ART. V.—*Tuberculosis and Consumption.* By EDWARD P. CULVERWELL, M.A., Univ. Dubl.; Fellow of Trinity College, Dublin.*

PULMONARY consumption is a disease of all countries, whether tropical, temperate or Arctic; of all races, whether white or coloured; of all climates, whether moist or dry, hot or cold; of all levels, from that of the Dead Sea to that of the Alps. The degrees of its prevalence do indeed vary greatly with some of these factors, but they follow only one general law—the disease is less prevalent in the more sparsely populated regions.

Consumption is a disease of all historic times. More than three hundred years before Christ, the Greeks knew that in its early stages, at least, it could be cured by wholesome food and perpetual fresh air, but in later times this belief became generally discredited, and medical science in Europe made little or no progress in the cure of consumption before the latter half of the century just closed. Yet it was well known that consumption did sometimes become cured of itself, even in severe cases, because *post-mortem* examinations of persons who died from other diseases not infrequently revealed the fact that, during some earlier part of their lives, they had lost an appreciable portion of the lung, and that the disease had, nevertheless, healed of itself. The fresh air and good food treatment of consumption has been rediscovered many times. A Scotch physician used it with success in 1750; a sanatorium based upon it was opened in England in 1840, but was closed because of the active opposition it excited; for some years following 1850 Dr. Henry MacCormac, of Belfast, carried on an active crusade in its favour. But although the pioneers of the new and tolerably successful treatment of consumption were our own fellow-subjects, it was in Germany that it first gained a firm footing.

In the far more important matter of prevention, however, England for a long time easily maintained her leading position, because she was foremost in sanitary reform. Factory Acts, improvements in sanitation and in the condition and habits of the poorer classes generally, led to a very marked improvement in the public health. This was especially marked in regard to consumption, in which the annual death-rate fell from 3·8 in

* Mr. Culverwell has kindly acceded to the Editor's request, and allowed him to publish this admirable paper in a Medical Journal.

1840 to 1·9 in 1880. Had proper advantage been taken of Koch's discovery of the tubercle bacillus in 1882, the decrease might have been even more rapid since then, but it has in fact been slower, having fallen only to about 1·3 in 1900.

KOCH'S DISCOVERY OF THE TUBERCLE BACILLUS IN 1882.

From 1865 it had been known that consumption was a communicable disease, because in that year Villemin showed that it could be given to animals by inoculating them with the sputum, or coughed up phlegm, of a consumptive.^a This fact, and Pasteur's general discoveries, had made it practically certain that consumption was a germ disease. Koch was the first to succeed among those who endeavoured to isolate the germ, the appearance of which, when magnified about 1,000 times, is that of a somewhat irregular pencil line, about $\frac{1}{8}$ to $\frac{1}{4}$ inch long.

The great value of Koch's discovery is that it has enabled bacteriologists to trace the life-history of the germ, and so to lay down the principles (not very difficult to carry out, if an educated public opinion helped to enforce them) by which the consumptive germ itself could be as completely banished from the country as the germ of leprosy—a disease to the former prevalence of which not only historical records bear witