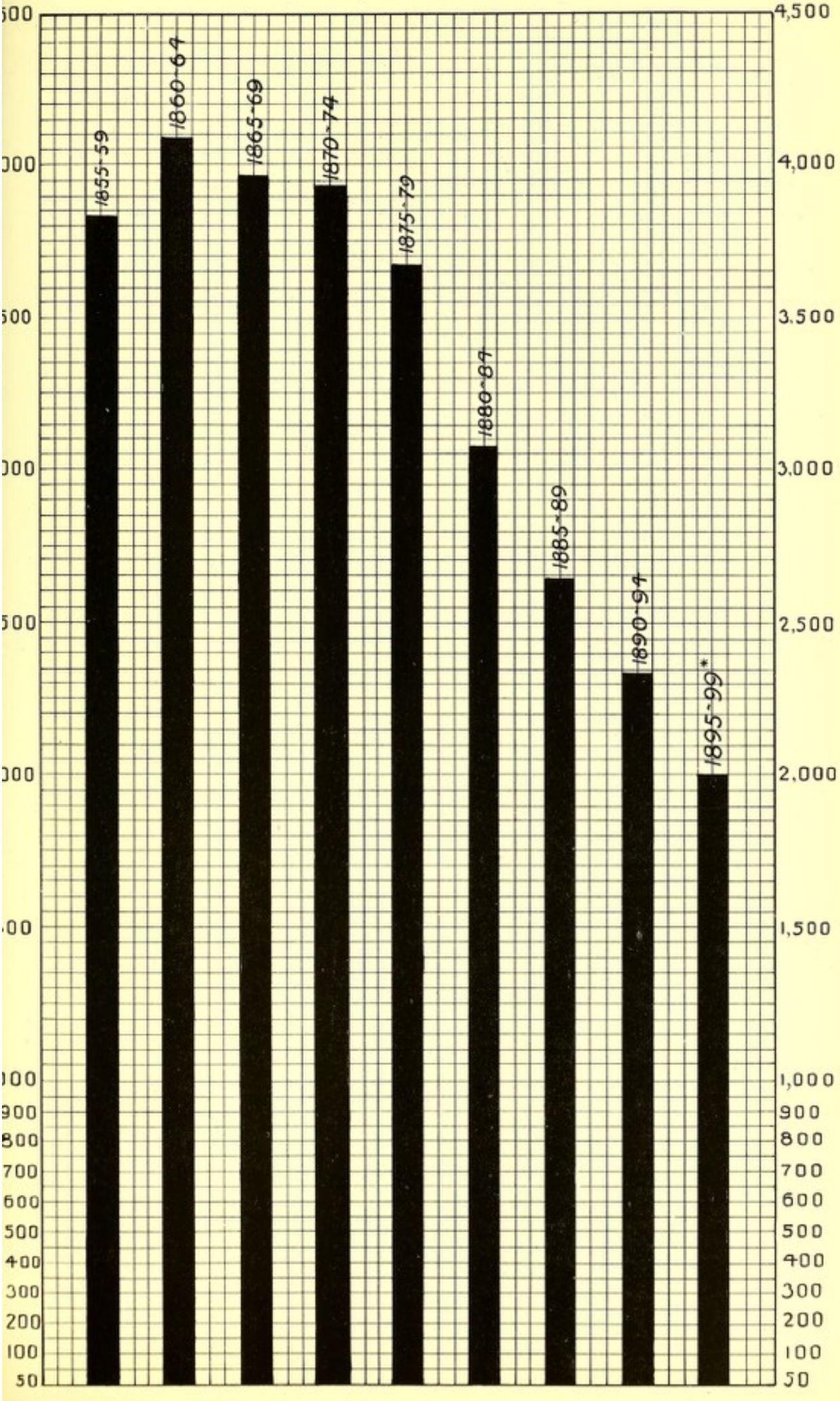
Decennia.	Rates per million.
1861-70	765
1871-80	747
1881-90	696

TABLE II.—*Shewing diminution of Consumption in London between* 1886 *and* 1896.

Year.	Population.	Deaths from Phthisis.	Rate per million.	Percentage of Difference.
1886	4,018,666	8,409	2,092	100
1887	4,058,565	7,832	1,930	92
1888 (leap year)	4,110,090	7,516	1,829	87
1889	4,139,555	7,774	1,878	90
1890	4,180,654	8,689	2,078	99
1891	4,221,522	8,319	1,971	94
1892 (leap year)	4,272,543	7,869	1,842	88
1893	4,300,580	8,043	1,870	89
1894	4,340,663	7,426	1,711	81
1895	4,381,119	7,779	1,776	84
1896 (53 weeks)	4,494,645	7,778	1,731	82

If we need further proof of how amenable our great enemy is to a wisely administered department of public health we shall see from Table XVII. how Glasgow has fared since she began to assail the strongholds of disease in the poorer parts of the city. With the nine quinquennial periods ending last year she has reduced her consumption mortality to less than one half what it was forty-five years ago, before the time when her crusade against insanitary conditions began. Consumption prevails where impurity is greatest. It hides its head as ashamed where purity appears. Purity of the person, of the home, of water, food, air and clothing, is to be regarded as the true and sure preventive of consumption.

COMPARATIVE TABLE of MORTALITY from PHTHISIS in GLASGOW per MILLION INHABITANTS in QUINQUENNIAL PERIODS for 45 YEARS, 1855-99 inclusive.



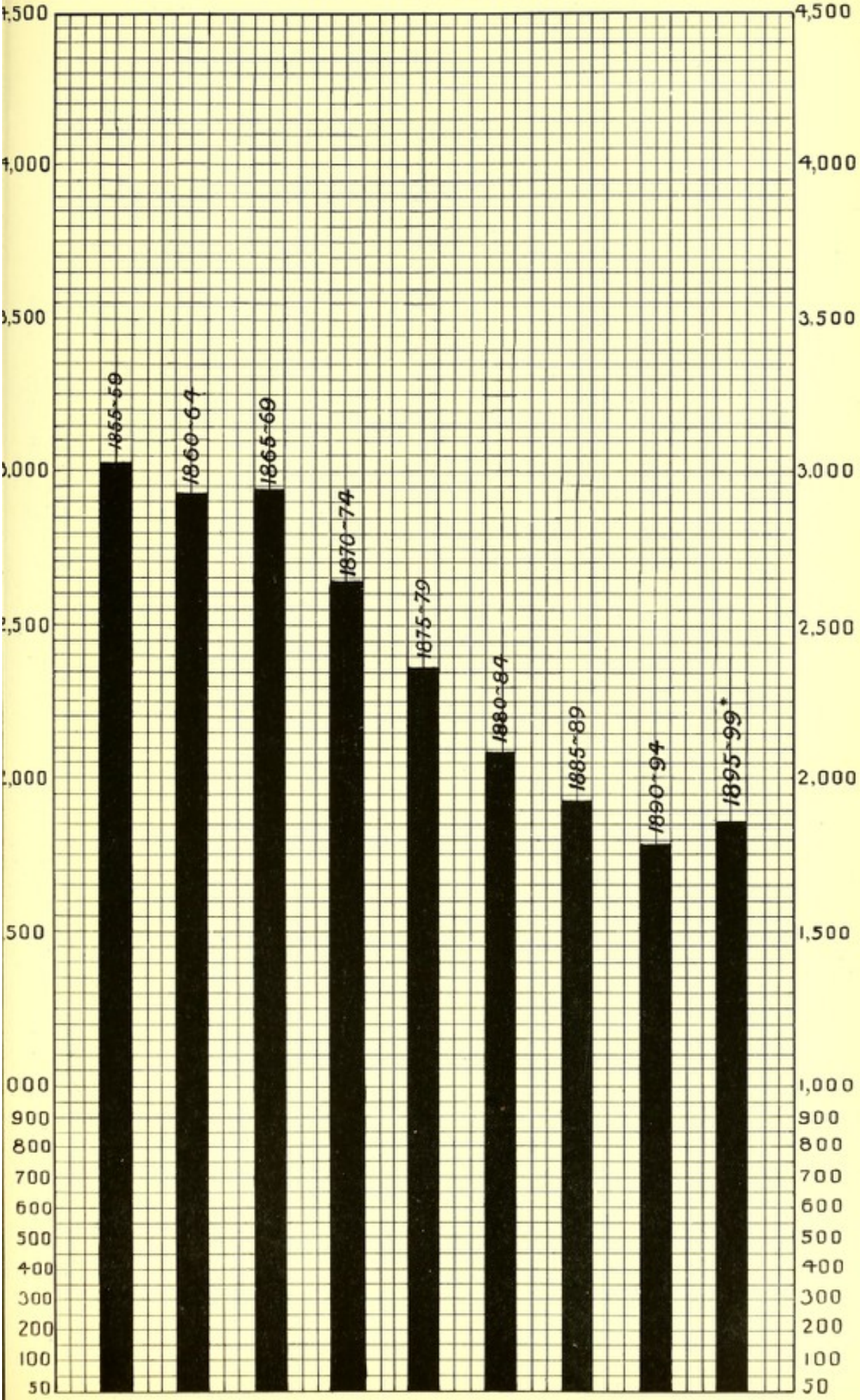
In Plate XVII *a.* we see the progress that has been made within our own borders during the past 45 years. It has been very distinct but has not proceeded at such a rapid rate as in Glasgow. But it must be remembered that we had not so high a death rate to begin with. Glasgow started with 3840, against our 3018 per million, and had thus a larger field from which to gather. We have, in point of fact, reduced the death rate from 3018 per million inhabitants in the quinquennium 1855-59 to 1851 in the quinquennium terminating with last year. Thus it is manifest that we too have reaped the benefit of city improvements in a large reduction of the death-rate from consumption as from other diseases. Let us take warning, however, that the last quinquennium has shown an upward tendency, and that we are actually not better but worse off than we were five years ago.

The Report of Sir Henry Littlejohn shews that the total number of deaths last year was 574. This is equivalent to a death-rate of 1910 per million, and from our experience during the half-year ending 30th June, it does not appear likely that we shall have lost fewer than 600 lives during the present year. Looking carefully at the details given in the Report, we shall find that of the 574 deaths 332 were males and 242 females. Of the total, 427 deaths occurred among people paying less than £20 of yearly rent. Only 147 occurred among people paying over that sum. We may conclude therefore that consumption is disappearing from among our better to do people and is now becoming largely a question affecting the artizan and working population.

The obstinacy which it has shewn during the past five years appears to warrant more drastic measures. It seems to have yielded as far as may be expected to external remedies, drainage, water supply and so forth. What is now required is that the disease should be followed up into its last retreats in the homes of our poorer people where it carries on its work of infection.

Adding the mortality caused by other forms of tuberculosis, Sir Henry's Report shews (page 82) that our total sacrifice to this preventable scourge during the past year was 790, or more than one-seventh of our mortality from all causes. This is the measure of the task that still lies before us, but we have seen that it is by no means a hopeless task.

COMPARATIVE TABLE of MORTALITY from PHTHISIS in EDINBURGH per MILLION INHABITANTS in QUINQUENNIAL PERIODS for 45 YEARS, 1855-99 inclusive.



* NOTE.—The actual number of Deaths during 1899 was 574.

IV. THE CURABILITY OF CONSUMPTION.

That people have been cured of consumption, and are being cured every day, is beyond dispute. But prevention is better than cure. Nowhere is the proverb more true than in the case of this disease. It assails a part of the body far too vital to be regarded otherwise than with concern. Infinitely better is it therefore to prevent the assault than to drive out the foe after he has begun his work of pulling down the citadel. But that he can be driven out before he obtains the absolute mastery is a fact well proved and settled. It has already been stated that in autopsies it has been frequently demonstrated that distinct traces of healed consumption occur in the lungs of persons whose death was to be attributed to wholly different causes. Anatomists dissecting bodies in institutions to which these are sent for scientific purposes are constantly finding traces of overcome tuberculosis where that disease could not in any way be identified with the cause of death. This observation has been made at morgues and mortuaries, where cases of death from violence or unascertained causes have to be investigated, in as many as from one-fifth to one-third of the whole cases inquired into. Sir Henry Littlejohn has stated that his experience confirms this observation.

Whatever is attempted in the way of effecting the cure of persons who have unfortunately fallen into decline must proceed upon well-defined lines:

It must be recognised that the enemy to be driven out is a living organism peculiarly sensitive to the influence of sunlight and to fresh air. Primary attention must therefore be given to the patient being provided with abundance of these natural elements.

The weaker the patient is the more the organism flourishes. Therefore the strength must be sustained by a generous diet.

There is no specific drug yet discovered that has any material effect upon the organism once it is within the system. All quack medicines therefore should be utterly discarded as cruel deceits.

No sort of treatment should be resorted to that has not been abundantly proved to be useful. A healthy natural condition should be maintained, and the patient should be encouraged to take all nourishing food that he can. All kinds of coddling and over solicitude are to be avoided, and the patient should,

within regulated limits of common sense, take free exercise and treat himself as a convalescent rather than an invalid.

We have seen with what hope administrators of public health may carry on their efforts to increase and render more effective the means for the prevention of consumption. It is a happy circumstance that, in efforts that may be made to cure the disease where it has taken place, a start can take place with the assurance that it does not spring from hereditary taint alone, whatever may be said about constitutional tendency. It is not an inborn disease that is to be combated. Its cause is known, and much is also known of the influences that make in its favour or against it. All treatment therefore should obviously be consistent with and based upon ascertained facts. And these facts all point to a complete departure from the old method of treatment. Formerly the patient was inclined to live under conditions which actually fostered and favoured the advance of his disease. He closed his windows and doors for fear of draughts; he wrapped himself in heavy clothing when he ventured to the open air even in fine weather; he weakened his appetite by avoiding exertion and by choosing to pass most of his time in a vitiated atmosphere; and with enfeebled appetite he thought himself unable to take hearty meals. He regarded himself as a weak man, though he generally hoped for improved health even if his hope was always deferred. The result was that recovery was so rare—at least among the poor—that it was hardly recognised. Mainly from the rational treatment practised by Brehmer and others, which recognised the advantages of fresh air and sunlight, men, after long years of doubt, began to see the reasonableness of hope. Still more, when the actual tubercle bacillus was revealed by Koch, the belief spread that, if the disease could be taken in hand in time, cure might be looked for.

It was seen that, in order to secure proper conditions in which successful treatment might be carried on, Brehmer and men like him were wise in setting apart places where affected people might be received and placed under proper regime. Brehmer's example, first presented in his Sanatorium at Görbersdorf in 1855, has only begun to bear much fruit. There were few consumptive sanatoria in Germany until the formation four or five years ago of the National Union for Combating Tuberculosis, in which the German Empress has taken an active part. Since then Sanatoria have grown up in the neighbourhood of every considerable German town. At present there is one in course of erection in Berlin which will receive as many as 1500 patients, 750 of each sex.

There has been a lively hope among bacteriologists that some means might be found by which, as in the disease of small-pox and rabies, patients might be immunised by inoculation. The tuberculin introduced by Koch in 1890 prematurely awakened world-wide expectation that had to be speedily abandoned. Koch and his followers have been working on with patient assiduity. Three years ago he produced another and improved form of tuberculin. It cannot be said to be effective in the treatment of consumption, but in cattle it has proved a highly valuable—if perhaps not always an absolutely reliable—test, and is so far playing the part of a useful prophylactic. Medical testimony is not strong as to the possibility of its success in the human subject. Good results are reported from some hospitals, but bad results from others. Nevertheless investigations go forward, and there are many able men at work on them, each inspired with the hope that he may have the joy of producing the antitoxin that may prove to be the magic wand that will dismiss the evil from among men.

It would of course be out of the question to neglect the means that lie to hand and wait for the inbringing of a new specific. Therefore, since it has been proved that under the well ordered conditions that have prevailed in some of the earlier sanatoria many patients have been relieved and some cured, it is only right to make such provision as may be needful till surer and quicker means of cure are found. Every day patients are falling ill and calling for help. They must be assisted with such means as are available. It is not for us to busy ourselves too much with what the future may have in store for its own sufferers. Patients of the present time are not to be consoled with the hope of what is distant and uncertain. The elements of the new treatment which has been named the open-air cure consist in good air—free from dust—sleeping with open windows at night, walking, or resting in shelters open to the air through the day, plentiful nutrition, exercise graduated to the strength, and methodical training of the patient to the observance of the rules of health that are known to have the best influence on his condition.

Perhaps among the most remarkable results of this new treatment are some which have been obtained at Nordrach in the Black Forest, under Dr Walther. The place illustrates the unspeakable advantage that patients enjoy who have the good fortune to come under the control of a physician of strongly marked individuality, who has the power of a gentle but irresistible insistence on obedience to his orders. No one who has seen patients who have passed under Dr Walther's hands,

and who has satisfied himself of their previous physical history, their night sweats, low appetite, feeble condition, and the actual presence of bacilli in their expectoration, will any longer doubt that consumption is a curable disease. To see is to believe, and men are now in our own neighbourhood who were pronounced consumptives before they went to Nordrach, but returned completely cured, and who have resumed and continued at their ordinary callings for years without a trace or sign of any return of the disease. It hardly needs to be said that, as the disease consists in the breaking down of lung tissue—a process which goes on steadily, if, as a rule, slowly, there must come a time when so much tissue has been destroyed as to make healing and recovery impossible. What is necessary therefore is to provide for cure at the first stage of invasion. The first attack of the disease can now be ascertained with accuracy through simple experiments made possible by Koch's brilliant discovery. It is only needful to send a portion of the sputum of the patient to the proper authority to be tested for the presence of the tubercle bacillus. If it is present, so is consumption, and the patient may forthwith take steps to seek an effective cure.

Climate no longer takes the place which it used to hold in the minds of physicians in the treatment of the disease. High and dry latitudes used to be regarded as the best resorts for consumption. But Görbersdorf, Dr Brehmer's celebrated institution, lies comparatively low, and it is believed to show as high —if not a higher—proportion of cures as Davos Platz in Switzerland, which lies far above the same level. This becomes an important fact when it is remembered how largely consumption is now a working man's question, and how many poor people, if they had to resort to high altitudes for cure, could never hope to be cured at all. Not only the knowledge of curability but the possibility of cure is thus brought within the reach of all. Experiments have shown conclusively that animals inoculated with the tubercle bacillus do not make a better or quicker recovery among the health resorts of Switzerland than they do in the atmosphere of the Koch Institute at Berlin. No doubt the purer air of the mountains must not be despised, yet if pure air can be found elsewhere, the cure under proper treatment can be effected as well in low as in high lands, and as well in lands that are wet as in heights that are dry. Therefore climate in itself is neither an absolute condition of cure nor a sure remedy.

Professor von Leyden points out that the same conclusion must be drawn from the fact that the reputation of having a healing effect is not confined to the climate of mountainous

regions. Southern climates, he says, compete with the mountain air, and innumerable sufferers from tuberculosis still seek health in the warmth of southern lands. The excellent healing influences of the sea climate against tuberculosis is also celebrated by many who attribute it to the damp and dustless atmosphere. A not inconsiderable number of Sanatoria are built on islands. Sea voyages are repeatedly and urgently recommended for consumptives; and a Russian physician, Dr Motschutkowski, has suggested the idea of fitting out ships for such patients which visit the places reputed to be climatically most favourable, and each at the best season of the year. But von Leyden repeats that the climate of these places has no specific effect whatever. Upon this question of the new treatment of consumption, the following further observations of von Leyden may be quoted because they contain some reassuring considerations, especially for patients of limited means :—

"The natives of Egypt, where many consumptive patients seek health, and whose climate is praised by many, are not immune. The Hottentots of South Africa, which Livingstone declared to be free of tuberculosis, sometimes suffered from the disease in its most vehement forms, and the like may be said of all other climates. I do not mean, however, to question their utility, any more than I questioned that of mountain-climates; only their specific healing effect, only their absolute necessity for the cure of tuberculosis, is open to dispute.

"If we now inquire whether we can treat our patients with equal or almost equal success in our own climates, far away from the health-resorts so frequently visited and praised, we are at liberty to give this question an emphatically *affirmative* answer. In our climate too we can give the patient good dustless air and a situation protected against cutting winds. I go so far as to maintain that it is better for many patients not to go far away from their homes, for those who have lived long in the south, and have wholly or nearly recovered there, expose themselves when they return to their native land in the north to the great danger of catching cold, especially in winter; and as but few of them can always spend the winter in southern climates, a great part of the gained ground is lost again as soon as they come home. To the mountain-sanatoria, indeed, this objection does not apply, and that is in my opinion a reason for preferring them to others.

"Unquestionably a not inconsiderable advantage is gained if we can improve the health of the patient in the climate, or at least near the climate, in which he is afterwards to live. I am not alone in this opinion; it has been expressed by other physicians experienced in the treatment of phthisis. In a very noteworthy lecture, Herr Knopf of New York expressed himself as follows: 'I do not believe in the specific effect of any climate, but I think it very essential that the majority of tubercular patients be treated and cured in the climate in which they have afterwards to live and work. Sanatoria for consumptive patients should therefore be erected at places easily accessible from the great centres of population.'

"The effect of the atmosphere on sick people and on diseases is a somewhat mythical thing. Like climatic treatment, it is based on the opinion that the cause of many diseases has lain in the air, and that the

patient must be removed from the air in which he has got ill. Better air would bring him a less quantity of morbid matter, and his disease would be cured. So specific healing influences have been ascribed to the air.

"Such opinions are no longer tenable. Even the best and purest air cannot prevent the development of tubercle bacilli that have once got into the body. A specific effect, therefore, cannot be ascribed to the air either, but only such an effect as that which gives it a place in Brehmer's treatment. It is a hygienically important means which may have a refreshing effect on the whole organism, on the spirits, on the power of resistance. The application of air in the long air-cure introduced by Dettweiler, and in the lying-halls is one of the hardening measures, the patients being inured to the fresh air and accustomed not to let themselves be frightened into their rooms by every draught. Thus the free and bold use of fresh air is of great importance. Air that is to have a curing effect must of course be as pure as possible, *i.e.* especially free of exhalations and dust; it must also be in motion but not stormy, and not exposed to great variations of temperature. The evening air is justly considered the most dangerous, on the Riviera, for instance, in damp meadows, and near lakes, owing to the sudden changes of temperature and the consequent development of mist.

"*Nutrition.*—Great importance is attached nowadays, and this too in conjunction with Brehmer's method, to the nutrition of tubercular patients; the days when, like other fever patients, they were stinted in their food, are long past. Experience showed that tubercular patients are better when they increase in weight, worse when the contrary is the case, and Brehmer concluded from this that they ought to be well fed. He made the just remark that most consumptive patients are constitutionally poor eaters. He used by preference fatty articles of nourishment, especially cod-liver oil and rich milk, and made an extensive use of alcoholic liquors. The diet now in vogue differs somewhat from this; it is freer, more methodical, and more purpose-like. It is not satisfied with the general conception of 'good nourishment,' it aims at nourishing the patient so that he may gain weight, that he may at least recover the weight he had before he fell ill, or even gain a little more.

"An important point in Brehmer's treatment is hardening, and I mention it in order to lay very great stress upon it. In this point the hygienico-dietetic treatment stands face to face with the specific treatment, and is, we are entitled to say, superior to it. The latter combats the causes of the disease; its success is secured only when it can certainly and permanently kill the cause of the disease, the tubercle bacillus, and thus give the sick body a sure and permanent immunity. Hardening, on the other hand, aims at strengthening the sick body to such an extent that it gains in power to resist the disease, that it not only bears but also overcomes it. This hardening method has recently gained great recognition in the treatment of other diseases also, and I entirely agree with its advocates. As opposed to that coddling which is so frequent among the sick, and which is favoured by the affection of their families and also partly by the humanity of their doctors, hardening is an important corrective, and contributes not a little not only to the conquering of disease but also to its prevention.

"*The hardening treatment* consists in the free enjoyment of air without, or with much diminished, fear of catching cold, and the already mentioned *long-continued air cure*—lying in airy halls, sleeping with open (half open) windows, going out in all weathers—falls under this head. *Hydrotherapy* (cold ablutions, affusions, wet packings, douches, and even short cold baths) is an important means of hardening.

"*Bodily exercises*—walking and methodical mountain-climbing—profit much. These exercises must be duly supervised and enhanced. To them may be added riding, rowing, cycling, gymnastics, golf, which may well be permitted to tubercular patients in moderation and with gradual enhancement. Caution, of course, is necessary, especially in the case of weak patients; over-exertion and over-heating must be carefully avoided.

"The doctrine of Rest for tubercular patients has been preached again of late, but it is requisite and recommendable only for weak patients and for those who are very ill. Even such patients one must try very gradually to strengthen and harden. Hardening strengthens the body, promotes assimilation, and enhances the psychical and moral power of resistance.

"These are the elements of Brehmer's methods.

"The treatment itself is systematic and educative; it requires the supervision and instruction of the patient regarding his way of life all day long. It is generally recognised that it is hardly possible to carry out such systematic treatment successfully except in establishments expressly devoted to the purpose.

"If one were asked, however, whether treatment in such an establishment is absolutely necessary, one would have to admit that the same results may be obtained elsewhere, but unquestionably with greater difficulty and only under specially favourable conditions. Many patients have a decided aversion to entering a medical establishment, partly because they do not like to be together with other tubercular patients, partly because they dislike the more or less necessary compulsion, in short, residence in such an establishment is so uncongenial to them that they refuse to go, and prefer other less certain cures. It is the task of their doctors to secure such patients also, as far as possible, all the advantages of Brehmer's treatment, and there can be no doubt that this can be done, if the patient is in a position to do everything for himself, and also possesses will and intelligence enough to do it. The possibility of free treatment, with results as favourable as those obtained in special establishments, I will not dispute, but it demands much more composure and time on the doctor's part, and success is not so sure. In every case, even under the most favourable conditions in other respects, I think it highly advantageous for the patient if he can at least once or twice spend several weeks or months in a good medical establishment. In difficult cases—*i.e.* when the difficulty lay in the character and will of the patients—I have, when I did not at once insist too abruptly on having my will, gradually succeeded in inducing them to enter such establishments, and they were almost always satisfied afterwards with the result.

"On a large scale especially—*i.e.* for very many patients—the free method of treatment is too difficult. If, therefore, the enterprise is to combat tuberculosis on a great scale, and to give the thousands of poor patients the benefit of Brehmer's treatment, the only hope of success lies in the erection of special establishments for the poor. Many minds are now working with keen interest for the attainment of this end."

There are not many sanatoria for consumptives in the British Islands, but it may be hoped that before long this country will learn from the results coming from the German sanatoria that we too must join in this great effort for the extermination of the disease.

On the Continent the tendency is to restrict the sanatoria,

properly so called, to the reception of cases that are reasonably hopeful as not being too far advanced, leaving the hopeless cases to be cared for by public authorities or private benevolence.

The work has not yet been sufficiently long in operation to enable a full estimate of probable results to be made. So far as it has gone, however, the experience of the past three years seems to shew that in early cases a residence of from ten to twelve weeks is sufficient to render a patient fit to resume work with a fair prospect of permanent cure, while a longer residence is necessary in cases where the disease is further advanced.

In Germany most of the Sanatoria recently erected are supported in whole or in part by the State Union for insurance against sickness. The Union has already found that it is much more economical to pay for the support of its sick members for a few weeks or months at the beginning of their illness, and to cure them so that they return to work and resume payment of their premiums than to follow the old practice of allowing them to work as long as they were able and then pay them sick allowance during an indefinite period till they died.

As evidence accumulates to prove what can be done to effect a cure in early cases, we may rely that the public imagination will be touched and men will take heart of hope and realise the great possibilities of cure for those who not long ago would have been regarded as given over to death. If, as will be proposed in this Report, the Municipality will recognise its duty in the interest of public health towards extreme and dangerous cases, we may reckon with confidence upon the more hopeful cases being provided for by the wise liberality of those who will be ready enough to supply the means for such a beneficent cause.

VI. DUTIES OF MUNICIPALITIES TOWARDS EXTIRPATION OF CONSUMPTION.

What then are the duties that seem, from the state of facts now described, to be incumbent upon municipalities as guardians of the public health?

Probably the following will commend themselves without further demonstration:—

1. The devising of means to inform the public regarding the origin of consumption and its main characteristics. Information of this sort is best provided by the circulation in the dwellings of the citizens, especially of the poor, of sheets setting out, as has been done for Edinburgh by Sir Henry D. Littlejohn, the conditions that help to spread the disease and those by which it can be best avoided.

2. The adoption of a satisfactory method of disinfection. In Dublin, Glasgow, Bristol, Dundee, Liverpool, and Manchester, as well as in Edinburgh, the Public Health Departments are ready, upon being called upon, to disinfect any dwelling where a case of consumption has occurred. It is worthy of consideration whether, in the case of death from consumption, the house should not be compulsorily disinfected, if the Medical Officer of Health declare that to be necessary.

3. The encouragement of the public to take the earliest note of any sign of consumption and to call in a doctor who may, in any suspected case, obtain a bacteriological report on whether the patient is tuberculous or not.

About these three propositions there will be no dispute. In effect they are already in practice in Edinburgh.

Your Committee do not meanwhile see sufficient cause to recommend the introduction of notification of the disease in Edinburgh. They are of opinion that as places and means of healing are provided, sufferers will voluntarily offer themselves for all available relief.

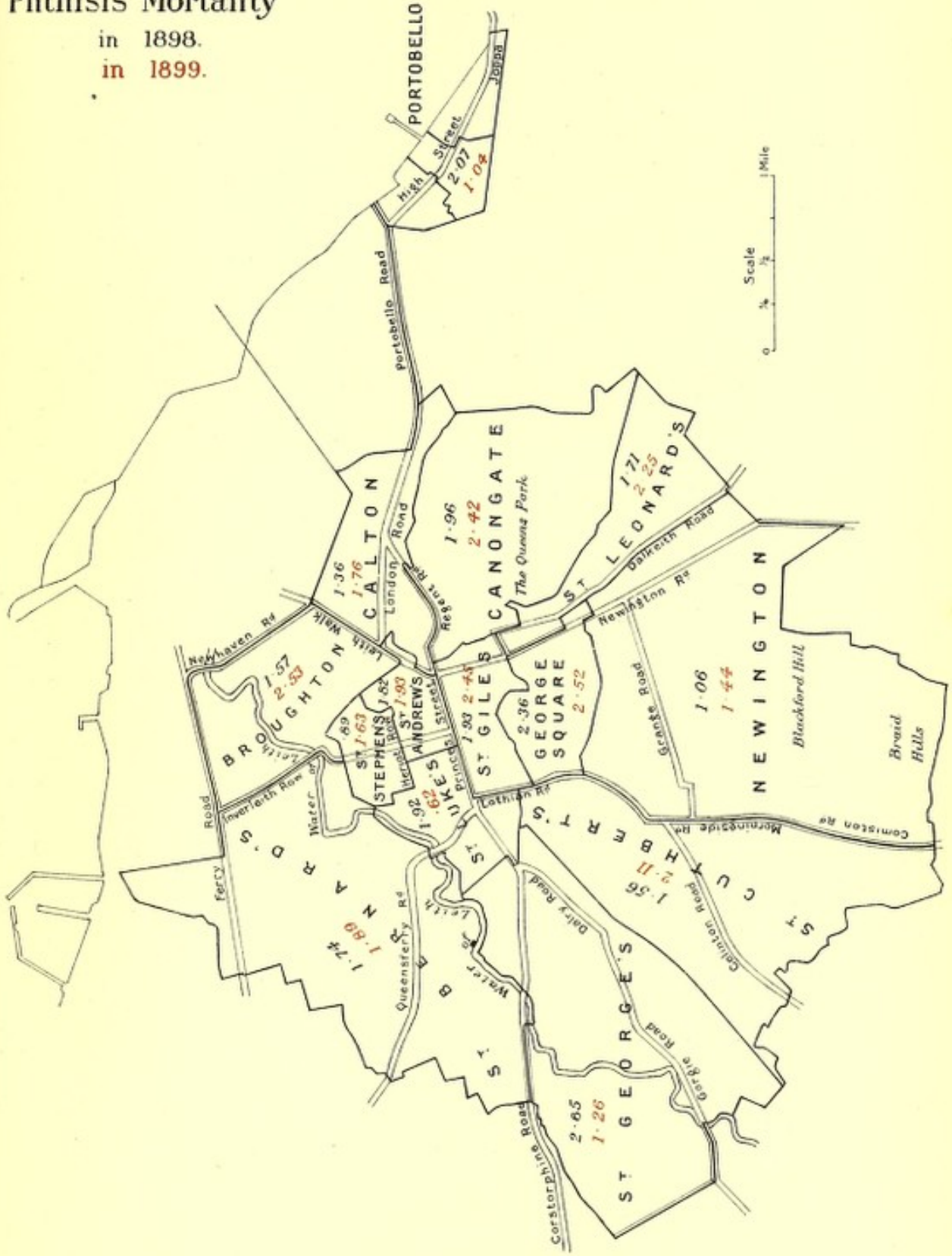
Upon the present study of the question and, in particular, upon the information supplied by Sir Henry D. Littlejohn, Medical Officer of Health, and subjoined to this report, your Committee have come to the conclusion that there is a plain duty incumbent upon the Town Council to devise means to deal with cases in the last stages of the disease which are to be found in houses of inadequate accommodation.

Sir Henry's report shows the occupation, residence, age, and sex of all the persons who died from consumption during 1899, and their distribution through the city. Plate XVIII. shows an outline plan of the city to illustrate Sir Henry's report, and shows various wards marked with the

rates per thousand of population for years 1898 and 1899 respectively. The mortality is highest where impurity is greatest. Broughton, George Square, St Giles, Canongate, and St Leonards contain the poorest people and the largest proportional number of insanitary houses. When citizens fall into consumption and become unfit for work, what takes place is that the poor invalid spends his or her closing months or weeks in the confined accommodation of his house. Supplies fall short because the invalid himself, who may be the bread-winner of the family, is necessarily out of employment. The wife and children have to try to add to the resources by going out to earn the means to live, the children frequently having to go to work before their years warrant it. Perhaps a lodger takes up part of the already too small accommodation, and may himself be exposed to infection. For undoubtedly infection is present in the over-crowded, ill-ventilated place. It is well known that in the last stages the patient is discharging by his cough and spit innumerable bacilli, and in such an atmosphere as usually prevails he cannot avoid in his weak state being a source of powerful infection to those around. The chances are that he will infect one or more of his own family who are attending upon him. Thus the disease is spread and life is lost. No doubt we do not suffer from consumption as we did in the time before the present sanitary arrangements were introduced. We have improved our drainage and increased our water supply; we have applied more stringent regulations for light and air in new houses; and we have to some extent improved the dwellings of the working classes. We have made fairly clean the outside of the cup and platter and we have reaped a certain measure of reward in a diminished death-rate from consumption as from other infectious diseases. But we have not yet followed up consumption into its final strongholds in the dwellings of the poor.

As has been said, this has become pre-eminently a working-man's question. Sir Henry's report, if we examine the details, shews that 574 persons died in Edinburgh last year from consumption alone. Last year the total number of deaths from all the fevers, including whooping cough, only amounted to 400; the average age of the victims of consumption was nearly 33, while that of the persons who died of the fevers was not more than 10 years. Of the people who died from consumption more than three-fifths inhabited houses of one, two, or three rooms; the home in no case exceeding £20 of rent. Presumably the most of those were ratepayers assisting, till they were no longer able to assist, in bearing the public burdens of the city. If they had taken ill of fever they would have been entitled to

WARDS OF THE CITY
with
Phthisis Mortality
in 1898.
in 1899.



the benefit of the City Hospital, so that they might be cured and the public protected against the spread of infection. But though in consumption they have suffered from a more deadly disease, the municipality has as yet made no direct effort to meet their case, and to protect the public from the infectious influences which they have caused and have been helpless to prevent.

This is not a question of philanthropy, nor does it seem to be a fair one for the Parish Council. By far the greater number of those who thus die among us every year are hard-working people, following various honest trades. As a rule, they have paid their rates till the last. A pauper's end would be an unhappy addition to the distress of being taken away in the prime of life and leaving those dependent on them to the mercy of the world.

If the town is to deal with those cases, it must do so, as has been said, upon purely public and not on benevolent grounds. The town cannot set up for the exercise of benevolence, but it can justify on economic grounds the protection of the lives of citizens from the great danger of a powerful infection. This is the principle upon which it carries on a hospital for the reception of persons afflicted with infectious disease. It is true there are municipalities where it is recognised to be a duty to take over the charge of citizens just entering upon consumption, where the expenditure upon effecting the cure of such persons is justified on economic grounds, upon the ground that those saved lives will prove as workers and wage-earners of far more value to the community than if they had been allowed to die. The Committee do not venture to make any such proposal. They believe that, if those dangerous cases which have got beyond the range of cure were provided for, the probabilities of a diminution of the disease in our city would be vastly improved; and that as the hopefulness of cure at the earlier stages of the disease comes to be realised and understood, it will be found that hardly any stronger case will appeal to wealthy and benevolent citizens, than the great possibility of saving young and promising lives.

It appears to the Committee that the means of meeting the duty now suggested lies ready to the hands of the Town Council. Sir Henry Littlejohn suggests in his report that it would be well if provision were made for the reception of a hundred cases of persons in the last stages of consumption. In a short time the present Infectious Diseases Hospital will be removed to the new Fever Hospital at Colinton Mains, and the present buildings will be set free. The Committee venture to suggest for the consideration of the Town Council whether the present building, or part of it, with its complete kitchen and laundry accommodation, might not be retained

and, at small cost, fitted up with a hundred beds. The cost, upon the experience during the past few years, would not exceed £50 per bed, or an annual expenditure of £5000. The result would be the immediate abstraction of a hundred sources of dangerous infection. Unhappily, patients who have come to that stage have only a short expectation of life. In a similar institution under the municipality of Paris the experience is that the average life of such patients received into hospital is only three months. That would mean an admission of 400 patients in the course of a year. But even if only 200 patients were received in a year, this would imply a very large reduction of dangerous risk to the lieges. Centrally situated, the Hospital would be accessible to the parts of the city where cases of consumption most commonly occur, and as there would be almost no risk of infection in an hospital conducted as it would be, relatives of patients could be allowed to visit their friends more freely than can be permitted in a hospital for the acute fevers.

But may the city look for an adequate return for such an addition to its annual burdens? It may be respectfully answered that upon the evidence of figures set forth in this report there is no expenditure of public money more likely to yield an ample and immediate return. It is not unreasonable to expect that in the way suggested within ten years the mortality from consumption in Edinburgh will be reduced by 200 per annum. But, if only 100 lives were saved to the community, it may be claimed that the expenditure would be justified. Upon the experience of last year, the average age at which we lose our people through consumption being about 33, it may be reckoned that each saved life may be taken as good for ten years of labour. There is good authority for taking the annual wage earning power of each citizen at £35, and £35 capitalised at ten years' purchase would give £350 for each saved life. If the mortality were reduced by only 100 lives, the saving per annum would then be £35,000, which must be admitted to be ample return upon an annual expenditure of £5000. To this saving there should be added the further saving of sickbed expenses and loss of wages of the victim.

The Committee respectfully direct the attention of the Town Council to the excellent Report of Sir Henry Littlejohn, and to the Report of the Conference with Representatives of the Medical Faculty of the University, the Royal Colleges of Physicians and Surgeons, and the Veterinary Colleges, and also to the Recommendations of these bodies, all which are presented in Part II. of this Report.

Humbly reported by the Special Committee.

JAMES POLLARD, *Convener.*

EDINBURGH, 23*rd July* 1900.

PART II.

1. REPORT BY SIR H. D. LITTLEJOHN, M.D., LL.D., MEDICAL OFFICER OF HEALTH.

2. CONFERENCE HELD BY SPECIAL COMMITTEE WITH LEADING MEDICAL MEN AND SURGEONS.

3. RECOMMENDATIONS FROM MEDICAL MEN.

I.

REPORT by the Medical Officer of Health on Pulmonary Consumption in the City, with Appendices giving the Residences, Sex, Age, and Rental of Houses of Fatal Cases of Consumption, arranged according to the Wards in the City. Also Statistics as to the Rate of Mortality at Various Ages, together with the Occupations of the Patients, with the Mortality in their Respective Families.

It is now fully recognised that the mortality from Pulmonary Consumption has been decreasing throughout the kingdom, both in urban and rural districts.

In Edinburgh this has been due to the great clearances that have been effected during the last thirty years in the older parts of the City, to the improved drainage, and to the better feeding of the working and poorer classes, and there can be little doubt that the persistent efforts made by the Corporation to provide out-of-door recreation for the working classes have been of immense benefit. The Public Baths and Wash-Houses have also powerfully aided in promoting habits of cleanliness in the poorer Wards of the City.

The following Table shows the City mortality from Pulmonary Consumption in two periods of ten and twelve years respectively, and contrasts this with the total mortality, and also that from ordinary infectious diseases.

TABLE I.—Showing the Population of the City during the last Twenty-two Years, the total Mortality and the Deaths from Phthisis and from Zymotic Diseases.

Year.	Population.	Total Deaths.	Deaths from Phthisis.	Deaths from Zymotic Diseases.
1878	219,722	4676	545	585
1879	222,859	4195	519	356
1880	225,996	4694	468	805
1881	229,157	4308	492	569
1882	232,445	4292	509	425
1883	235,744	4275	485	446
1884	239,032	4556	455	555
1885	242,320	4241	514	307
1886	245,608	4555	490	380
1887	248,896	4824	491	599
	Total . . .	44,616	4968	5027
	Death-rate per 1000	19·0	2·1	2·1
1888	252,184	4374	458	306
1889	255,472	4415	459	419
1890	258,760	4999	532	695
1891	262,048	5257	513	384
1892	264,788	4746	480	641
1893	267,672	4830	465	459
1894	270,588	4350	469	395
1895	273,535	5246	555	511
1896	276,514	4275	455	277
1897	292,364	5782	570	705
1898	295,628	5320	529	413
1899	298,927	5396	574	400
	Total . . .	59,440	6059	5605
	Death-rate per 1000	18·1	1·85	1·70

What can be done in a City like Edinburgh still further to lessen the ravages of this great scourge?

1. In the first place, the Corporation must continue the improvements of all insanitary areas. It is to be regretted that it has been found impracticable so far to proceed with the two clamant cases which I officially certified to the Town Council, viz., the districts of Greenside and Simon Square, in both of which the poor are lodged so as to be a menace to the rest of the population. The sudden outbreak of Typhus in the Simon Square district has emphasised in a striking manner the urgent necessity of dealing summarily with the rookeries there. The squalor, the imperfect light and ventilation, the intemperance—all favouring the outbreak of infectious disease, such as Typhus—are powerful factors in the production of Consumption.

2. The common stairs—the avenues of fresh air into the sub-divided dwellings of our tenements—should be more regularly cleansed. For this purpose every common stair in the Old Town should be examined by a competent inspector twice a week, and its condition reported; while those in the better parts of the City should be visited once a month. The importance of this cannot be over-estimated, when we observe the amount of dust which is allowed to accumulate in the stairs, and which is, so to speak, driven as if by a fan into the interior of the dwellings.

The great Dr John Brown, in lecturing to the poor, said years ago:—"There is one thing I have forgot to mention, and that is about keeping "common stairs clean; you know they are often abominably filthy, and they "aggravate fever and many of your worst and most deadly diseases; for you "may keep your own houses ever so clean and tidy, but if the common stair is "not kept clean too, all its foul air comes into your rooms, and into your lungs "and poisons you."

The balcony arrangement, now generally adopted in our tenement houses built for the working classes, has proved a great advantage so far as the spread of ordinary infectious disease is concerned, and there can be no doubt that, in the case of Consumption, it is equally beneficial. A reference to the cases recorded in the Canongate will show that no death occurred in the oldest of our balcony tenements, viz.:—Viewcraig Row and Prince Albert Buildings, with a population 1325.

3. Owing to the scarcity of water, the dust in our closes and streets is not sufficiently dealt with. Twice a day the closes should be flushed, and the streets should be more frequently watered. To see our carefully filtered water used for such purposes has appeared to me to be a waste of good material, and I am convinced that the time will come when sea water will be pumped to the comparatively unknown reservoir, of large dimensions, in the Castle Hill, whence it could be conveyed in all directions, and prove useful in flushing our closes, watering the streets, and extinguishing fires. It is said that five to seven years will elapse before the citizens get the full benefit of the pure supply of the Talla. Surely in that time some use might be made of the waters of the Forth.

So far as Public Baths are concerned, the very poorest class has not had its wants attended to. There should be Baths provided for the labourer. Nothing would tend more to wean him from the ale-shop than the opportunity afforded him, either free of expense or at a merely nominal sum, of having a cool and refreshing wash when he returns from his work. His temper would be improved, and I am convinced that the chance of family disagreements would be lessened; but, of more importance, his health would be more stable, and he would be better fitted to resist the inroads of disease. The poor are too often imperfectly attired, and they refuse to expose themselves in our Public Baths as at present constituted.

4. The time has now arrived when something must be done by notices and handbills to lessen the habit of spitting which, owing to the prevalence of smoking at all ages, is largely on the increase in our streets, in our cars, and in railway carriages. In all these public places, notices should be put up calling attention to the habit, and begging the citizens to insist on stopping a disgusting and, so far as Consumption is concerned, a dangerous practice.

5. In addition, handbills should be distributed by our city missionaries, biblewomen, nurses of all kinds, and students at the various dispensaries, calling attention to the risk of allowing the expectoration of patients affected with Pulmonary Consumption to fall on the floor or on any surface where it dries and passes into the air in the form of fine dust. I append for the information of the Committee a form of leaflet which might be issued.

[PROPOSED LEAFLET.]

"PULMONARY CONSUMPTION.

"The Health Committee of the Town Council beg to impress on Citizens "the importance of never allowing expectoration to fall on any part of the house. "This is specially to be guarded against in the case of PULMONARY CONSUMPTION, "which is now regarded by the medical profession as highly infectious when the "expectoration of the patient is allowed to dry on any surface and to be carried "in the form of dust into the air. *By breathing this air the disease is readily "communicated.*

"It is also known that *light and fresh air* tend to destroy this infective "material. Hence the importance of attending to what is in every person's "power, viz., securing, as far as possible, the entrance of *light* and *fresh air* into "the apartment of the sick.

"*Domestic cleanliness is of prime importance.* Patients should be provided "with spittoons containing some disinfectant such as a solution of carbolic acid. "These should be cleansed from time to time, or where pieces of rag or paper are "used for the purpose these should at once be destroyed by burning.

"*Slight colds* should not be neglected.

"The Health Committee have given instructions that citizens, on applying "at the Health Office, should have the bedding, &c., &c., used by consumptive "patients *disinfected* free of charge, and, in the event of removal or death, that "the room should also be *disinfected.*

"In families with young children it is recommended that, wherever practic- "able, the *milk* should be boiled or sterilized in a suitable apparatus."

6. But the question may be asked, Is it not possible to stamp out this disease, as we are able to do in the case of smallpox, typhus, and other infectious diseases? So far as tuberculosis exists in our cow-houses and herds, it is possible to eradicate it at an enormous expense for compensation by killing every animal which shows the slightest signs of the disease. Of course, in the human subject such a method is out of the question, and, unfortunately, the duration of the disease, differing so widely from other infectious ailments, renders the system of notification of little or no use in preventing the ravages of consumption. I have by way of illustration taken the deaths from phthisis in the City from 1st January to 30th September of the present year, arranged them in Wards, giving the address of each case, tabulating the age and sex, and at the same time, in order to afford some idea of the circumstances in which the cases occurred, I have appended the rental of the house in which the patient died. Edinburgh does not afford a wide field for determining the effect of industrial occupation on consumption, but I have given the occupation of each case wherever possible.

COMPARATIVE STATEMENT of the Mortality from Consumption and Zymotic Diseases in the Various Wards of the City during the Year 1899.

Number.	Ward.	No. of Cases.	Per 1000.
IV.	St George's . . .	38	1·26
XI.	George Square . . .	73	2·52
XIV., XV., XVI.	Portobello . . .	10	1·04
VIII.	Canongate . . .	54	2·42
IX.	St Giles'	60	2·45
VI.	St Luke's . . .	10	0·62
VII.	St Andrew's . . .	27	1·93
III.	St Bernard's . . .	32	1·89
XII.	St Leonard's . . .	50	2·25
II.	Broughton . . .	33	2·53
X.	St Cuthbert's . . .	68	2·11
I.	Calton	46	1·76
XIII.	Newington . . .	51	1·44
V.	St Stephen's . . .	22	1·63
	Total . .	574	1·92

ZYMOTIC MORTALITY.

Total 400 = 1·33 per 1000.

Comprising—

Typhus	3
Typhoid	39
Diphtheria	28
Scarlet Fever	50
Measles	82
Hooping Cough	192
Erysipelas	6
	400

STATEMENT of Total Mortality from Tubercular Diseases during the Year 1899.

	Under 10 Years.	Over 10 Years.	Totals.
Tubercular Disease—			
Of the Head	118	16	134
Do. Spine	3	4	7
Do. Abdomen	41	19	60
Do. Joints and Bones	1	6	7
General Tuberculosis	5	3	8
Total	168	48	216
Pulmonary Tuberculosis (Phthisis)	43	531	574
Total Mortality	211	579	790

The above figures show a death-rate of 2·64 per 1000 of the estimated population, or 14·64 per cent. (over one-seventh) of the total Mortality for the Year from all causes = 5396.

AGE.

In Table II. (Appendix B, page 100), the deaths in each Ward have been classified according to four age periods, which have been chosen as approximately representing childhood, youth, the period of full adult vigour, and that when the vitality begins to be lowered. Taking the deaths as a whole, we find that the mortality per 1000 of the population under 15 years of age is ·70; and that in the second period, from 15 to 25 years of age, it is 2·02; while as life advances it reaches its maximum of 2·96 between 25 and 45, and is slightly less, 2·19, after 45 years of age. These figures correspond with what has been made out by previous observers.

As regards the death-rate in the individual Wards, we find very considerable variations, but it must be remembered the smallness of the figures dealt with and the short period of time under observation must tend to make us cautious in drawing general conclusions or attaching too much importance to the varying mortality indicated.

The mortality per 1000 of the whole population of the City is 1·92, which, if a true index death-rate from Phthisis in the town, must be considered low and favourable in comparison with the corresponding death-rate of other large towns in the country.

Taking the thirteen Wards of the City proper, and counting the three Portobello Wards as one, we see that nine Wards have a death-rate per 1000 of their estimated population lower than the general rate for the whole City, while the other five, viz., Broughton, St Giles', George Square, St Leonard's, and Canongate, with death-rates of 2·53, 2·45, 2·52, 2·25, and 2·42 respectively, are all considerably higher.

SEX.

So far as sex is concerned, it is found, as the statistics of other towns have shown, that the disease causes a larger mortality amongst males than females, due, probably, to a greater incidence of the disease amongst the former, and not to a higher death-rate. Of the 574 cases dealt with in this Report, 332 were males and 242 females, and if we have regard to the individual Wards it will be seen that this relative proportion of the sexes is fairly constant. In the Canongate and St Giles' Wards nearly three-fourths of the deaths occurred in houses under £10 rental. This will not, however, explain the large proportion of males who succumbed, and, indeed, it rather tends to indicate that the cause of the large mortality amongst males must be looked for in other conditions than the house surroundings and dwellings.

RENTAL.

DEATHS FROM PHTHISIS during the year 1899, shown according to Rentals.

Under £5	32
£5 and under £10	198
£10 „ £15	114
£15 „ £20	83
£20 „ £30	64
£30 „ £40	15
£40 „ £50	8
£50 and upwards	19
	533

Note.—41 deaths of persons who died in Public Institutions or Common Lodging-Houses are not included in the above.

In the above Table we are enabled to obtain a proximate idea of the social status of those who have succumbed to the disease, and to some extent also of the sanitary surroundings of the affected households. While it may not be wise to draw a rigid conclusion that lower rental necessarily means defective sanitary surroundings and more unhealthy conditions of life than in higher rented property, yet a consideration of the above Table irresistibly suggests the proposition, and we know that the classes who inhabit the lowest rented property in the city, live, for the most part, under conditions of poverty, deficient nourishment, intemperance, and neglect of cleanliness, which, in addition to the sanitary state of their houses and surroundings, must exercise great influence upon their ability to withstand disease. In higher rented houses the diminution is very marked, and is a fact which is of importance in relation to the question of the adoption of measures to combat the spread of the disease.

MUNICIPAL INTERPOSITION.

But the question may be asked, Can the Corporation interfere with beneficial effect in the course of this disease? If we take the case of a young man who becomes affected. The symptoms at first are often undecided, and after attendance as an out-patient at our infirmary or dispensaries he finds that his strength is so impaired that he can no longer work at his trade. Meanwhile, his pecuniary resources have been dried up, and if he has a wife and family to support, the depression of mind thus caused tends to aggravate the disease. If friends assist him, he remains a confirmed invalid in his house, and spreads the infection on all sides. To propose to such a one removal to the Parochial Hospital is generally indignantly rejected, and no wonder, when we remember that he must leave his wife and children, who, if they do not accompany him to the Poorhouse, have to undergo the pinch of poverty, and, exposed as they have been to the direct infection of Consumption, are very liable to suffer from the disease. If, on the other hand, should the family follow the father to the Poorhouse, it must be remembered the wife and children are at once separated from each other, and the very thought of this acts injuriously on the patient.

These remarks refer to confirmed cases of the disease, with regard to which it has been often urged in medical circles that it would be of great advantage, so far as the spread of Consumption is concerned, if 100 beds were available in the City for their reception. These, imperfectly nursed in their ill-ventilated and too often overcrowded homes (for consumptives, unfortunately, have large families), are constant sources of danger to the community.

While I have shown the various agencies that may be put in operation by the Corporation to meet the present demand on the part of the community and the Medical profession to lessen the risks of Phthisis in our midst, I have hesitated to insist on Notification. The only advantage that might be claimed in its favour—were it adopted, say, for a limited period—is that it would give the Corporation more exact information as to the extent of the scourge and the actual number who are affected. The tabular results of such an inquiry would also enable the Corporation to carry out the precautionary measures more thoroughly which have already been alluded to. I cannot, however, conceal the fact that, should Notification be determined upon, it will prove to be expensive. For, not only will the Medical profession have to be paid for intimation, but, as there must be some guarantee as to the nature of the cases, each Notification must be accompanied by a certificate that the case has shown the presence of the bacillus of Consumption.

To enable the Medical profession to furnish such evidence, the Corporation would require to subsidise the Bacteriological Laboratory of the Royal College of Physicians, so that every Medical practitioner in the City may, free of cost, obtain such a Bacteriological Certificate as will justify the Corporation in granting the usual fee of 2s. 6d.

The number of Phthisical patients in Edinburgh cannot be estimated at less than 5000, and this entails an expense for Notification of nearly £700, and with a subsidy of £200 to the College of Physicians, together with contingencies, the total sum will amount to £1000.

This question of Notification is one for the Health Committee, in the first instance, to decide; or whether the Corporation should go on as they have been doing, improving the sanitary condition of the City, paying greater attention to cleansing—especially in the poorer districts—doing their best to put down the inordinate habit of expectoration; and, lastly, by means of leaflets, giving such information to the citizens as should educate them in the hygienic treatment of this disease.

In conclusion, I need hardly remind the Corporation of the importance attaching, so far as Consumption is concerned, to the regulation of our Slaughter-house, and to the inspection of our Dairies and Milk supply. Edinburgh, with regard to these important points, has always stood in the van of great communities, and I trust that nothing will be done to impair, in any way, the stringency of the measures adopted by the Corporation in all these departments. There can be little doubt that in a few years science will provide infallible tests whereby tuberculosis will be at once detected. Meanwhile, until Government provides (1) tuberculin or other test of standard purity and in sufficient quantity, (2) extends its compulsory use over the whole kingdom, and (3) introduces and passes a Bill providing for satisfactory compensation, I cannot advise the general use of this means of diagnosis in our City byres.

HENRY D. LITTLEJOHN, M.D.,
Medical Officer of Health.

APPENDIX A.

A LIST OF DEATHS FROM PHTHISIS occurring in the Various Wards of the City during the year 1899.

CALTON WARD – No 1.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
7 Lady Menzies Place	14	0	0	M.	28	Glass Embosser
17 Albert Street	9	15	0	F.	34	Wife of Police Constable
5 Taylor Place	7	10	0	M.	1 11/12	Son of Sailmaker
5 East Thomas Street	7	16	0	M.	27	Tramcar Conductor
1 Taylor Place	12	0	0	M.	31	Spirit Dealer's Assistant
17 Windsor Street	70	0	0	F.	58	Widow of Spirit Merchant
81 Montgomery Street	18	0	0	F.	29	Daughter of Master Tailor
26 Carlyle Place	17	0	0	M.	24	Brassfinisher
21 Rossie Place	12	0	0	M.	26	Mercantile Clerk
32 Bothwell Street	11	0	0	F.	30	Wife of Postman
95 Albert Street	8	10	0	F.	6	Daughter of Lorryman
19 Spring Gardens	56	0	0	M.	23	Printer Compositor
22 Albert Street	11	10	0	F.	55	Widow of Tramcar Driver
61 Brunswick Street	18	10	0	F.	30	Wife of Commission Agent
11 Bothwell Street	13	0	0	M.	65	Engine Keeper
53 Albert Street	9	15	0	M.	19	Stationer's Warehouseman
1 Easter Road	19	4	0	M.	24	Law Clerk
23 Buchanan Street		...		F.	26	Wife of Joiner
5 East Thomas Street	7	16	0	F.	1 5/12	Daughter of Tailor
74 Montgomery Street	19	9	0	M.	16	Son of Mason
8 Lyne Street	9	3	0	M.	19	Apprentice Tinsmith
12 Willowbrae Road	15	0	0	F.	26	Widow of Spirit Dealer
1 Wilfrid Terrace	28	0	0	M.	1 4/12	Son of Customs Officer
12 Buchanan Street	11	0	0	F.	17	Daughter of Master Joiner
10 Tait Street	20	0	0	M.	19	Mercantile Clerk
15 Rossie Place	5	9	0	M.	21	General Labourer
9 Dalgetty Avenue	15	0	0	M.	15	Apprentice Clerk
2 Rossie Place	19	0	0	M.	19	Butcher's Assistant
47 Brunswick Road	26	0	0	M.	73	Mercantile Clerk
16 Bothwell Street	22	0	0	M.	30	Tramcar Driver
7 Hillend Place	8	3	0	F.	29	Wife of Railway Painter's Labourer
11 Rossie Place	12	0	0	F.	30	Domestic Servant
54 Easter Road	24	0	0	M.	26	Tailor
17 Hillside Street	21	9	0	F.	21	Daughter of Stableman
83 Brunswick Street	25	0	0	F.	29	Wife of Law Clerk
1 West Norton Place	16	0	0	F.	15	Daughter of Glassmaker
66 Albert Street	9	15	0	M.	44	Tramcar Driver
3 East William Street	8	5	0	M.	35	Grocer (pauper)
9 Elliot Street	8	10	0	M.	39	Baker
13 Parson's Green Terrace	14	0	0	M.	54	Railway Signalman
4 Lyne Street	9	15	0	M.	66	Mason
4 Dalgetty Road	11	0	0	M.	31	Railway Guard
15 Calton Hill	12	0	0	M.	19	Wood Machineman
26 Montrose Terrace	50	0	0	M.	57	Paper Ruler
10 South Drum Place	17	0	0	F.	25	Daughter of Coal Merchant
24 Hillside Street	28	0	0	F.	19	Dressmaker

SUMMARY.

Ages.		*Rentals.*	
Under 15 years	4	Under £10	13
15 and under 25 years	15	£10 and under £15	11
25 „ 45 „	20	£15 „ £20	10
45 and upwards	7	£20 and upwards	11
		Unknown	1
	46		46

Males, 28; Females, 18.

BROUGHTON WARD—No. II.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
6 Bellevue Street . .	24	0	0	M.	24	Law Clerk
19 Gayfield Square .	19	0	0	M.	42	Son of a Parochial Teacher
2 Middlefield . .	14	0	0	M.	45	Cab Driver
16 Beaverhall Terrace .	9	15	0	M.	34	Stonemason
59 Broughton Street .	18	0	0	M.	26	Golf Club Maker
13 Bellevue Place . .	38	0	0	F.	47	Wife of Joiner
43 James Street . .	15	0	0	F.	28	Domestic Servant
113 Broughton Street .	18	0	0	M.	22	Bank Clerk
6 Shaw Square . .	15	15	0	M.	$1\frac{3}{12}$	Son of Tailor
13 Spey Street . .	5	6	0	M.	43	Marble Cutter
19 Union Street . .	7	8	0	M.	24	Stableman
16 Dryden Street . .	13	0	0	F.	52	Wife of Metal Refiner
4 Bowhill Terrace . .	14	10	0	M.	17	Mercantile Clerk
1 Middlefield . .	2	12	0	M.	26	Newsagent
10 Dryden Street . .	12	0	0	M.	24	Journalist
27 Beaverhall Terrace .	9	4	0	F.	3	Daughter of Baker
1 Bonnington Terrace .	50	0	0	M.	24	Marine Engineer
6 Annandale Street .	28	0	0	M.	60	Army Pensioner
24 Gayfield Square .	9	0	0	M.	27	Bookbinder
5 Eyre Crescent, . .	30	0	0	F.	32	Wife of Master Tailor
16 Beaverhall Terrace .	9	15	0	M.	31	Printer Compositor
20 Haddington Place .	28	0	0	F.	31	Daughter of Marine Engineer
9 Broughton Street .	35	0	0	M.	30	Coachman
12 Dryden Street . .	14	0	0	M.	64	Army Pensioner
6 Albert Place . .	17	0	0	M.	49	Baker
26 Beaverhall Terrace .	16	0	0	F.	16	Daughter of Plumber
4 Canonmills . .	8	10	0	M.	3	Son of Drysalter's Warehouseman
6 Gayfield Street . .	16	18	0	M.	42	M.B., C.M.
16 Beaverhall Terrace .	9	15	0	F.	33	Wife of Spirit Dealer's Assistant
3 Rosebank Terrace .	20	0	0	M.	29	Cabinetmaker
9 Shrub Place . .	6	6	0	F.	19	Factory Worker
18 Beaverbank Place .	8	15	0	F.	73	Widow of Mason
11 Brandon Street. .	26	0	0	F.	29	Daughter of Engine Driver

Summary.

Ages.		*Rentals.*	
Under 15 years . .	3	Under £10 . .	11
15 and under 25 years .	9	£10 and under £15 .	5
24 „ 45 „ .	14	£15 „ £20 .	8
45 and upwards . .	7	£20 and upwards .	9
	33		33

Males, 22 ; Females, 11

ST BERNARD'S WARD—No. III.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
36 Dean Street . .	4	16	0	M.	26	House Painter
23 Reid Terrace . .	14	0	0	F.	30	Daughter of Mercantile Clerk
13 Dean Park Street .	13	0	0	M.	27	Upholsterer
37 Inverleith Row .	85	0	0	F.	43	Fundholder
17 Perth Street . .	19	9	0	M.	48	Printer's Reader
4 Bedford Street . .	7	6	0	M.	43	Mason
Craigleith Poorhouse .		...		M.	51	Army Pensioner (pauper)
Do. .		...		F.	4	Daughter of House Painter (pauper)
Do. .		...		M.	61	House Painter (pauper)
Do. .		...		M.	56	Army Pensioner, Mattress Maker (pauper)
Do. .		...		F.	43	Widow of Butcher (pauper)
Do. .		...		M.	1	Son of Labourer (pauper)
Do. .		...		F.	40	Laundress (pauper)
Do. .		...		M.	47	Shoemaker (pauper)
7 Leslie Place . .	19	0	0	M.	23	Printer Machineman
Grove Cottages, Water of Leith . . .	7	16	0	F.	18	Domestic Servant
4 Airlie Place . .	12	0	0	M.	53	Coach Painter
3 Bedford Street . .	7	10	0	M.	35	Labourer
13 Do. . .	7	6	0	M.	12	Son of Cab Driver
19 Hugh Miller Place .	15	0	0	M.	34	Fishmonger
9 Well Court . .	10	10	0	M.	39	Mason
76 Comely Bank Avenue	22	0	0	M.	46	Law Clerk
15 Allan Street . .	5	16	0	M.	38	Shop Porter (pauper)
14 Dean Path . .	6	16	0	M.	27	Brewery Cellarman
17 Perth Street	13	0	0	F.	36	Wife of Boot Cutter
18 Inverleith Gardens	46	0	0	M.	48	Commercial Traveller
3 Dean Path	4	18	0	M.	46	Flour Miller
102 Raeburn Place .	24	8	0	F.	14	Daughter of Inland Revenue Officer
23 Deanpark Street .	11	9	0	M.	39	Butler
4 Bedford Street . .	7	6	0	F.	15	Apprentice Bookbinder
19 Deanpark Street .	14	0	0	F.	$\frac{12}{12}$	Daughter of Boot Top Cutter
4 Glenogle Place . .	15	0	0	F.	37	Wife of Baker

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	5	Under £10 . .	9
15 and under 25 years .	3	£10 and under £15 .	7
25 „ 45 „ .	15	£15 „ £20 .	4
45 and upwards „ .	9	£20 and upwards .	4
		Unknown . . .	8
	32		32

Males, 21; Females, 11.

ST GEORGE'S WARD—No. IV.

Residence.	Rental. £ s. d.	Sex.	Age.	Occupation.
22 Caledonian Crescent .	9 15 0	F.	24	Daughter of Mercantile Clerk
13 Wardlaw Place .	9 15 0	M.	3	Son of Draper
67 Gorgie Road . .	8 11 0	M.	53	Mason
40 Caledonian Crescent .	10 9 0	M.	36	Sawmaker
62 Gorgie Road . .	11 0 0	M.	17	Vandriver
Saughton Leather Works	8 0 0	M.	31	Tanner
7 Gorgie Cottages . .	6 16 0	F.	24	Laundress
19 Stewart Terrace .	11 5 0	F.	34	Wife of Grocer
4 Downfield Place . .	16 0 0	F.	36	Widow of Battery Man (G.P.O.)
9 Stewart Terrace . .	9 15 0	M.	43	Blacksmith
19 Henderson Terrace .	19 0 0	F.	46	Wife of Builder
17 Do.	26 0 0	M	26	Son of Rubber Work Superintendent
4 Gorgie Cottages . .	7 16 0	M.	17	Glue Work Labourer
4 Downfield Place . .	17 0 0	F.	39	Wife of Tailor
11 Orwell Terrace . .	15 0 0	M.	53	Cabinetmaker
11 Downfield Place .	9 15 0	M.	14	Son of Coal Merchant
7 Robertson Avenue .	12 9 0	F.	35	Wife of Bricklayer
4 Appin Terrace . .	14 0 0	M.	19	Engineer's Patternmaker
19 Wardlaw Place .	9 10 0	M.	47	Mason
15 Grove Street . .	18 0 0	M.	48	Gymnastic Instructor, Army Pensioner
10 Smithfield Street .	12 0 0	F.	11	Daughter of Plumber
37 Caledonian Crescent .	12 0 0	M.	20	Gardener
6 Tynecastle Place .	8 15 0	F.	32	Wife of Railway Waggon Inspector
12 Sutherland Street .	8 15 0	F.	62	Widow of Commercial Traveller
1 Murieston Crescent .	17 0 0	M.	37	Mason
8 White Park . .	10 9 0	M.	59	Bricklayer
8 Orwell Place . .	10 9 0	F.	27	Milliner
9 Stewart Terrace . .	9 15 0	F.	30	Domestic Servant
41 Caledonian Crescent .	10 9 0	F.	60	Wife of Coal Banksman
137 Gorgie Road . .	7 6 0	F.	48	Widow of House Painter's Labourer
7 Wheatfield Road .	11 0 0	M.	4	Son of Biscuit Baker
15 Grove Street . .	16 10 0	M.	41	Upholsterer
4 Newton Street . .	12 0 0	F.	33	Wife of Tinsmith
3 Washington Street .	5 16 0	F.	1	Daughter of Joiner
179 Dalry Road . .	18 0 0	F.	20	Dressmaker
5 Newton Street . .	8 4 0	M.	39	Rubber Worker
7 Wardlaw Place . .	9 15 0	F	38	Wife of Coach Painter
314 Gorgie Road . .	13 9 0	M.	43	Ship Carpenter

Summary.

Ages.		*Rentals.*	
Under 15 years . .	5	Under £10 . . .	16
15 and under 25 years .	7	£10 and under £15 . .	13
25 „ 45 „ .	17	£15 „ £20 . .	8
45 and upwards . .	9	£20 and upwards . .	1
	38		38

Males, 20 ; Females, 18.

ST STEPHEN'S WARD—No. V.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
21 Jamaica Street . .	14	0	0	M.	32	Tramcar Driver
73 St Stephen Street .	15	0	0	M.	48	General Labourer
50 Cumberland Street .	9	2	2	M.	32	Watchmaker
8 Do. .	19	10	0	F.	44	Wife of Law Clerk
15 Royal Crescent . .	18	0	0	F.	26	Dressmaker
34 St Stephen Street .	3	16	0	F.	45	Wife of Insurance Agent
46 Great King Street .	32	0	0	F.	5½	Daughter of Portmanteau Maker
7 Cornwallis Place . .	18	0	0	M.	28	Commercial Traveller
71 Cumberland Street .	12	9	0	F.	39	Wife of Printer Compositor
5 Nelson Street . .	30	0	0	M.	62	Inspector (G.P.O.)
5 Howe Street . .	28	0	0	F.	62	Fundholder
11 Rodney Street . .	10	0	0	F.	19	Hosiery Knitter
70 Pitt Street . .	25	0	0	M.	14	Son of Grocer
11 Scotland Street . .	18	10	0	M.	61	Printer Compositor
5 Howe Street . .	25	0	0	F.	28	Wife of Marine Stoker
9 Jamaica Street . .	5	16	0	F.	45	Wife of Lithographic Printer
9 Cumberland Street .	9	14	0	M.	34	Mason
14 Pitt Street . .	38	0	0	M.	30	Solicitor
60 St Stephen Street .	7	16	0	M.	18	Son of Skinner
36A Dundas Street .	8	15	0	M.	57	Cabinetmaker
9 St Stephen Street .	9	9	0	F.	27	Wife of General Dealer
24 Dundas Street . .	11	0	0	M.	21	Cycle Salesman

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	2	Under £10 . .	7
15 and under 25 years .	3	£10 and under £15 .	4
25 „ 45 „ .	10	£15 „ £20 .	5
45 and upwards . .	7	£20 and upwards .	6
	22		22

Males, 12; Females, 10.

ST LUKE'S WARD—No. VI.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
7 Saunders Street .	6	6	0	F.	31	Daughter of Blacksmith
5 St Bernard's Place .	6	6	0	F.	20	Daughter of Engine Keeper
161 Rose Street .	6	15	0	M.	29	Tailor
121 Do. .	6	16	0	M.	67	Hosiery Warehouseman
74 George Street .	10	0	0	F.	23	Stationer's Assistant
25 India Place .	8	15	0	F.	20	Daughter of Baker
60 Morrison Street .	16	0	0	M.	38	Van Driver
21 Torphichen Place .	12	5	0	F.	37	Wife of Clerk (Burgh Assessor's Office)
38 India Place	4	6	0	M.	42	Mason's Labourer
65 Torphichen Street .	17	10	0	M.	59	Heraldic Painter

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	0	Under £10 . .	6
15 and under 25 years .	3	£10 and under £15 .	2
25 „ 45 „ .	5	£15 „ £20 .	2
45 and upwards . .	2	£20 and upwards .	0
	10		10

Males, 5; Females, 5.

ST ANDREW'S WARD—No. VII.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
2A Greenside Place .	6	5	0	M.	34	Newsvendor
4 New Broughton . .	55	0	0	F.	16	Daughter of Hotel Waiter
4 Gilchrist Entry . .	4	18	0	M.	33	Shoemaker
49 Thistle Street . .	13	0	0	M.	2	Son of Hairdresser
36 Leith Street . .	6	16	0	F.	6	Daughter of Blacksmith
4 Greenside Court .	4	0	0	M.	55	General Labourer
12 Leith Street Terrace .	6	10	0	F.	8	Daughter of French Polisher
8 Queen's Place . .	4	9	0	M.	51	Shoemaker
126 Leith Street . .	5	16	0	M.	21	Mercantile Clerk
96 do. . .	5	16	0	M.	1	Son of Labourer
5 Leith Street Terrace .	20	0	0	M.	52	Tailor
12 Queen's Place . .	6	10	0	F.	36	Wife of Stable Manager
1 North St James Street	9	15	0	M.	33	Engine Fitter
15B St James Square .	7	10	0	M.	18	Type Setter
11 Leith Street Terrace .	6	11	0	M.	16	Club Maker
21 Greenside Row .	3	16	0	F.	58	Widow of Cowfeeder
37 London Street . .	13	0	0	F.	15	Daughter of Bookkeeper
18 York Place . .	135	0	0	F.	19	Daughter of Solicitor Supreme Courts
58 Broughton Street .	22	0	0	F.	31	Daughter of Master Mariner
37 West Register Street	15	0	0	F.	57	Wife of Bookbinder
18 Broughton Street .	13	0	0	M.	24	Lithographic Artist
23 South St James Street	7	6	0	M.	28	Commercial Traveller
1 North St James Street	13	0	0	M.	48	Tailor
31 London Street . .	26	0	0	F.	19	Daughter of Laundryman
9 Greenside Place . .	12	0	0	M.	20	General Labourer
11 Leith Street Terrace .	28	0	0	M.	35	Rubber Worker
5 St Andrew Square .	10	0	0	F.	24	Daughter of House Steward

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	4	Under £10 . . .	14
15 and under 25 years .	10	£10 and under £15 .	6
25 „ 45 „ .	7	£15 „ £20 .	1
45 and upwards . .	6	£20 and upwards . .	6
	27		27

Males, 16; Females, 11.

CANONGATE WARD—No. VIII.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
24 Arthur Street . .	8	15	0	F.	27	Wife of Paper Cutter
27 Prince Albert Buildings	12	0	0	M.	35	Brewery Cooper
60 Dumbiedykes Road .	10	10	0	F.	13	Daughter of Mason
Queensberry House .		—		F.	59	Domestic Servant
98 Abbeyhill . .	8	5	0	F.	16	Daughter of Mechanical Engineer
60 Calton Road . .	6	6	0	F.	21	Laundress
256 Canongate . .	4	10	0	M.	19	Mill Labourer
96 do. . .	8	5	0	M.	31	Boot Finisher
13 Prince Albert Buildings	10	10	0	F.	29	Daughter of Grocer
Queensberry House .		—		F.	44	Wife of Tailor's Cutter
126 Spring Gardens .	18	0	0	F.	41	Wife of Detective Officer
2 Wilson's Court, Canongate . . .	5	16	0	M.	38	Brewery Cooper
67 Canongate . .	7	1	0	F.	7	Daughter of Labourer

CANONGATE WARD—No. VIII.—*Continued.*

Residence.	Rental.	Sex.	Age.	Occupation.
	£ s. d.			
4 Big Jack's Close, Canongate	4 8 0	M.	53	Tailor
10 Dunbar's Close, Canongate	5 0 0	F.	10	Daughter of Joiner
Abbey Court House, Abbey Strand	10 0 0	F.	39	Wife of Holyrood Palace Warder
21 Canongate	19 0 0	F.	11	Daughter of Park Gate Keeper
2 Whitehorse Close, Canongate	5 0 0	M.	1	Son of Tinsmith
124 South Back Canongate	6 16 0	M.	32	Foundry Labourer
19 Milton Street	9 4 0	M.	28	Printer Compositor
114 Spring Gardens	16 0 0	M.	44	Tinsmith
6 Malloch's Close, Canongate	4 7 0	M.	25	Shoemaker
13 Arthur Street	14 0 0	M.	19	Mercantile Clerk
222 Canongate	5 6 0	M.	26	Mason
2 Salisbury Street	13 5 0	M.	16	Apprentice Cabinetmaker
9 Morocco Close, Canongate	7 6 0	M.	54	Tailor
271 Canongate	7 16 0	F.	37	Wife of Tailor
14 Salisbury Street	18 0 0	M.	49	Mercantile Cashier
3 West Arthur Place	7 6 0	M.	29	Gas Meter Prover
10 Middle Arthur Place	8 3 0	F.	30	Wife of Ironmoulder
2 Malloch's Close, Canongate	5 16 0	M.	45	Brewery Labourer
119 Canongate	7 0 0	M.	42	Mason's Labourer
35 Milton Street	11 19 0	M.	51	Boilermaker
197 Canongate	10 0 0	M.	21	Tailor
12 East Arthur Place	6 6 0	F.	13	Daughter of Sewing Machine Canvasser
218 Canongate	9 9 0	F.	22	Envelope Folder
Milton Street	10 0 0	M.	30	Timekeeper
2 Prospect Place	8 15 0	M.	23	Lithographer
124 South Back Canongate	4 16 0	M.	12	Son of Hammerman
24/8 Dumbiedykes Road	12 0 0	F.	27	Wife of Rubber Worker
115 Canongate	3 6 0	F.	54	Wife of Cooper
4 Morocco Close, Canongate	4 15 0	F.	36	Wife of Coal Porter
12 St Mary Street	17 9 0	F.	13	Daughter of Cab Inspector
35/7 Dumbiedykes Road	8 15 0	M.	16	Apprentice Tailor
3 Prospect Street	15 0 0	M.	32	Grocer
40 Calton Road	6 6 0	F.	17	Coffee Warehousewoman
1 Croft-an-Righ	5 16 0	F.	39	Wife of Slater's Labourer
6 Wilson's Court, Canongate	3 16 0	F.	36	Widow of Maltman
40 St Mary Street	8 15 0	F.	13	Daughter of Wood Turner
114 Canongate	5 0 0	M.	45	Brassfinisher (pauper)
120 Pleasance	11 9 0	M.	68	Mason
6 Pirrie's Close, Canongate	5 16 0	F.	43	Wife of Hawker
3 Lochend Close, Canongate	5 5 0	M.	32	Letterpress Printer
37 Arthur Street	14 9 0	M.	34	Butcher

SUMMARY.

Ages.		*Rentals.*	
Under 15 years	9	Under £10	34
15 and under 25 years	10	£10 and under £15	12
25 „ 45 „	26	£15 „ £20	6
45 and upwards	9	£20 and upwards	0
		Unknown	2
	52		54

Males, 29 ; Females, 25.

ST GILES WARD—No. IX.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
4A Niddry Street	8	0	0	F.	34	Seamstress
29 Castle Terrace		...		F.	26	Daughter of Linen Lapper
5 Castle Wynd	3	10	0	F.	19	Wife of Plumber
90 Grassmarket	7	0	0	M.	23	Labourer
37 Blair Street	5	10	0	M.	18	Shop Porter
21 Do.	4	16	0	M.	50	Street Porter
16 Church Buildings	5	16	0	M.	8	Son of Labourer
117 High Street	6	6	0	F.	30	Wife of Gas Meter Grinder
54B Grassmarket	7	16	0	F.	19	Dressmaker
377 High Street	8	10	0	F.	1	Daughter of Iron Driller
2 Blackfriars Street	4	15	0	F.	$1\frac{10}{12}$	Daughter of Slater
441 Lawnmarket	6	16	0	F.	35	Wife of Baker
Grassmarket		...		M.	52	Coal Carter (pauper)
31 Grindlay Street	17	0	0	M.	16	Son of Mason
81 High Street	6	1	0	M.	39	Slater
97 West Bow (Lodging-House)		...		M.	2	Son of Cutler
31 Pleasance		...		M.	42	Chimney Sweeper (pauper)
23 Dickson's Close, High Street	3	14	0	F.	39	Widow of Labourer
45 Blackfriars Street	5	3	0	F.	11	Daughter of Mason's Labourer
10 High Street	6	0	0	F.	18	Paper Bag Maker
277 Do.	7	16	0	M.	54	Shoemaker
17 Borthwick's Close, High Street	4	10	0	F.	1	Daughter of Hairdresser
12 Grassmarket (Lodging-House)		...		M.	$1\frac{3}{12}$	Son of Mason's Labourer
97 West Bow	5	16	0	M.	$1\frac{6}{12}$	Son of Typefounder
105 West Bow (Lodging-House)		...		F.	13	Daughter of Ironmoulder's Labourer
28 High Street	4	2	0	F.	2	Daughter of Mason
101 West Port	3	16	0	F.	43	Widow of Cab Driver
4 Niddry Street	4	0	0	F.	45	Wife of House Painter
1 King's Stables Road (Lodging-House)		...		M.	58	Army Pensioner (pauper)
6 King's Stables Road	6	6	0	F.	55	Wife of Carter
1 Hall's Court	6	18	0	F.	$1\frac{7}{12}$	Daughter of Mason's Labourer
19 Bristo Place	9	4	0	M.	41	Tailor
1 Fleshmarket Close	10	0	0	F.	19	Bookfolder
63 West Port	9	4	0	M.	51	Cab Driver
43 Blackfriars Street	6	11	0	F.	20	Paper Bag Maker
43 High Street	6	0	0	M.	64	Labourer
32 Fountainbridge	9	13	0	M.	13	Son of Army Pensioner
4 Niddry Street	5	0	0	M.		Son of General Labourer
489 Lawnmarket	7	16	0	F.	46	Boot Machinist
10 Old Fishmarket Close	5	0	0	F.	43	Widow of Printer Compositor
85 West Port	10	0	0	M.	34	Stableman
1 King's Stables Road (Lodging-House)		...		M.	61	Plasterer
259 Cowgate	11	0	0	F.	33	Wife of Cabman
104 High Street	4	11	0	M.	54	Mason
26 Blackfriars Street	6	18	0	M.	37	Bootmaker
149 Fountainbridge	9	0	0	M.	6	Son of Mechanical Engineer
142 High Street (Children's Shelter)		...		M.	$\frac{12}{12}$	Son of Mercantile Clerk
1 St Giles Street	25	0	0	M.	34	Son of Baker
332 Lawnmarket	6	6	0	F.	42	
9 Ashley Buildings, High Street	6	18	0	M.	19	Apprentice House Painter
14 Grassmarket	4	16	0	M.	44	Horse Dealer
99 Lothian Road	33	0	0	F.	32	Optician's Shopwoman
12 College Wynd	6	10	0	F.	16	Bookfolder
123 West Port		...		M.	65	Mason (pauper)
256 Cowgate	8	5	0	M.	52	General Labourer

ST GILES WARD—No. IX.—*Continued.*

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
100 Cowgate . .	10	0	0	F.	35	Wife of Cab Driver
97 West Bow (Lodging-House) . . .	...			F.	27	Laundress (pauper)
4 Niddry Street . .	4	0	0	F.	23	Wife of Hardware Hawker
4 Bank Street . .	13	0	0	M.	51	Church Officer
98 Grassmarket (Lodging-House) . .	...			M.	28	Labourer (pauper)

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	15	Under £10 . .	40
15 and under 25 years .	11	£10 and under £15 .	5
25 „ 45 „ .	20	£15 „ £20 .	1
45 and upwards . .	14	£20 and upwards .	2
		Unknown . .	12
	60		60

Males, 31 ; Females, 29.

ST CUTHBERT'S WARD—No. X.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
23 Upper Grove Place .	14	0	0	M.	43	Confectioner
5 Do. .	13	0	0	F.	56	Widow of Mason
4 M'Neil Street . .	9	15	0	M.	21	Joiner
66 Dundee Street . .	9	15	0	M.	55	Mason
31 Watson Crescent .	12	5	0	F.	38	Widow of Joiner
31 Bruntsfield Avenue .	23	0	0	M.	27	Labourer
38 Comiston Drive .	45	0	0	F.	29	Domestic Servant
24 Polwarth Gardens .	29	0	0	M.	31	Barman
9 Fowler Terrace . .	12	0	0	M.	41	Joiner
101 Grove Street . .	12	9	0	M.	39	Hotel Waiter
15 Yeaman Place . .	12	9	0	M.	24	Hairdresser
37 Rosemount Buildings, Morrison Street .	9	13	0	M.	47	Wood Sawyer
4 Brandfield Street .	9	10	0	M.	53	Mason
177 Fountainbridge .	11	9	0	M.	22	Tailor
131 Grove Street . .	11	5	0	M.	17	Hairdresser
5 Upper Gilmore Terrace	20	10	0	M.	31	Advertising Clerk
43 Morrison Street .	17	0	0	F.	27	Laundress
6 St Peter's Place . .	26	0	0	M.	28	Law Clerk
30 Montpelier Park .	28	0	0	M.	41	Engrossing Clerk
4 Brandfield Street .	9	10	0	M.	49	Watchmaker
55 Rosemount Buildings, Morrison Street .	12	0	0	F.	47	Domestic Servant
1 Balcarres Street . .	17	0	0	F.	38	Wife of Musician
Royal Asylum, Morningside	...			F.	25	Daughter of Grocer
18 Lochrin Place . .	10	0	0	F.	29	Wife of Joiner
19 Bruntsfield Avenue .	26	0	0	M.	32	University Tutor
43 Morrison Street .	5	6	0	F.	27	Wife of Grocer
17 Miller Crescent .	24	0	0	M.	32	Butcher
85 Grove Street . .	15	0	0	F.	55	Wife of Lorryman
25 Craiglea Drive . .	45	0	0	F.	31	Wife of Teacher
9 Gardner's Crescent .	18	10	0	M.	38	Upholsterer
80 Leamington Terrace .	26	0	0	M.	29	Seaman
18 Thornybank . .	7	6	0	M.	4	Son of Cab Driver
4 Semple Street . .	8	0	0	F.	15	Daughter of Van Driver
86 Craiglea Drive . .	55	0	0	F.	31	Daughter of Secretary
32 Balcarres Street .	10	1	0	M.	31	Plumber
11 Tay Street . .	9	0	0	M.	22	Vulcanite Worker
Royal Asylum, Morningside	...			M.	47	Gilder

ST CUTHBERT'S WARD—No. X.—*Continued.*

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
9 Semple Street	5	0	0	M.	29	Rubber Worker
7 Gillespie Place	24	0	0	F.	7	Daughter of Mercantile Clerk
332 Morningside Road	19	0	0	F.	22	Dressmaker
70 Polwarth Terrace	...			F.	40	Wife of Cashier
88 Leamington Terrace	23	0	0	M.	25	Dairyman
37 Dundee Terrace	16	9	0	M.	13	Son of Clerk, City Road Trust
76 Polwarth Gardens	32	0	0	F.	28	Daughter of Merchant
39 Mardale Crescent	32	0	0	F.	50	Daughter of U.P.Ch. Minister
36 Grove Street	15	0	0	M.	20	Rubber Worker
56 Merchiston Avenue	22	0	0	F.	31	Wife of Butcher
129 Gilmore Place	24	0	0	M.	57	Bellhanger
Royal Asylum, Morningside	10	0	0	M.	38	Son of Editor
3 Elm Cottages, Gibson Terrace	6	0	0	M.	1	Son of Domestic Servant
45 Balcarres Street	12	9	0	M.	27	Register House Clerk
14 Gardner's Crescent	26	0	0	F.	41	Wife of French Polisher
32 Grove Street	17	9	0	M.	27	Upholsterer
21 Yeaman Place	11	15	0	F.	18	Domestic Servant
18 Thornybauk	7	6	0	F.	54	Do.
52 Morningside Road	30	0	0	F.	60	Widow of Engineer
2 Hazelbank Terrace	19	9	0	M.	18	Apprentice Ironmonger
12 St Peter's Place	22	0	0	F.	20	Son of Brassfinisher
16 Bruntsfield Avenue	21	0	0	F.	52	Ladies' Outfitter
19 Briarbank Terrace	26	0	0	F.	39	Medical Nurse
14 Murdoch Terrace	8	15	0	M.	24	Stationery Packer
35 Ashley Terrace	19	9	0	M.	23	Army Pensioner
47 Viewforth	23	0	0	F.	37	Wife of Clerk (G.P.O.)
9 Dorset Place	42	0	0	M.	28	Dairyman
4 Upper Gilmore Place	19	10	0	F.	34	Daughter of China Merchant
Home—Little Sisters of the Poor	...			M.	66	Labourer
2 Hazelbank Terrace	19	9	0	M.	18	Apprentice Ironmonger
47 Viewforth	23	0	0	F.	37	Wife of Clerk (G.P.O.)

Summary.

Ages.		*Rentals.*	
Under 15 years	4	Under £10	13
15 and under 25 years	14	£10 and under £15	14
25 „ 45 „	36	£15 „ £20	12
45 and upwards	14	£20 and upwards	25
		Unknown	4
	68		68

Males, 39; Females, 29.

GEORGE SQUARE WARD—No. XI.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
2 Montague Street	19	0	0	M.	41	Police Constable
35 Buccleuch Place	15	0	0	F.	18	Printer Compositor
19 Brougham Street	28	0	0	M.	33	Railway Clerk
19 Marshall Street	9	0	0	M.	28	Tailor
32 West Port (Lodging-House)		...		M.	61	Cab Driver
34 Buccleuch Place	34	0	0	M.	58	Bookbinder
3 Glengyle Terrace	55	0	0	M.	43	Doctor of Medicine
184 Lauriston Place	12	0	0	F.	45	Widow of House Painter
2 Simpson's Court, Potterrow	6	0	0	F.	14	Daughter of Mech. Engineer
105 Buccleuch Street	14	10	0	M.	44	Mason
28 West Nicolson Street	9	5	0	M.	29	Mercantile Clerk
1 Forrest Hill	8	10	0	F.	42	Bookfolder
14 Brougham Place	22	0	0	M.	29	Draper's Assistant
3 Montague Street	4	0	0	M.	24	Farm Servant
21 Brougham Place	16	0	0	F.	34	Wife of Portmanteau Maker
143 Lauriston Place	7	16	0	M.	5	Son of Ironmoulder
9 Cowgatehead (Lodging-House)		...		M.	31	Butcher
30 St Patrick Square	8	3	0	M.	22	Cooper
70 West Port	6	9	0	M.	50	Marble Cutter
5 Vennel (Salvation Army Rescue Home)		...		F.	31	Domestic Servant
1 Lauriston Terrace	19	0	0	M.	21	Spirit Dealer's Assistant
121 Lauriston Place	9	15	0	M.	19	Clothier's Apprentice
39 West Nicolson Street	19	0	0	M.	28	Architect's Draughtsman
27 Rankeillor Street	28	0	0	M.	32	Printer Compositor
69 Lauriston Street	8	15	0	M.	38	Mason
27 Home Street	7	6	0	F.	56	Wife of Engine Fitter
112 Potterrow	5	1	0	M.	53	Typefounder
47 Do.	12	9	0	M.	44	Spirit Salesman
75 Grassmarket (Lodging-House)		...		M.	27	Lodging-House Warder
3 Lonsdale Terrace	42	0	0	F.	46	Fundholder
22 Gifford Park	35	0	0	M.	70	Upholsterer
14 West Port	4	15	0	F.	26	Wife of Mason's Labourer
25 Grassmarket	10	9	0	M.	37	Coal Merchant
75 Do. (Lodging-House)		...		M.	33	Dock Labourer (pauper)
108 Potterrow	7	0	0	M.	36	Joiner
117 Nicolson Street	7	10	0	F.	51	Laundress
47 St Patrick Square	17	0	0	F.	28	Domestic Servant
40 Bristo Place	10	0	0	M.	44	Mason
27 Buccleuch Street	11	15	0	M.	1½	Son of House Painter
75 Grassmarket (Lodging-House)		...		M.	40	Labourer
15 Brougham Street	20	0	0	M.	68	Joiner
8 Tarvit Street	16	0	0	M.	20	Glazier
51 Lauriston Street	7	16	0	F.	21	Laundress
7 Gifford Park	9	4	0	M	51	Printer's Warehouseman
16 Marshall Street	15	0	0	F	19	Clerkess
27 Home Street	12	0	0	M	5	Son of Plumber
3 Hope Park Crescent	27	0	0	M	9	Son of Joiner
51 High Riggs	5	6	0	M.	7	Son of House Painter
78 West Port	7	6	0	F	32	Wife of Mason's Labourer
60 High Riggs	9	0	0	M.	35	Lorryman
35 Lutton Place	11	0	0	F.	47	Wife of Commercial Traveller
118 West Port	7	6	0	F.	41	Wife of Tanner
47 Potterrow	12	9	0	M.	20	Biscuit Baker
9 Buccleuch Street	14	0	0	F.	48	Wife of Engine Keeper
5 Valleyfield Street	19	0	0	M.	30	Hairdresser
7 Gifford Park	4	6	0	M.	37	Lamplighter
16 Buccleuch Place	55	0	0	M.	60	Surgeon (retired)

GEORGE SQUARE WARD—No. XI.—*Continued.*

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
26 Lothian Street . .	8	0	0	F.	23	Saleswoman
3 Crichton Street . .	15	0	0	M.	78	Blacksmith
23 Buccleuch Street .	5	11	0	M.	55	Tailor
120 Do. . .	17	0	0	F.	18	Daughter of Gilder
96 Potterrow . .	8	5	0	M.	40	Tailor
78 Do. . . .	11	0	0	M.	20	House Painter
105 Buccleuch Street .	16	0	0	F.	19	Daughter of Ironmonger
15 Tarvit Street . .	15	0	0	M.	77	Mason
96 Potterrow . .	8	15	0	F.	43	Widow of Tailor
75 Grassmarket (Lodging-House) . . .		...		M.	22	Labourer (pauper)
5 Tarvit Street . .	22	0	0	M.	49	Mason
11A Montague Street .	12	0	0	M.	23	Brickbuilder
75 Grassmarket . .	11	0	0	M.	59	Labourer (pauper)
95 Lauriston Place .	15	0	0	M.	19	Joiner
84 West Port . .	5	10	0	M.	60	Quarry Labourer
50 Bristo Street . .	12	10	0	M.	53	Spirit Dealer's Assistant

SUMMARY.

Ages.		*Rentals.*	
Under 15 years . .	6	Under £10 . .	27
15 and under 25 years .	16	£10 and under £15 .	14
25 „ 45 „ .	30	£15 „ £20 .	14
45 and upwards . .	21	£20 and upwards .	11
		Unknown . .	7
	73		73

Males, 52; Females, 21.

ST LEONARD'S WARD—No. XII.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
55 St Leonard's Hill	...			M.	36	Mason (pauper)
10 Forbes Street	9	4	0	F.	44	Wife of Stereotyper
23 West Richmond Street	6	6	0	M.	34	House Painter
7 Hill Place	5	16	0	F.	1	Daughter of Labourer
150 Dumbiedykes Road	8	1	0	F.	27	Wife of Tinsmith
49 Richmond Street	9	10	0	M.	23	Mercantile Clerk
3 Gilmour Street	5	1	0	M.	29	Typefounder
27 St Leonard's Street	18	0	0	F.	34	Tailoress
8 Roxburgh Street	19	0	0	F.	22	Daughter of Brewer
6 Beaumont Place	9	15	0	M.	52	Printer Compositor
13 Hill Place	8	15	0	F.	27	Domestic Servant
41 Carnegie Street	7	1	0	M.	66	Baker
35 Carnegie Street	6	11	0	F.	10	Daughter of Soldier
6 Drummond Street	7	6	0	F.	32	Wife of Brassfinisher
193 Pleasance	9	5	0	M.	39	Mason's Labourer
50 St Leonard's Street	11	10	0	M.	20	Labourer
2 Henry Place	8	5	0	F.	21	Daughter of Joiner
41 Carnegie Street	6	16	0	F.	14	Daughter of Printer
3 Forbes Street	9	15	0	M.	41	Spirit Salesman
121 Dumbiedykes Road	9	0	0	F.	25	Compositoress
33 East Crosscauseway	7	6	0	M.	35	Tailor
7 Hill Place	6	0	0	M.	42	Labourer
13 South Richmond Street	5	6	0	M.	35	Iron Planer
21 East Crosscauseway	6	9	0	M.	33	Advertising Agent
127 Dalkeith Road	26	0	0	M.	53	Commercial Clerk
5 Brown Street	6	0	0	M.	50	Spirit Salesman
21 St Leonard's Hill	10	0	0	M.	27	Iron Turner
95 Dumbiedykes Road	12	15	0	F.	32	Wife of Mason
26 South Richmond Street	7	6	0	F.	43	Widow of Maltman
146 Pleasance	10	8	0	F.	15	Daughter of Police Constable
14 Kilmaurs Road	42	0	0	M.	38	Clerk, Register House
22 Drummond Street	9	15	0	F.	1	Daughter of Shoemaker
12 Roxburgh Street	10	0	0	M.	40	House Painter (pauper)
21 Carnegie Street	5	16	0	F.	18	Waiteress
19 South Richmond Street	5	1	0	F.	23	Lacquerer
10 North Richmond Street	12	5	0	F.	38	Laundress
34 St Leonard's Street	14	9	0	M.	59	Blacksmith
Cameron Bank, Dalkeith Road	35	0	0	M.	21	Diamond Setter
4 Paul Street	4	10	0	F.	48	Wife of Typefounder
101 Pleasance	11	0	0	F.	41	Wife of Cooper
21 St Leonard's Hill	10	0	0	M.	22	Clerk
8 South Richmond Street	4	12	0	F.	23	Bookfolder
4 Dalrymple Place	8	15	0	M.	43	Brassfinisher
4 Heriot Mount	9	5	0	F.	34	Wife of Typefounder
51 East Crosscauseway	13	0	0	F.	35	Wife of Joiner
34 Clerk Street	19	0	0	F.	53	Widow of Joiner
54 West Richmond Street	8	15	0	M.	61	Engineer
23 Cowan's Close, East Crosscauseway	5	16	0	M.	31	Plumber
5 Parkside Street	13	0	0	F.	30	Dressmaker
10 North Richmond Street	6	16	0	F.	22	Typefounder

Summary.

Ages.		*Rentals.*	
Under 15 years	4	Under £10	32
15 and under 25 years	11	£10 and under £15	11
25 „ 45 „	27	£15 „ £20	3
45 and upwards	8	£20 and upwards	3
		Unknown	1
	50		50

Males, 24; Females, 26.

NEWINGTON WARD—No. XIII.

Residence.	Rental. £	s.	d.	Sex.	Age.	Occupation.
57 Newington Road .	40	0	0	M.	33	Tobacconist
Longmore Hospital .		...		M.	19	Shop Porter
7 Oxford Street . .	25	0	0	M.	52	Bank Clerk
Belleslea, Corrennie Gdns.	90	0	0	F.	44	Wife of Wholesale Confectioner
13 Suffolk Road . .	80	0	0	F.	19	Daughter of Wine Merchant
8 Gladstone Terrace .	18	0	0	F.	26	Machinist
4 Dalkeith Road . .	13	10	0	M.	20	Printer Compositor
198 Causewayside . .	8	4	0	F.	34	Widow of Bricklayer
13 Roseneath Terrace .	28	0	0	F.	56	Wife of Photographer
15 Braidburn Terrace .	48	0	0	M.	48	Stationer
Longmore Hospital .		...		F.	27	...
27 East Preston Street .	23	0	0	F.	4	Daughter of Commercial Traveller
Canaan House Stables, Grange Loan . .	10	0	0	M.	49	Shepherd
16 West Newington Place	16	0	0	F.	49	Widow of Printer Compositor
7 Hermitage Terrace .	50	0	0	M.	60	Wine Merchant
6 Mayfield Gardens .	115	0	0	M.	37	Tea Merchant
32 Thirlestane Road .	28	0	0	M.	56	Mason
16 Marchmont Crescent .	22	0	0	F.	12	Daughter of Gardener
9 West Newington Place	14	0	0	M.	20	Labourer
1 Steel's Place . .	15	0	0	M.	39	Commercial Traveller
24 Roseneath Place .	13	0	0	M.	47	Commercial Traveller
Longmore Hospital .		...		M.	24	Railway Servant
58 Marchmont Crescent .	28	0	0	F.	31	Daughter of Bootmaker
9 Moncrieff Terrace .	15	9	0	M.	34	Tailor
41 Marchmont Terrace .	24	10	0	M.	18	Clerk
Longmore Hospital .	13	0	0	F.	26	Domestic Servant
16 Glenorchy Terrace .	80	0	0	M.	28	Tailor and Clothier
4 Marchmont Street .	24	0	0	F.	71	Widow of Millworker
23 Causewayside . .	13	0	0	M.	40	Counterman, G.P.O.
9 Hermitage Gardens .	70	0	0	F.	38	Daughter of Builder
166 Causewayside . .	9	8	0	M.	25	Printer Machineman
Woodburn House, Canaan Lane . . .	160	0	0	M.	24	Army Officer, Lieutenant
Longmore Hospital .		...		F.	22	Domestic Servant
2 Moncrieff Terrace .	11	0	0	F.	26	Daughter of Joiner
8 Dryden Place . .	65	0	0	M.	36	Ironmonger
Longmore Hospital .		...		M.	26	Labourer
33 Marchmont Crescent .	26	0	0	F.	15	Daughter of Supervisor, Branch Post Office
63 South Clerk Street .	38	0	0	F.	42	Domestic Servant
9 Marchmont Street .	28	0	0	F.	20	Daughter of Chemist
55 Warrender Park Road	28	0	0	F.	35	Wife of Hardware Merchant
192 Causewayside . .	8	8	0	M.	42	Mason
11 Moncrieff Terrace .	14	0	0	M.	24	Watchmaker
89 Comiston Road .	27	0	0	M.	18	Mercantile Clerk
211 Morningside Road .	18	0	0	F.	47	Wife of Van Driver
17 Bruntsfield Gardens .	25	0	0	F.	52	Wife of Stationer
31 Sciennes Road . .	30	0	0	M.	34	Accountant
6 Grange Court . .	10	0	0	F.	58	Widow of House Painter
Longmore Hospital .		...		F.	47	Widow
14 Roseneath Place .	19	0	0	F.	50	Wife of Typefounder
Woodburn, Canaan Lane	160	0	0	M.	20	Draper
14 Roseneath Place .	19	0	0	M.	54	Typefounder

Summary.

Ages.		*Rentals.*	
Under 15 years . .	2	Under £10 . .	3
15 and under 25 years .	13	£10 and under £15 .	9
25 „ 45 „ .	21	£15 „ £20 .	7
45 and upwards . .	15	£20 and upwards .	26
		Unknown . .	6
	51		51

Males, 27 ; Females, 24.

PORTOBELLO WARDS—Nos. XIV., XV., XVI.

Residence.	Rental.	Sex.	Age.	Occupation.
	£ s. d.			
Ward XIV.—				
44 Tower Street .	15 0 0	M.	18	Railway Waggon Checker
Hume's Cottages, High Street . .	7 7 0	F.	22	Domestic Servant
25 Tower Street .	20 0 0	M.	64	Commission Agent
17 Pipe Street . .	5 0 0	M.	50	Mason's Labourer
Tower Bank Buildings, Ramsay Lane .	12 5 0	F.	29	Wife of Work's Stoker
Ward XV.—				
118 High Street .	6 0 0	F.	38	Ice Cream Dealer's Assistant
97 High Street . .	7 0 0	M.	20	Railway Engine Cleaner
2 Ramsay Place .	9 15 0	F.	7	Daughter of Insurance Inspector
2 Southfield Place .	16 0 0	M.	17	Apprentice Plumber
Ward XVI.—				
2 Osborne Terrace .	28 0 0	M.	44	Farmer (retired)

Summary.

Ages.		*Rentals.*	
Under 15 years . .	1	Under £10	5
15 and under 25 years .	4	£10 and under £15 . . .	1
25 „ 45 „ .	3	£15 „ £20 . . .	2
45 and upwards . .	2	£20 and upwards . . .	2
	10		10

Males, 6; Females, 4.

APPENDIX B.

TABLE showing DEATHS from PHTHISIS in different Age periods for the Year 1899.

	WARDS.																Total.	Death-rate per 1000 of the Population.
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	XVI.		
Under 15 years . .	4	3	5	5	2	—	4	9	15	4	6	4	2	—	1	—	64	·70
15 and under 25 .	15	9	3	7	3	3	10	10	11	14	16	11	13	2	2	—	129	2·02
25 „ 45 .	20	14	15	17	10	5	7	26	20	36	30	27	21	1	1	1	251	2·96
Over 45 years . .	7	7	9	9	7	2	6	9	14	14	21	8	15	2	—	—	130	2·19
Total . .	46	33	32	38	22	10	27	54	60	68	73	50	51	5	4	1	574	
														10				
Rate per 1000 of the Population .	1·76	2·53	1·89	1·26	1·63	·62	1·93	2·42	2·45	2·11	2·52	2·25	1·44	1·04			1·92	

II. CONFERENCE ON CONSUMPTION.

On Thursday, 9th February 1899, within the City Chambers, a Conference was held between the Sub-Committee of the Public Health Committee on the Prevention of Consumption, representing the Town Council, and Representatives of the Medical Faculty of the University of Edinburgh, the Royal Colleges of Physicians and Surgeons, the Edinburgh Veterinary College, and the New Veterinary College, Edinburgh.

Sederunt :—

Representatives of the Town Council.—Bailie Pollard, Judges Gulland and Sir Andrew M'Donald, Councillors W. Williams, W. Lang Todd, John Mallinson, W. S. Brown, J. H. Waterston, Robert Menzies, Alex. Forbes Mackay and Samuel Carmichael.

Representatives of the Medical Faculty of the University.—Sir Thomas Grainger Stewart, Professor of the Practice of Medicine and President of the British Medical Association; W. S. Greenfield, Professor of Pathology; and Charles Hunter Stewart, Professor of Public Health.

Representatives of the Royal College of Physicians.—Drs James Andrew, President; Sir John Batty Tuke, Claud Muirhead, John Wyllie, James Affleck, Andrew Smart, James Foulis, Byrom Bramwell, Alex. James, Thomas F. S. Caverhill, G. A. Gibson, R. W. Philip and D. Noel Paton, Fellows.

Representatives of the Royal College of Surgeons.—Professor John Chiene, President; Messrs Joseph Bell, John Duncan, Blair Cunyngham, Argyll Robertson, P. H. Maclaren, John Smith and J. Dunsmure, Fellows.

Representatives of the Veterinary Colleges.—Principal Williams, of the New Veterinary College; and Principal Dewar, of the Royal Dick College.

There were also present:—Sir Henry D. Littlejohn, Medical Officer of Health, and Professor of Medical Jurisprudence; Dr Claude B. Ker, Resident Physician at the City Hospital; Dr Maxwell Williamson, Chief Sanitary Inspector; and Dr George P. Boldie.

An apology for absence, owing to indisposition, was intimated from Sir William Turner, President of the General Medical Council and Professor of Anatomy in the University of Edinburgh.

Bailie James Pollard, Convener of the Public Health Committee, in the chair.

The Chairman said—Gentlemen, Representatives of the Medical Faculty of the University, Presidents and Fellows of the Royal Colleges of Physicians and Surgeons, and Principals of the two Veterinary Colleges, my first duty on the part of myself and of my colleagues is to thank you for the honour you have done us in responding to our invitation to give us the benefit of your counsel upon this most important question of how to deal with consumption. In thanking you, I am sure I am speaking—and my colleagues present will bear me out—not only on behalf of the Special Committee to whom the Town Council has remitted the consideration of this question, but also on behalf of the Lord Provost and the general body of the Town Council. The Lord Provost desires me to say how much he regrets being absent from the meeting to-day. He is engaged just now at very important tramway work, and I am sure that our good wishes go with him in his anxious labours in connection with that difficult undertaking. I ought to say that the remit under which this Committee is acting is in the following terms:—"That, having "regard to the opinions now maintained by leading medical men that consump-"tion is an infectious and preventable disease, it be remitted to the Public "Health Committee to consider whether any, and what, steps ought to be "taken by the Local Authority to protect the public against the disease in "Edinburgh, and to report." You will please note that the members of the

Committee have had before them a considerable body of information upon the subject, but they desire a great deal more. They are led to believe that physicians and surgeons of eminence throughout this and other countries are coming to a consensus of opinion upon the curability of the disease, upon the communicability of the disease, and upon its preventability. That is to say, it is all these,—curable, communicable, and preventable. If these things be so, the question that the Committee have to ask themselves is just the question into which His Royal Highness the Prince of Wales put the whole problem seven or eight years ago—If preventable, why not prevented? The first thing they did—and I am sure you will heartily commend them—was to obtain a report from Professor Sir Henry Littlejohn, our excellent Medical Officer of Health, by whom, as you know, the City is so admirably served. We have placed that report before you in order that you may have the same information that we ourselves possess so far as Edinburgh is concerned. I wish, on behalf of my colleagues, to express, in a few words, the main facts brought out in that report, which impress us very strongly. The first important fact that strikes us is with reference to the statement given upon page 4, where you have a table showing the prevalence of the disease in Edinburgh. That table gives us two decades—from 1878 to 1887 and from 1888 to 1897. We find, comparing the latter with the former decade, a diminution of one per thousand over the whole mortality. It is interesting to note that that diminution of mortality, or, in other words, that saving of life, has been obtained, four-tenths of it from zymotic disease, three-tenths from phthisis, and the other three-tenths from general disease. So that zymotic diseases are yielding, in a greater degree than phthisis, to improved sanitary measures and precautions. Still, phthisis is yielding, and we, as the Local Authority, recognise the importance of a fact like that, for it plainly demonstrates to us that, by improving the general sanitary conditions of the population, we are snatching victims from phthisis as well as from other forms of preventable disease. The report also shows, and it is a very noteworthy fact, that the mortality from phthisis exceeds the mortality from all the fevers put together: the number of victims from phthisis alone is 529 for the year 1898, while the number of victims from all the fevers is only 413. At the same time, the annual death-rate from phthisis in Edinburgh appears from this table to be only one in ten of the whole deaths, and that seems to show that Edinburgh, though it is not what we would like it to be, is not worse, but rather better off in this respect than other communities. I need not labour to prove that to medical men who are familiar with the general statistics of the disease we are dealing with. The mortality as shown in the table is composed of 296 males and 231 females, the male victims thus showing a preponderance of nearly one-fifth so far as our community is concerned. Further, it strikes us very strongly in connection with the total number, that out of the whole 529 only 25 were under ten years of age at the date of death. The average age of the whole is thirty-four. So that we may speak generally of all those as productive lives struck down in the prime of their power and usefulness. Moreover, at that average age they have long survived the milk food period, and I hope you may be so interested on this point as to advise us how far, in your view, milk may be said to be a factor in bringing about the infection of so large a number of adults. Of course we are only too familiar with the disastrous effects of bad milk in producing other forms of tuberculosis among children. Then, the conditions under which we find those victims are indicated in the report by means of the very excellent details you have in the appendix, which extends over some sixteen pages. We have the rents which are paid for each of the houses from which victims have been taken. If you look at these, you will find that the average accommodation is that which is represented by one, two, or three-roomed houses, because the great majority of the deaths have taken place in houses with a rent under £15, certainly under £20. The report thus suggests that the homes in which most of the patients dwell are inadequate for the proper treatment of sufferers from that disease. Very often when a bread-winner is laid down with it, an effort is made, because of failing resources, to increase the house supplies by the introduction of a lodger or even two lodgers. The question with us is, what about the risk of infection to other inmates? If you say that this is an infectious disease, and in the later stages highly infectious, what about the condition of the people who are waiting upon the patient, who have to occupy the same house, and perhaps even the same

bed? Does it, in your opinion, lie upon us, the Local Authority responsible for the general health of the City, to make provision for the separate treatment of those who are thus a danger to others? If so, of what kind and to what extent?

Such then, in brief, is the state of the facts. I put these considerations to you as those which are exercising our minds, and which form the reasons that have prompted us to ask your counsel at this time. I am not aware that any municipality in this country has formally sought such a conference as we have ventured to ask to-day, but we count ourselves happy above most other municipalities that we have at hand a medical school, which, in our judgment, stands higher than any other medical school in Her Majesty's dominions, and upon which we can safely rely for the wisest advice in this great cause. We are deeply indebted to you gentlemen, leaders of the medical profession in Edinburgh, and recognised all over the world for your eminence in medical and surgical science, that you are kind enough to come and give us the benefit of your learning and ripe experience.

It is necessary that we should make the most of our time. We also wish to make the most of what you may communicate to us, but I presume you won't desire to stay longer than 5.30, and that is a very short time in which to go over this very large subject. I have, however, before me the names of several gentlemen who will lead upon the different subjects which the Committee desire to mark out for special consideration, and these are: (1) The preventability of the disease; (2) its curability; (3) the question of sanatoria; (4) liability to the disease, with anything you may be good enough to say even upon the question of heredity; and (5) the question of the notification of the disease.

Dr JAMES ANDREW, President of the Royal College of Physicians, said—In the first place, I should like to thank you, Sir, as Convener of the Public Health Committee, as also your Committee, for this official recognition of the position which the Royal Colleges of Physicians and Surgeons hold as high medical authorities, by approaching them asking for light or guidance on this question of tuberculosis, a question which so deeply concerns the health of this City. I can assure you, Sir, that our College appreciates this recognition, and are or will be at all times ready to give what advice and assistance they can to the Municipal Authorities, in any matter affecting the health or sanitation of the City.

In your letter asking me to request a certain number of our Fellows to come here to-day to this Conference, you indicated that your Committee desiderated information on five points. As I was aware that the time at this meeting's disposal was limited, I thought it advisable to ask certain of our Fellows to introduce the five questions mentioned by you; and as a result, Sir Thomas Grainger Stewart has consented to speak as to the preventability of consumption, Dr Muirhead as to its curability, Dr Affleck on sanatoria, Professor Greenfield, as to the liability to the disease, and Dr Philip on notification, and there are other Fellows of our College present who are ready and willing to give you the benefit of their knowledge and experience. When I state that I have asked those gentlemen I have just named to come here to address you, I think you will agree that it would be inexpedient for me to enter further into the subject than briefly to indicate my own views on one or two points.

As regards preventability, we all recognise the immense work that has already been done towards this in this City, by strict supervision of our dairies, slaughter-houses, and insanitary areas, points already brought out in the valuable report just drawn up by our esteemed Medical Officer of Health. At the Conference recently held at Marlborough House, preventability was strongly insisted upon, and the question of heredity cast in the shade, if not entirely denied; for my part, I should say that undoubtedly there are many people, many families, who, though they may not be born tuberculous, have by inheritance a constitution which strongly predisposes to this disease.

With regard to sanatoria, with a view to a cure, we may say that they are still upon their trial; we hear of their successes, but we do not hear much of their failures and disappointments. A hospital for advanced cases I consider to be a great and clamant want, and such a hospital would soon be filled by patients from the Royal Infirmary waiting-rooms and the dispensaries, and this brings me to the question of notification, a very difficult question, if you prefer to put it on the same level as our present contagious diseases are, and seek

powers not only for compulsory notification, but also for compulsory removal. I hold that neither public nor medical opinion is yet ripe for such a step.

Professor Sir T. GRAINGER STEWART said—I am glad to have an opportunity of speaking to-day, on the part of the Faculty of Medicine of the University, and also of the Royal College of Physicians, for the subject which brings us together is one of profound importance, and one in which I am personally deeply interested. At the same time, it is not a very easy thing to stand up and discuss a question like that which we are to consider, in the presence of an audience so familiar with the subject. Among those who represent the Town Council at this meeting are some who are particularly well informed regarding tuberculosis. The communications which appeared in the *Scotsman* some time ago, and which have been attributed to your pen, Sir, I would put in the very front rank of what I have seen written on this matter for the instruction of the public. We all know how much Edinburgh is indebted to Sir Henry Littlejohn for his recent report, and for the very excellent work he has done for the City in this and kindred matters, and when I see around me other professional brethren who know at least as much upon the subject as I know myself, I find it is really somewhat embarrassing to take a part in opening the discussion.

I have been asked to speak specially regarding the preventability of consumption. I scarcely think that it is your wish that I should formally adduce evidence of the fact that it is possible to prevent the development of the disease. I fancy that doctors and Public Health Committees alike are pretty well satisfied on that point, and that even the general public is for the most part convinced. The first step towards preventing a disease is the discovery of its cause. A good many of us here remember the excitement and interest which we felt when we heard for the first time from M. Willemin that tubercle was inoculable, that it was possible, by taking bits of tuberculous tissue from the human subject and inoculating animals with them, to produce in the animals the same disease. That was in 1866 or 1867, and then in 1881-82 came the wonderful discovery of Koch with regard to the tubercle bacillus. We all know perfectly well that the one essential cause of the whole of the tuberculous processes is this bacillus. People have debated whether we have been right or wrong in our idea that the constitution has something to do with susceptibility. It seems to me that the constitution has a great deal to do with it. In some cases there is a hereditary tendency to the disease, and in many cases an acquired liability. It is just, so to speak, a matter of invaders and invasion. You have the invader, the bacillus, and you have the territory which he is seeking to invade, and a great deal depends on the vitality of the territory which he is attempting to take, whether he succeeds in effecting its conquest or not. We have much in our power with regard to dealing with and strengthening those who are, as we all are, exposed to the invasion of the tubercle bacilli. I believe in hereditary susceptibility, but I believe also in acquired susceptibility, the susceptibility of people who work in bad atmospheres, under unwholesome conditions, for too long hours, are ill-fed, or are otherwise unfavourably situated. I don't suppose there is anybody here who holds a different opinion from that. We may thus assume that the tubercle bacillus is the essential cause, but that constitutional susceptibility is also by no means unimportant. In our efforts at prevention we must advert to both.

Well, Sir, the question about which, I conceive, you would like us to speak is, what, in our judgment, so far as we can see into the matter, may be the lines in which you, as a Public Health Committee, can properly take action. Now, I should like very well to go over the whole of Sir Henry Littlejohn's report and the whole of the recommendations of the British Medical Association, but to do so would be impossible. I have jotted down a few points which I think are of special importance. Firstly, I would warmly recommend that you should carry out the principle of diffusing information in such a way as is suggested by Sir Henry Littlejohn. I think you should issue such sheets as these that lie before us, mounted on strong pasteboard, so that they may not likely be used for lighting pipes, but may be hung about in the houses for reference. I should like to see them generally distributed throughout the town, and I am certain that they would do a great deal of good.

Secondly, I don't think we can speak too highly of the results of the hygienic improvements for which this City has been so long famous. Your papers, Sir, and Sir Henry Littlejohn's report, have demonstrated the extraordinary saving of life which has resulted from the improved hygiene of the

past thirty years. I remember when the City first awoke to the necessity of such measures. At a dinner of the Royal College of Physicians, Mr William Chambers, the Lord Provost, announced that his ambition was to reduce the mortality of every district of Edinburgh to thirteen per thousand. Sir James Simpson said: "Well, if you succeed in doing that, I shall move that you be "made an honorary member of the Royal College of Physicians." If your Committee goes on working as it has been doing in the past in the way of improving the general hygiene, it will go a great way towards fulfilling the ambitious aspirations of Lord Provost Chambers.

Thirdly, I cordially support Sir Henry's observation with regard to insisting upon the removal of dust from stairs, from houses, from workshops, and schools, and the proper ventilation of these. I think his suggestion of pumping up a proper supply of salt water to the reservoir on the Castle Hill, one of the most refreshing that we have had in Edinburgh for some time. To see the streets watered, the closes flushed, the common stairs washed down, and many other useful things accomplished by the waters of the Forth, would be a magnificent improvement. I should like to see it carried out, and I hope when it is, the authorities will keep in view the wise remark of the President of the College of Surgeons about the possibility of laying down two sets of pipes at one time, so as not to have the streets turned up with unnecessary frequency.

Fourthly, with regard to the possibility of preventing tuberculosis by guarding the milk supply, it is impossible to entertain, in the light of ascertained facts, the slightest doubt. There is no need to refer to the evidence as to the frequent occurrence of tubercle bacilli in milk, or to the great liability of cows and their udders to tuberculous disease, but I must refer to cases such as come under the cognisance of physicians. How often do we meet with tubercle of the intestines and the abdominal glands, as a result of such infection? And perhaps other sets of glands may be similarly invaded. It is too painful a thing to see a healthy child go to the country, and to see it come back out of health with enlarged tonsils, and to discover in the tonsil a tubercular process going on, and then see the glands of the neck becoming enlarged, and ere long a surgical operation becoming necessary to save that child's life. It is true that such an infection may be derived from other sources, but it also may be due to contaminated milk. And to observe a single such case is enough to make one earnest about taking steps towards the protection against the dangers originating in the dairies. I see here some (particularly Dr Foulis) who have done a great service to the community by proclaiming the dangers of milk and the methods of sterilising it, and they will speak to these points later on in the discussion. I shall, therefore, not detain you by further reference to it, only I would insist upon the right of citizens to have the milk supply freed from tubercular contamination by inspection and tuberculin testing of cows, and thorough inspection of milk.

Fifthly, as to tuberculous meat, although it comes only at a very long interval after the question of milk, still it has its own place, and is worthy of attention.

Sixthly, with regard to the question of sanatoria. I am very anxious, not only that they should be established, but that they be made attractive, so that people would willingly resort to them in the early stages of phthisis. The experience of the Victoria Hospital has shown that, even in our climate, the methods employed by Dettweiler at Frankenstein may be not only safely but advantageously employed, and I hope that they will obtain at the hands of the community here a fuller and ampler trial.

But, seventhly, it is most desirable that the community should have power to deal, by removal or otherwise, with patients in the later stages of phthisis, when isolation becomes so necessary. When a patient has reached the advanced stage of the disease, has large cavities in his lungs, and is the subject of mixed infection, he is necessarily a source of danger to his neighbours, especially if they occupy a crowded one or two-roomed house. Some plan for dealing with such cases must be devised, and the only one, as far as I can see, is to have the power of compulsory removal. But that is a difficult and thorny subject, and I shall not further enter upon it at present. There can, however, be no doubt as to the urgent necessity for compulsory disinfection of the rooms in which such cases have been treated. And I think it is equally clear that the City ought to provide a hospital of refuge for such advanced cases, as it might be necessary to remove from dangerously overcrowded homes.

Lastly, with regard to the difficult question of notification, I think, although

from the medical point of view it would be most desirable, yet, as Sir Henry Littlejohn has said in his report, we are scarcely yet in a position to propose it as a regular compulsory measure. But I think it possible to devise a method whereby we might secure a fair system of notification without attempting to make it at present legally compulsory. This might he accomplished by some such plan as the following :—It is essential that the Town shall, sooner or later, provide for accurate and thorough investigation of the expectoration and other discharges of people suspected of phthisis, or other forms of tuberculous disease. Now, that work is being done at present by the laboratory of the Royal College of Physicians, and it is being done, or is to be done, by that of the College of Surgeons, and, of course, it is done in the Public Health Laboratory of the University. It is very largely done—far more than most people know—in connection with the Victoria Hospital for consumption. Now, it is, in my opinion, clear that the City must take up that business itself. It must have an organisation, or bureau, or arrangement of some kind, by which that testing shall be done rapidly and efficiently. The busy doctor has scarcely the time to do it. It is not very difficult to find the bacilli when they are abundant, but it is very difficult to make sure about their *absence* in a doubtful case, and, therefore, the testing should be in the hands of people well experienced in work of the kind. I think that either the College of Physicians' Laboratory, the great Public Health Laboratory, about to be built in the University by the munificent gift of Mr John Usher, or the College of Surgeons' Laboratory, or the Victoria Hospital Laboratory should be taken up and subsidised and utilised by the City, or that the City itself should establish a laboratory in which such researches should be conducted. What I should like to see is that every person who sends sputum there shall, confidentially, give the name and address of the individual whose sputum it is, and thereby the authorities in the bureau would come to know all through the town the places where phthisis had become established, and where virulent and dangerous cases appeared. In such a way as this the information could be acquired by the authorities without the enactment of any new law of notification. I should like to have this idea considered. I have no doubt that plenty of objections may be urged against it, but I think that it is quite sound, and would be found to afford eminently useful results, perhaps the best that we can attain to in the meantime.

Professor JOHN CHIENE, President of the Royal College of Surgeons, said—Speaking on behalf of the Royal College of Surgeons, of which I am the temporary head, I need not say that we endorse every word that my fellow President has said with regard to our thanks for being asked to come here to-day as members of the medical profession in Edinburgh. The College of Surgeons will always desire to do everything they can to help the health of this great community. I am not prepared, as Dr Andrew is, with Fellows from our College, to speak on this present occasion. I asked several of them, but they desired to come and listen to the Fellows of their fellow College with regard to this matter. I would just say one word myself, and it is this, that what I am to say is merely my personal opinion, and not the opinion of the College over which I preside, because that College has not yet had an opportunity of discussing, as a body, this important question. I wish to make a remark or two, first, with regard to notification, and, second, with regard to the milk supply. With regard to notification, I believe that any attempt at that, at the present moment, would be in advance of public opinion, and no laws can ever compel people unless the people themselves are desirous of following those laws. I think the result of notification, at the present moment, would be a desire on the part of those who believed themselves to be suffering from this disease to hide the truth, and much harm would come from notification from the point of view of information for the authorities, and from the point of view of separation of the cases. I would also draw the attention of the Public Health Committee to the fact that, as far as I can judge, if they make up their minds to proceed with notification, the hospital accommodation that will be required will be infinitely larger than what would be required for acutely infectious diseases. For days in infectious hospitals, the cases would remain weeks in the consumption hospital.

If, from Sir Henry Littlejohn's figures, 5000 is the number of phthisis patients in Edinburgh, probably 3000 of those would require hospital accommodation, and we would need not only to put in the early cases for cure, but

also the later cases in order to prevent them doing harm to their neighbours. From that point of view, therefore, until you have hospital accommodation, I don't think it would do for this City to think of notification. From a surgeon's point of view there is another aspect of the case, and it is this, that if there is notification for pulmonary tuberculosis, then all discharges from tubercular joints, bones, &c., must also be notified. As regards milk, I don't think that the City can step in and apply the tuberculin test to the cows that are in the byres of this City until the tuberculin is supplied by the Government. I think that as long as it is in the open market, and can be obtained by any one, then much harm will come from attempting to apply the test to the cows as we have them at present in our byres. I can believe that it might be possible, if the tuberculin were supplied by the Government, to apply the tuberculin test to the cows that are brought week by week to the City before they are sent to the byres. I can see that it would be possible to have a sanatorium for these cows and have them tested, and, if they are found to be healthy, then they could be sent to the byres. There is an interesting object lesson with regard to the work done in Sunderland in this direction, and I think it would be well if the effect of these regulations were carefully watched to see what could be done in this direction. I see great difficulties in applying, even gradually, the tuberculin test to those cows which are brought into the City, before being sent to the byres. I see difficulties with what we are to do with the cows now in the byres, whether we are to apply the test to them, or to keep the cows which have been tested separated from the other cows. I understand that a cow is a year in the byre before it is sold to the butcher, and in one year we could work out all the present cows if we could see some way to separate them after the test has been applied. I also see another difficulty, and that is, what are we to do with the milk supply that comes in from outlying districts beyond this area? And then I see, as Sir Henry Littlejohn sees, the difficulties with regard to compensation. It is not so much the expense of compensation, but it is the danger of fraud with regard to compensation, and that can only be prevented by the tuberculin test being under the Government, and supplied by the Government. Before I sit down I think I might mention one or two things that, in my opinion, I think we might do. There is doubt about notification, and what we should do with regard to the milk supply, but there are one or two things which the town can do. The first thing that I would draw the attention of the Public Health Committee to, is the importance of that clause in Sir Henry Littlejohn's report where he refers to the value of flushing. He suggests that the sea water might be brought up for this purpose. I think that that might be considered by the Committee, because I see a tremendous advantage in flushing our closes instead of sweeping them; it would be infinitely better. I understand a reservoir is available, and as gas-works are to be laid down at the seashore, and pipes are to be brought up from the gas works, I think that when they are being laid, pipes should also be put down which could carry up the sea water, and then we would have a supply for the flushing of our closes. I need not dwell upon the importance of the leaflets which should be published to educate the people. Then there is the importance of having a town hospital with a hundred beds, for people who are acutely diseased, and who are prepared to go into hospital—I mean people whose lungs are breaking down, and who are spreading danger in every direction, and I think that some effort should be made to carry out that part of the report. Then I would wish the Public Health Committee to consider very carefully that part of the report of the British Medical Association which directs attention to the important laws which have been laid down for the infectious hospital at Crewe, in which they have made rules and regulations with regard to the milk supply, so that non-tuberculous milk can be supplied to the patients in the hospital. If that can be done in Crewe it can be done in Edinburgh, and pressure should be brought to bear on public institutions in this city that they get their milk on the same principle as the infectious hospital of Crewe is now getting it. I thank you, gentlemen, for listening to me.

Principal WILLIAMS said—I should like to ask if it is clearly understood that Sir Henry Littlejohn's report deals with pulmonary consumption only.

The CHAIRMAN—We are only on the question of pulmonary consumption. I now call on Dr Muirhead to speak as to the curability of the disease.

Dr Claud Muirhead said—It is an old adage that says "prevention is "better than cure," and perhaps in no circumstances is the wisdom of that saying more applicable than in the present instance. For, I believe that our most conspicuous success in our war against this most prevalent disease will be in exact proportion to the ability with which we shall counteract those conditions which predispose the individual to the successful invasion of the tubercle bacillus.

But, in saying this, I by no means wish you to infer that I believe consumption to be incurable—far from it—it is curable. Pathologists are well aware of this fact, that Nature herself has unaided brought about a cure in many a case, the individual having died of some quite independent disorder. We also, as physicians, have the satisfaction of knowing that we have aided in the cure of certain cases of consumption. Saying this much, you will ask why is it that there are so many deaths and so few cures? The reason is partly to be found in the fact that the disease is a very insidious one, and is latent for a long time, weeks, months, and perhaps years before the subject of it recognises that he is really an invalid. In this way it differs from an acute attack of inflammation of the lungs, where the suddenness with which he is attacked, the intense fever, the extreme breathlessness, and surprising weakness at once arrests the attention of the sufferer. In the former case the disease may go on for months without the individual becoming aware that he is a subject of the disease. He knows that he has a cold, but he pays no heed to it; and here I should like to interpolate that I think much benefit might be conferred on the public were it duly impressed upon them that these colds are often the beginning of the disease,—the cold that hangs about a man, and which he disregards either because he thinks the ailment trifling, or because he feels the necessity of working at his business for the sake of his family. I would suggest that there be put in the leaflet some hint to the effect that colds often assume a serious aspect, and that they often lead to very serious disease.

But to revert to my thesis, "the curability of phthisis," I must mention one plan of cure which is much in evidence at present, and is much before the public, viz., that carried out in the sanatoria for consumptives. I cannot enter upon the discussion of that subject, as I know that it has been allocated to another speaker, but at the present time we have heard a great deal about them, and they seem to be the favourite method of cure. I should just like to throw out a hint that possibly these sanatoria may not prove to be such a wonderful success as we are led to believe them. We have heard much of the cases that have received benefit from them, but we hear little of the cases that are not a success. I should also like you to recall to remembrance that not so very many years ago it was announced to us from abroad that a specific cure for consumption had been found, and only after a very short trial came the woeful intimation that this cure had proved to be anything but a cure. I would, therefore, have us receive this new doctrine with something like caution, and not allow our enthusiasm to carry us away with the idea that every case that shall be sent to the sanatoria is certain to be cured. A certain number will be cured, others will be materially improved, another percentage may have their condition ameliorated, but others will remain unimproved, and some will die. Curable, therefore, as I believe consumption to be in the early stage of the disease, I do not believe that every case is curable, neither do I believe that you will ever be able to cope with it as you can with typhus fever, or hope to stamp it out as you possibly may do typhus. You may greatly reduce the mortality from this terrible scourge, and I sincerely hope you may, but consumption will be always with us.

I shall detain the meeting no longer.

Dr Affleck said—I don't intend to detain this Conference for any length of time, because many of the points that I wished to take notice of have already been referred to. I have been asked to allude to the question of sanatoria for the cure of consumption, and also to the subject of hospitals for the reception of cases advanced and likely to die, but which might be removed from the community, where they are sources of danger. With regard to the former of these, I must say that I have followed, with great interest, like my brethren, the accounts that have been given of the methods of treatment at the sanatoria that have been established for the cure of consumption both at home and abroad. I understand, however, that the point that we have at

present to consider is, whether or not there can be any action taken in relation to projects of this kind by our public authorities. Now, the thing presents itself to me in this way. The method of treatment is certainly only on its trial. We are only at the beginning of our experience in regard to it, and I think it better to be left to be worked out on medical lines rather than that any experiments should be undertaken by our public authorities. For that we require time. We require careful statistics; we require to watch the subsequent history of the cases, and to have records of non-successes as well as of successes before we can estimate the value of such a treatment as that. Therefore, I think, in regard to the practical point of the relation of the public authorities to these sanatoria, while they might indicate their sympathy with the objects in view, and give encouragement in various directions, yet any active support which would involve the community in expense for the establishment or upkeep of such sanatoria could hardly be recommended at the present time. It is quite possible that in the course of time such a position may be desirable, but it seems to me that at present the subject is too immature for active dealing on the part of the municipality.

In regard to hospitals for the reception of patients in the advanced stages of phthisis, there are one or two points which strike me. I think one must never forget the great work that the Royal Infirmary of Edinburgh has done for the benefit of patients suffering from phthisis. Whatever we may think of the disadvantage of dealing with cases of phthisis in a general hospital, there can be no doubt that an enormous amount of relief has been and is given by our Infirmary to sufferers from phthisis. Those of us who have been medical officers in the institution know how many applicants go there for relief, but we can only take in a limited number of the cases applying for admission. I have seen in certain quarters a tendency to minimise the benefit done in this way, and to indicate that general hospitals don't want such cases. We are always glad to take as many such cases as we possibly can. No doubt there is the possibility of danger to others, but after all this does not appear to amount to much, although it will not do to ignore it altogether. I endeavour, in carrying out the treatment of phthisical patients in our Infirmary, to keep those cases by themselves as far as can be done; to remove them away from patients constantly in bed, and I think that precautions of that kind can be used with some benefit.

With regard to the suggestion contained in Sir Henry Littlejohn's report, in which he says: "These remarks refer to confirmed cases of the disease, with "regard to which it has been often urged in medical circles that it would be of "great advantage, as far as the spread of consumption is concerned, if one "hundred beds were available in the City for their reception." That would be a most beneficent project undoubtedly, but I would like to draw the attention of the meeting to the fact that these hundred beds, or any number of beds, would stand upon a very different footing from the beds in a fever hospital. Fevers run a more or less definite course, and you can look for a regular turnover of patients, but if you admit cases of advanced phthisis into a hospital, you may take it for certain that a large number of these will be fixtures for a length of time. Some of the most desperate cases that come to our Infirmary get wonderfully better after a while. Suppose that at the beginning of the year you put one hundred patients into the hospital, at the end of the year a large number of these persons would probably be still alive and in the hospital, because if you are to do any good to the community you must keep these cases in until they die, and you cannot send them out again. Therefore, the turnover of patients in the course of a year would be comparatively small. I don't wish to indulge in any unfavourable criticism of this benevolent idea, but I think it right to point that out, that inasmuch as many of the cases of phthisis undergo wonderful improvement, a hospital of the kind would be less available than some persons might think for taking in and removing from dense centres of population any great number of cases of advanced phthisis. No doubt it would do good, but it would only touch the fringe of this large subject.

Professor GREENFIELD said—I feel some diffidence in speaking on this subject in the presence of so many who are better qualified to deal with it, and I fear that it may be difficult to do more than outline certain points within the limits of time.

The subject on which I am asked to speak is "Liability to the Disease,"

i.e. to pulmonary consumption. And I suppose this to mean, what conditions are there which are capable of control by a public sanitary authority, which either (1) tend to increase liability to the disease, or (2) in the case of those who are from any cause especially liable to the disease, what special precautions are necessary and possible?

I think all medical men will agree with me, that everyone is liable to infection by tuberculosis. And we are agreed that certain races, families, individuals, and ages are especially susceptible.

On the other hand, there is a great *power of resistance* both to infection and to the spread of the disease within the body. There is also no doubt that this power of resistance can be either *increased* or *diminished*, especially by conditions of general sanitation and health by the presence or absence of other disease. And, as in all other infectious disease, the power of resistance may be overcome by the *intensity* of the infection or by *prolonged exposure* to it. These are facts which are common to medical science. There is one fact which is well known to medical men, which is not sufficiently recognised by the laity that a large number of the population are infected with tuberculosis. But, so long as the disease remains local and quiescent, it may be without effect on the general health, and may remain dormant and unsuspected. So long as this is the case, it may not spread in the body, or produce those destructive changes in the lungs which we call pulmonary consumption. It is, therefore, not only the *spread of infection* of tuberculosis which we have to consider, but the *prevention of those conditions which excite* and cause the *spread of tubercle in the body*. This must be especially borne in mind in relation to consumption. Speaking first of those conditions which are known to diminish liability to tuberculosis, there are certain well known conditions of general sanitation which reduce the mortality. Statistics have shown that there is much less mortality from consumption where there is good *drainage*, abundant *air-space, ventilation, sunlight, and absence of dust*. These conditions, which are largely under the control of the sanitary authority, do largely affect the incidence of consumption and of death from it. With regard to *drainage* and *dryness of soil*, I need say nothing, as these are so well looked after in Edinburgh. But there are parts of the City, especially in some of the new suburbs, where such questions may need special attention. I need hardly refer to the classical instance of Salisbury, and the results of the investigations of the late Sir George Buchanan, in the diminished mortality from respiratory diseases, including consumption, which followed attention to this point. The next point to which I may refer is what may be called *air-space*. And I would ask whether this question is being sufficiently attended to, especially as regards the erection of tenements, which is constantly going on in the extension of the City. Long rows of tenements are being erected, with a space between them which is entirely insufficient for proper ventilation, and from which sunlight is practically excluded, and which are in defiance of all known laws of sanitation. Cannot the City do something to diminish the erection of these lofty tenements, or to ensure that there shall be sufficient air-space between them, and that they shall allow the entrance of sunlight? I am sure that Sir Henry Littlejohn will agree with me in this. Another point is with regard to the *ventilation* and *cleansing* of common stairs. I am glad that Sir Henry Littlejohn has called attention to this, and I fully agree with him in what he says on the subject. And I fully concur in his view, that they should be open if possible, or at least thoroughly ventilated. But there is another point to which I may refer with regard to these tenements, viz., as to the *plan of their internal construction*. Most of us know that even in middle-class tenements the possibility of thorough ventilation is small, owing to the plan on which they are constructed. No doubt there are difficulties in this matter, but it is especially important where the mode of disinfection commonly adopted, viz., by fumigation, depends for its efficacy almost entirely on the possibility of thorough ventilation. Upon this point I have the support, not only of all scientific investigation, but of the most eminent practical sanitary authorities of Great Britain. And I think that the health authorities should call the attention of builders to this point, and endeavour to arrive at some method of construction which would ensure the possibility of thorough ventilation. With regard to internal construction, there is another point to which I should like to call attention. A large number of young people, students for instance, live in rooms let as lodgings, in which the bedroom is simply a small cupboard opening

off the sitting-room. Now, I would point out that not only is there insufficient ventilation in these rooms, but that there is no guarantee that if the room is occupied by any one suffering from infectious disease, and especially by consumptives, the room may not be continuously occupied by others, and thus the infection be carried on. I think that in the case of rooms which are habitually occupied as lodgings, the sanitary authorities ought to have power to ensure a thorough periodic disinfection and cleansing, and that they should also acquire powers to inspect them. With regard to these, notification of consumption would be of considerable value. I should like next to make some remarks on the statistics embodied in the Report of the Medical Officer of Health. I would point out that, as regards liability to consumption, *statistics of the death-rate* of a city are misleading, unless we consider them in relation to other well-known facts. I may first refer to the question of the *death of children from tuberculosis*. Now the reason why more cases of such deaths are not recorded is that they are not returned as "pulmonary consumption," but as some other tubercle disease. [A glance at the returns of the Registrar-General will show this.] We know that in many of these cases there is actually pulmonary consumption, but as children do not expectorate, and tubercular disease of other organs is prominent, they are returned as cases of other forms of tuberculosis. And it is especially important to bear this in mind, as regards the liability of children to infection by milk and from other sources.

There is another point in regard to which statistics are fallacious. The death-rate from pulmonary consumption in a city does not indicate the amount of *spread of infection*, because in all cases where it is possible, we send the patients into the country or abroad, in order to give them a chance of recovery; and, if they die there, their deaths are not recorded in the city, and the death-rate of the city is not raised.

Of the other conditions which tend to the increase of consumption, I may next refer to DUST.

Dust is not only a carrier of infection, but it also sets up changes in the lungs which make infection by tuberculosis easier, and excite destructive changes.

It is a well-known fact that all the diseases of the lungs which are produced by dust (what we call "dust diseases"), with the one exception of coal dust, are usually complicated by the presence of tuberculosis. I am glad that Sir Henry Littlejohn has called attention to this point. And I think that the attention of the Cleaning Committee might be called to this, especially in relation to the distribution of dust from houses and closes.

Quantities of refuse from houses and closes are deposited on the street and distributed by the wind whilst awaiting removal by carts.

The second group of questions relates to the presence of unavoidable conditions in which there is increased susceptibility to infection, and with regard to which special care is needed to avoid the sources of infection, so far as they can be dealt with by a sanitary authority.

There is not the least doubt as to the greater susceptibility of children to tuberculosis. This is especially the case in children who are suffering, or who have recently suffered, from certain zymotic diseases, especially measles. And also, overcrowding, insufficient ventilation, and defective food are especially capable of increasing the susceptibility to tuberculosis.

There are schools in this City, not board schools, to which the attention of the Local Authorities should be drawn. My attention has been especially directed to this point by a number of cases of tuberculosis in children who have been in one particular group of schools, who have developed insidious and often fatal forms of tuberculosis. In some of these schools the children are often practically deprived of food from eight to half-past three, or later, the class-rooms are crowded and insufficiently ventilated, and there is no arrangement for exercise, and there is much night work. I think that this matter urgently demands attention.

In the same way, the condition of some workshops demands fuller investigation. I do not know how far this is controlled by the factory acts. But I have myself seen places in which sanitary conditions are notably absent.

Exposure in artificially-lighted rooms with a number of workers, and the possible presence of an infectious case of consumption, undoubtedly tend to infection, and I think that, especially in the case of all kinds of workshops and factories, there should be some means of control by the Sanitary Authorities, particularly with regard to cases of known pulmonary disease.

With regard to *infectious diseases*, I would point out that the great majority of cases are in children, that they are at a very susceptible age, and that their power of resistance to infection is lowered, and infection by tuberculosis is thus rendered easier.

I believe that in the vast majority of cases the infection of consumption is conveyed by contagion from one person to another, especially by the sputa. But we must allow also the possibility of infection by milk, and it is therefore very important that children in fever hospitals should have the milk sterilised (or that it should be free from possible tuberculosis). And I must confess that I do not think there is any difficulty in sterilising all the milk in a large institution. I have not ventured to inquire whether this is done in the Royal Infirmary or in the City Hospital. But I think that such institutions, as well as all like institutions in which there are numbers of children or susceptible persons, might set an example in this respect.

And this more especially in hospitals, because such cases live largely on milk for some time, and are highly susceptible of infection.

I must apologise for occupying so much of your time, but I feel sure that without attention to these points, any other measures to prevent the spread of infection by tuberculosis will be ineffective.

Dr R. W. PHILIP said—Mr Convener, in responding to your call that I should say something on the question of notification, I should like to make two admissions. The first is this, that I conceive notification to be the only logical solution of the tuberculosis problem. On the other hand, I believe that medical opinion, and I suspect public opinion, is not sufficiently formed to admit of our pressing compulsory notification at the present time. My second admission is therefore, that, with Sir Henry Littlejohn, I hesitate to insist on notification meanwhile.

With these admissions, the question which appeals to me, and which will appeal to you as a Public Health Committee is, Is there a possibility of arranging a system which will approximate the same end without the disadvantages urged against notification in the ordinary sense. I think this is possible. Let me at the commencement say that any movement against tuberculosis, to be complete and effective, must be well organised. This statement is the result of considerable thought and experience in elaborating measures for the treatment of this disease in Edinburgh during more than ten years.

I would like to explain to you what I mean by organisation. It ought to include the establishment of a central office or dispensary or bureau—I should not wish to quarrel as to the name—under the direct supervision of the Medical Officer of Health. This central bureau should receive and afford information on all tuberculosis matters. At that institution consumptive patients should be invited to apply for advice and treatment, and towards the institution I think such patients from other dispensaries should be directed. I feel certain that all the medical charities of the City would be glad to co-operate with the City in this matter. If such means were adopted, not only would treatment be effected, but a great educational movement would be carried on with regard to the prevention of the disease. This institution should have, further, some means of providing for medical attendance on, and even for the nursing of, bedridden patients at their own homes, when hospital accommodation is not available. Such nursing might be managed in co-operation with some of the existing nursing institutes. In this way, along with relief, an enormous amount of education as to prevention would be afforded. The institution would also take in hand to issue and disseminate printed instructions regarding prevention and disinfection, such as have been alluded to. Since 1891 precise instructions of this nature have been circulated by an institution of which I happen to be Medical Officer, and I venture to say that a large amount of information has thus been provided. Further, this central institution should have power to undertake, either directly or in co-operation with one of the existing laboratories in the City, the examination of all tuberculous or suspect expectoration sent for the purpose, the name and address of the patient being furnished by the sender. Lastly, the institution should receive official intimation from the City Registrar when a death occurs from pulmonary tuberculosis within the municipal boundaries.

The outcome of all this would be that by means of the addresses furnished by patients treated by the institution, and persons sending expectoration for examination, and those obtained by notification of deaths, etc., the City would

be put in possession of a very large mass of information in connection with the subject. Such a system seems to me to afford a potential notification without the disadvantages which are said to attach to the more rigid and compulsory method. It is, moreover, a system that might be introduced almost to-morrow. For nearly all those lines of prevention and treatment have been adopted by an organisation which has existed in the City of Edinburgh for some twelve years.

In addition to what I have thus rapidly sketched, I would venture to suggest that the central bureau should have relationship with all existing hospitals and with hospitals to exist in the future which are prepared to receive cases of pulmonary tuberculosis. In this way the bureau would afford information to all inquirers on tuberculous matters, and should be able to advise the different classes of patients where they might apply for hospital accommodation. Thus a consumptive pauper would be directed to the parish hospital, a person with limited means would be sent to some hospital run on benevolent lines, and so on. The hospitals would in turn provide the bureau with the previous addresses of all consumptive patients in residence. Am I going too far if I suggest, in conclusion, that such an organisation might dream, at least, of the realisation of something like tuberculous colonies? The solution of one of the ultimate difficulties, which every community must face, will be found, in my judgment, in the establishment of a tuberculous colony away in the hills, let us say, where affected persons, while contributing to the common good, would remain under medical supervision. Tuberculosis is a big question, and in order to meet it, we must use big measures. If such organised methods, even in less expansive form, be adopted by the Public Health Committee, Edinburgh will be a long way in advance of anywhere else in relation to the prevention of tuberculosis.

The CHAIRMAN—It is now 5.30, and we have only had seven speeches, which is a good number for the Town Council to have in the same time. But we should be glad to have a little more if any gentleman would like to supplement what has been said. May I say that we have to separate in our minds the purely benevolent aspects of the question from the economic aspects. It is the economic aspect that we have to deal with as Local Authority.

Professor HUNTER STEWART said—We have heard so much about prevention of the spread of consumption, and so much that is altogether right, but we have overlooked the fact that disinfection is a thing to go hand in hand with any course you may adopt. Take the case of a man who comes to a hotel and is a bad consumptive, and engages a room—now there should be some means whereby the landlord could inform the Local Authority, and that room should be disinfected efficiently. Then, of course, after a man dies of consumption, his house ought to be disinfected with the greatest thoroughness. There is no need of notification in such cases, as the cause of death can readily be seen in the weekly returns of deaths at the Register House. The next tenant runs the risk of getting infection, and this should be removed as far as possible by disinfection. I think the Corporation might do well to take a leaf out of the book of those cities, New York, Paris, etc., who, in their efforts to reduce the amount of consumption, are greatly increasing their disinfecting staffs. In my opinion, notification is almost a useless expense, if it is not followed by disinfection, and a much better return may be expected from increased expenditure in the disinfecting department. Facilities would thus be given for disinfection, not only in the cases already referred to, but also when it was voluntarily requested by the patient or his friends. This, I think, is a matter the Corporation ought to keep before them as a very important means of preventing the spread and the origin of fresh cases of consumption.

Dr JOHN DUNCAN said—I came here quite unprepared to speak, not having seen anything except the admirable report, with which I would be inclined to agree in almost every particular. Although this discussion is limited to phthisis, yet it applies to every form of tuberculosis. As Professor Greenfield has pointed out, we surgeons are more in the habit of dealing with other forms of tuberculosis, those in the abdomen, the head, the joints, and the glands, which cause a larger mortality among children than even phthisis. No doubt it is in connection with such cases as those that the milk and food supply becomes most important. It must, for example, reach a joint through the blood, and it generally has got into the blood through the food, so that that aspect of the case appeals to the surgeon very strongly.

Sir JOHN BATTY TUKE said—I have a practical suggestion with regard to the prevention of consumption, and that is, that you should urge on the Cleansing Department to lock up those roller brushes till such time as the suggestion in Sir Henry Littlejohn's report, regarding the watering of the streets with salt water, is brought into effect. I have often walked along Princes Street in the summer evenings, and found those rollers throwing the dust up above the house tops, so that you could not see the roofs, and that is done at a season when most windows are open. The rollers are admirable in their way if the streets are first watered, but if we found on the germ theory of disease, I believe at present the Town Council is doing a good deal in giving work to the doctors, as the dust, charged with dried tubercular sputa, and the germs of other diseases, are disseminated in the most convenient manner for them to take action.

Dr JAMES said—When I received notice to attend this meeting, I thought of the special points in connection with which advice from medical men would be required. There is, I believe, much that might be said in the way of criticism upon what has been stated lately about consumption. But on coming before you now, I think that we, as medical men, have only to give you, as it were, our individual opinions, and you will be able by-and-bye to weigh in the scale the value of such.

Now, the question I thought of was, first, can we hope to stamp out pulmonary consumption by acting towards it precisely in the way in which we act towards small-pox and scarlet fever? To this I say no. The tubercular germ is an organism, the powers for harm of which are so greatly dependent on the conditions of the individual, that it is practically different from the organism of scarlet fever or small-pox. A perfectly healthy man may have tubercle bacilli in his organs or tissues, and as long as his health remains good, it does him no harm. But if his health is lowered by insanitary conditions, bad air, sedentary life, etc., or if hereditarily he has a weakly constitution, then the tubercle germ can get to work. I think that we, in our efforts to combat pulmonary consumption, should always bear in mind the statement of the French physician Beau that "pulmonary consumption is a "disease which does not begin, but which finishes." The second point that I thought might be referred to was the maxim in science which says, that the conditions which favour the individual life of an organism are the conditions which, if persisting, will bring it into existence. We know that the conditions which go to favour pulmonary consumption are confined atmosphere, overcrowding, want of sunlight, etc. These conditions favour its spread, and it is not unscientific to consider that these same conditions will either bring it into existence or at least enormously increase its virulence. This assertion may seem heterodox at present, but it is not more so than the opinion which one of the highest authorities on fever—Murchison—held as regards typhus fever. He held that with overcrowding and filth, the germ could originate *de novo*. Whether this is true or not, you all know that if in your attempts to stamp out typhus fever, you limited your efforts to checking infection from the typhus patient, you would never succeed in removing the disease. What is true of typhus, is true much more of tubercle, and I firmly believe that if you killed off every tubercle cow, and banished every phthisical patient, leaving, however, the conditions of life of the cow and of human beings as they are, you would have tuberculosis back again in a very few months. And now for the practical points. In what we should do we should bear in mind, that, whilst the germ of scarlet fever and small-pox comes among us, as it were, as a foreign element, and its extension is aided by overcrowding and unhealthy conditions, the germ of consumption is, as it were, begotten of the unhealthy conditions themselves. It has been pointed out in your statistics that, whilst your sanitation, disinfection, isolation, etc., has greatly diminished zymotic diseases, pulmonary phthisis has not been improved to the same extent. This is just what we would expect from the nature of the tubercle organism, and the improvement is quite as good as anyone who knows what consumption is would expect. But, in connection with houses and with workrooms, there is still very great room for improvement, and it is from working on these lines that you can hope to attain the greatest good. As regards the isolation of phthisical patients, I think that practically this should be limited. When a doctor meets with a case of consumption, unable to work, confined to bed, and really dying slowly in a house with confined air, and inhabited, probably, by more than the number for which it is fitted, then I think it would be for the good of the community

that such a case would be removed, and I would approve of a scheme for a hospital such as the one which has just been indicated.

The CHAIRMAN—I don't know whether any of my colleagues would desire at this stage to ask any question.

Mr Councillor MENZIES said—I would like to ask, for the guidance of this Committee, whether any of the representatives of the medical profession present would advise us, as a public authority, where we are to start with remedial measures, whether we should start at the advanced stages of the disease, to try and do what we can to prevent the spread of disease. I take it that there are three stages which should have our attention, the advanced stage, which probably we ought to attack first to prevent the dissemination of the disease, when a man or woman is laid up and unable to work for themselves or their families. In the first stage of the disease, when it is curable, should not a sanatorium be set up, either by voluntary subscription, or, if that cannot be got, by legislation, where we could invite those who have become ill and who would be willing to come (all would be willing, I should say, if they understood thoroughly that they had a chance of being cured). As to the intermediate stage, I can see that it is surrounded by a great number of difficulties. In consequence of people ill with the disease having to earn their own livelihood or the livelihood of their families, you could hardly remove them from their work by force of law, unless you were prepared to provide for their families and themselves. Therein comes the great difficulty. There is another difficulty, particularly in workshops, where you have men working, and the others know that danger would arise to them in consequence of these men being allowed to be there. Whenever it becomes known that a man is ill with consumption, he is often dismissed from employment, and consequently want and starvation stare him in the face. Now, I would like very much if we could get any direction for our guidance as to where we ought to begin, whether in the later stage of the disease or in the first stage, leaving the intermediate stage to itself in the meantime.

The CHAIRMAN—Can we be assisted by any gentleman present in reply to Councillor Menzies?

Dr WYLLIE said—It seems to me that the most reasonable course would be to take the most advanced stage. It would be necessary, I conceive, for the town to select very advanced cases indeed, cases the most dangerous of all, because, as Dr Affleck, I think, forcibly pointed out, if those are selected who are not very far advanced, then the hospitals would be speedily filled up, and would become comparatively useless. I agree with Dr Affleck that even a large hospital devoted to consumption in the last stages would have a comparatively small turnover in the year, but if great care be exercised I think you could do useful work in selecting cases that were a source of great danger to the surroundings.

The CHAIRMAN—May I ask if, in your judgment, it is our duty to do so?

Dr WYLLIE—I think there is a duty on the Council to remove such cases if it can be effected, and I think it can be effected.

The CHAIRMAN—Then may I take it that Dr Wyllie's answer is concurred in by the gentlemen present? (Agreed.)

Dr CAVERHILL said—I would advocate the addition of consumption to the list of notifiable diseases. I submit that if a sanatorium were erected for advanced cases of consumption, it would be of little use to the community in checking the spread, unless the Notification Act were in force. The powers given by that Act are rarely exercised, and only in the case of dangerous infectious diseases, for the knowledge that the sanitary authority have legal powers of removal is, in nearly all cases, sufficient to get the patient's consent. Without the Notification Act, it would be found that, as no pressure could be exercised on those who ought most of all to be selected, the sanatorium would be filled up by those cases living under conditions least dangerous to their friends and attendants. Even with the Notification Act in force, no sanitary authority would dream of taking the extreme step of the compulsory removal of a consumptive when persuasion had proved ineffectual.

Mr Councillor WATERSTON said—I expected one or two remarks on the question of heredity. As far as the Conference is concerned, I am somewhat disappointed. My experience amongst the poor is this, that a very large number of people, in what we call decline or consumption, are undoubtedly the children of consumptive parents. Now, that does not arise from any of the

preventable causes that have been spoken of to-day. I have in my mind the case of a family where the doctor told me that the birth of the children for that mother had saved her life, otherwise she would have died from consumption. I want to get some idea whether you can prevent such cases. How are they to help us in this difficulty?

The CHAIRMAN—May I point out, Mr Waterston, that the question of heredity has been referred to by some of the speakers?

Mr Councillor BROWN said—There is one question I should like to get some assistance on. As laymen on the Public Health Committee we are anxious to carry out, in the best way we can, the powers that are entrusted to us, and one of the speakers to-day laid great emphasis on the need of getting our milk supply in a proper condition. He proposed that steps should be taken in regard to our milk supply. Now, I think that that statement carries with it that what we are presently doing in regard to our milk supply does not meet at any rate with the approval of the gentleman who made the observation, and I quite concur with him that perhaps we are not doing all that we ought to do. I should like to get from the medical men present here to-day some practical information as to what the Public Health Committee or the public officials should do to get our milk supply in a better condition than it is in at present.

The CHAIRMAN—We have here with us two members of the Veterinary Colleges. Perhaps that is a question on which they might give an answer in the briefest way possible.

Principal DEWAR said—With regard to that question, I must say that I cannot altogether agree with some of the remarks made to-day in connection with the procuring of a thoroughly trustworthy supply of milk. It seems, as I understood it, that they would have us wait until the Government stepped in and took the thing in hand, stamping out, and paying compensation. We might as well sit down and wait until the milennium came. "God helps those "who help themselves," and we ought to give every encouragement to those who want a pure supply of milk. I hope the Public Health Committee will persuade their colleagues in the Council to assist them in getting powers to use the tuberculin test in the case of dairy cows within their own boundary where there is a doubt about the disease affecting any cow. At the present time there is no power to order a cow with a diseased udder out of a dairy byre unless the veterinary inspector is able to say positively that the disease is tuberculosis. There are also cases in which the cow seems in a poor state of health, in such a state as makes her very susceptible to disease. In cases such as these, where the animals are getting a good supply of food—and no dairyman will admit that they are not getting a sufficient supply of food—and presenting an emaciated appearance, a veterinary inspector ought to have the power to apply the tuberculin test. There is another thing which I might refer to, and I have been engaged in this matter perhaps longer than many of my friends have been. I have often been a little disappointed at the amount of encouragement we get from our medical friends. If they would advertise for milk for the various institutions with which they are connected, from cows that had stood the tuberculin test, it would give a greater impetus to the elimination of tuberculosis from the dairies in Edinburgh and its neighbourhood than anything that has yet been done.

Principal WILLIAMS said—As a member of this Committee, I thought I should not have been called upon to speak until after I had had the opportunity of reading what the learned medical gentlemen had told us at this meeting, but there is one thing I wish to say, and which, in my opinion, you should deal with, namely, that we should have pure cattle in the town. Even within the last month I have had three specimens of the udders and milk sent to me in which we found immense numbers of the bacilli of tuberculosis. I therefore think that we ought to have the power to apply the tuberculin test to all the cattle brought into the town. It certainly will be an expense to be begin with, but in the course of a very short time, I honestly believe that we will be able to overcome tuberculosis in cattle as we have overcome rinderpest and pleuro-pneumonia.

Mr BROWN said—The other question I would like to point out is, do the medical gentlemen think it the duty of the Local Authorities to try and prevent tuberculosis in the human family? We have had a description of certain houses where, on account of overcrowding on the part of the families and lodgers, tuberculosis is found to prevail. I would like some one to tell us how,

without notification, the Local Authorities can get a knowledge of the disease that prevails to such an extent all over the City.

The CHAIRMAN—I think that that has been so far anticipated by the observations made by more than one speaker.

Mr BROWN—Yes, to this extent, that I gather that, probably with the exception of one gentleman, the bulk of those who spoke were rather against notification. If that is the case, what I want to know is, how are we to get at the knowledge of the disease throughout the City, unless there is notification in some form or other?

The CHAIRMAN—I think we may take it that more than one of the gentlemen have indicated that, apart from direct and compulsory notification, there are means by which, to a large extent, we can become aware of the prevalence of the disease. I think, Mr Brown, that that is the only answer we can get in the meantime. I only wish to say, in conclusion, and in once more thanking you, gentlemen, for your presence, that what I think is in the minds of my colleagues is, that we regard this Conference as merely a preliminary one, and we will take it as a very great service on your part if, in the Medical Faculty of the University and the Colleges, you discuss this subject from the points of view that affect us as a Local Authority most particularly. We wish to prevent the disease, and to do all we can in exterminating it, but there are points from which we must attack it, and from which others have to attack it. It will be an immense service to us if you, against our next meeting, take the trouble to confer amongst yourselves, and be able to advise us more specifically in the way you think our duty can be most efficiently discharged.

I beg to thank you, on behalf of the Town Council and of this Committee, for meeting us to-day.

Dr Andrew having moved a vote of thanks to the Chairman, the Conference closed.

III. PREVENTION OF CONSUMPTION.

Recommendations submitted at the request of the Public Health Committee of the City of Edinburgh by Representatives of the Medical Faculty of the University of Edinburgh, the Royal College of Physicians of Edinburgh, and the Royal College of Surgeons of Edinburgh.

In responding to the request of the Public Health Committee of the City of Edinburgh for suggestions which might be helpful in guiding the Committee in relation to the adoption of measures for the prevention of consumption, the representatives of the Medical Faculty of the University, the Royal College of Physicians, and the Royal College of Surgeons, deemed it advisable to meet and formulate recommendations in common. The proposals which follow may be regarded as the prevailing opinion of the conjoint representatives (hereafter called the Joint Committee). In most instances the opinion expressed is the unanimous view of the Committee.

The Joint Committee restricted their consideration, in compliance with the wish of the Convener of the Public Health Committee, to the Prevention of Pulmonary Consumption. This was the subject of the remit to the Public Health Committee, and it was on this division of the wider subject that Sir Henry Littlejohn submitted his report of 15th December 1898 to the City. It should be observed from the outset that this confines the issues which require discussion more narrowly than if the wider question of tuberculosis had been under consideration.

From communications received from the Convener of the Public Health Committee, the Joint Committee understand that guidance is especially sought with regard to the scope and limits of municipal duty in relation to the prevention of consumption.

I. GENERAL SANITATION.

The Joint Committee indorse the recommendations as to the necessity for, and the efficacy of, improved sanitation made in the report of the Medical Officer of Health. This is not only a most important aspect of the subject, but it is the line on which municipal action is likely to be immediately most effective. In the opinion of the Committee its significance cannot be too strongly emphasised.

As stated in a report on tuberculosis, issued on 18th January 1899, by the British Medical Association, "it is imperative that all sanitary authorities "should put in force the manifold powers which they now possess for improving "the public health, and especially in the direction of providing better ventila- "tion and access of light in all dwellings and workshops, and in all places of "public assembly. The clearance of crowded sites, and the reconstruction of "insanitary house property, under powers already possessed by Local Authori- "ties, is a matter of great importance."

II. NOTIFICATION.

It is admitted by all who have given serious consideration to the subject, that the great desideratum in respect of the question of the prevention of consumption is fuller information regarding the distribution of the disease. The one method of obtaining something like complete information would be compulsory notification, and it appears to the Committee that compulsory notification should be adopted so soon as medical and public opinion is ripe for it. While this is true, it is right to point out at once that the method appears impracticable under existing conditions.

In these circumstances, the question which presents itself is whether any means can be devised whereby—short of compulsory notification—effective information can be made available to the Local Authorities regarding the distribution of Consumption within the City.

It should be observed that such information is especially desirable in relation to the occurrence of Consumption among the poorer part of the popu-

lation, that is to say, among persons living in insanitary and crowded dwellings. It must be borne in mind that, whatever method be followed, the information must be afforded with the patient's consent. Otherwise the method is open to the objection that it either contravenes existing enactments or involves a breach of professional confidence. Further, whatever method be adopted, its efficacy can only be secured if it is directly controlled by the Medical Officer of Health for the City.

Various schemes have been recommended to achieve the purpose. The Joint Committee have considered three more particularly :—

1. Advantage might be taken of the existing medical charities in the City, or, at least, of such as might prove willing to co-operate, in order to obtain a list of names and addresses of persons applying to those institutions for the treatment of Consumption. Such a list could only be provided with the sanction of the individual patients concerned. The Committee believe that this sanction would be readily obtained if the patient were told that thereby the assistance of the Corporation in the treatment of his case might be rendered available.

2. The Corporation might establish a dispensary for the outdoor treatment of Consumption, towards which consumptive patients might be directed from the other medical charities of the City. By coming to the City Dispensary for Consumption, the patient would himself communicate to the authorities the information which is desired.

It may be objected in reference to this scheme that the City has no right to use public money for the relief of sickness. In answer to this, it may be remembered that, when the sickness is a source of danger to the citizens, the authorities do already treat disease. The fact that in the case of the recognised zymotic diseases the treatment is carried out in an isolation hospital, while in the case of Consumption, if the plan suggested were adopted, the treatment would be, in part at least, at the patient's own home, does not affect the issue essentially. In both cases the treatment is undertaken in the interest of unaffected citizens primarily. It is preventive rather than curative in intention. Moreover, in the case of Consumption, several considerations are worthy of special note. (1) Hospital treatment is possible only for a small proportion of the citizens affected therewith. (2) The course of the disease is not a short, limited cycle, as in the acute fevers, but the disease may last for many months, and even years. (3) Effective treatment of Consumption, from the preventive point of view, may be carried out sufficiently well at home, if only proper supervision and directions be afforded.

3. The Medical Officer of Health might invite the co-operation of the Friendly and Sick Societies throughout the City, with a view to their affording access to the names and addresses of such of their members as had been returned as suffering from consumption. Such a scheme is on trial by at least one Corporation. While the procedure proposed is simple, it should be noted that the information obtainable must, in the nature of things, be very partial. A large proportion of affected persons in the lowest ranks—where the communication of disease is most likely—would be excluded from consideration.

4. The Corporation might simply establish arrangements for the official examination of suspect sputa. By this means a list of all affected cases would naturally come confidentially into the hands of the municipal authorities. To this end sputa would only be received for examination on the definite understanding that the patient's consent to its transmission had been obtained.

The value of methods 2 and 3 would consist, not only in the immediate medical supervision of particular cases which otherwise might be neglected, but also in the knowledge of the distribution of cases of the disease and of the sanitary surroundings of the patient which the Medical Officer of Health would receive as the result of the inspection of the dwellings.

The kind and degree of relief afforded would depend on the nature of the case. Some would be treated simply as out-patients, receiving advice from time to time at the Dispensary. Others it would be necessary to treat at their own homes. Others would be directed to one of the institutions available for indoor treatment of Consumption—the Parish Hospital or the Corporation Hospital, if such be determined on, or the Incurable Hospital, or the Victoria Hospital for Consumption, and so on, as might seem best. In every case, the City would be informed regarding the patient's residence, and would thus have an opportunity of inspecting the dwellings of consumptive patients, to an extent not otherwise possible, save by compulsory notification.

The Dispensary would also be a convenient centre for the dissemination of information regarding the prevention of Consumption.

Granted that such a scheme involves the expenditure of public money, the expenditure is small in comparison with the advantages likely to be obtained. The outlay would be trifling as contrasted with the cost of providing hospital accommodation adequate to the enormous number of patients requiring treatment in the public interest.

III. HOSPITAL ACCOMMODATION.

It is impossible, as has been already indicated, to provide hospital accommodation for all consumptive patients. It falls to be considered, therefore, whether it is the duty of the Corporation to supply hospital accommodation at all for such patients, and, if so, at what stage of the disease.

The Joint Committee have weighed the arguments for and against hospital provision, and have concluded that it is well within the scope of municipal duty to provide means of isolation for patients who, in the words of the Medical Officer of Health, "imperfectly nursed in their ill-ventilated and "too often over-crowded homes, are constant sources of danger to the community." In the opinion of the Committee, such provision should be made by the City, but should be restricted to the really dangerous, *i.e.* advanced, cases of the disease. If the hospital is to be of service to the community, from the preventive point of view, such patients must be kept until they die, and it must be borne in mind that the duration of cases, even of advanced Consumption,—more particularly when well cared for in hospital,—is a lengthy one.

IV. OTHER PREVENTIVE MEASURES.

These will include—

(*a*) *The diffusion of information regarding the nature and preventability of Consumption*, through printed leaflets and the like. This is likely to be of much service to the community, and should therefore be carried out by the Corporation as fully as possible. Means whereby this might be arranged have been mentioned in reference to the subject of notification.

(*b*) *Regulations might be framed by the Corporation forbidding expectoration on the streets and in public conveyances*, etc. Spittoons might be placed with advantage in suitable public places, and might be issued for private use in necessitous cases.

(*c*) Since the *bacteriological examination of the expectoration* affords definite proof of the existence of the disease, it is reasonable that the Corporation should provide for the accurate examination of all suspect discharges, free of cost.

(*d*) *Disinfection of apartments*, especially after death or removal, should be undertaken by the Corporation at the City cost.

(*e*) *Milk and Meat Supply.*—While the main source of consumptive infection is undoubtedly the expectoration of a consumptive patient, it must be admitted that the possibility of infection by way of milk, and even of meat, cannot be overlooked.

The risk from the latter source in this city is, thanks to the vigilance of the Medical Officer of Health, negligible. The risk from infected milk is greater, and especially in the case of children, although in them the immediately resultant disease is less commonly Pulmonary Consumption. Apart from fresh legislation, which, to be effective, must take the shape of general rather than local enactments, the danger may be obviated in more than one way. For example, consumers might be recommended to insist on receiving only such milk as was supplied by dairies whose cows had been subjected to the tuberculin test, the public being informed as to the dairies which satisfy these conditions. This might readily be made a condition of supply in respect of public institutions, schools, and even families. Further, the attention of householders and guardians of the young should be drawn to the possibility of rendering all milk free from consumptive taint by boiling it for one minute, or keeping it at a lower temperature (*e.g.* 70°C.) for half an hour.

In name and by authority of the Joint Committee,

JAMES ANDREW, M.D., *Pres.* R.C.P.,
Chairman.

5th June 1899.

THE JOINT COMMITTEE INCLUDED—

Dr JAMES ANDREW, *Pres.* R.C.P. (*Chairman*).
Dr AFFLECK, F.R.C.P.
Dr JOSEPH BELL, F.R.C.S.
Dr BYROM BRAMWELL, F.R.C.P.
Dr CADELL, F.R.C.S.
Dr CAVERHILL, F.R.C.P.
Prof. CHIENE, *Pres.* R.C.S.
Dr R. J. BLAIR CUNYNGHAME, F.R.C.S.
Dr DUNSMURE, F.R.C.S.
Dr JOHN DUNCAN, F.R.C.S.
Dr FOULIS, F.R.C.P.
Dr GIBSON, F.R.C.P.
Prof. GREENFIELD, F.R.C.P.
Dr JAMES, F.R.C.P.
Dr P. H. MACLAREN, *Vice-Pres.* R.C.S.
Dr MUIRHEAD, F.R.C.P.
Dr NOEL PATON, F.R.C.P.
Dr R. W. PHILIP, F.R.C.P.
Dr ARGYLL ROBERTSON, F.R.C.S.
Dr SMART, F.R.C.P.
Dr JOHN SMITH, F.R.C.S.
Prof. Sir T. GRAINGER STEWART, F.R.C.P.
Prof. HUNTER STEWART.
Sir J. BATTY TUKE, *Vice-Pres.* R.C.P.
Prof. Sir WILLIAM TURNER, F.R.C.S.
Dr HERON WATSON, F.R.C.S.
Dr JOHN WYLLIE, F.R.C.P.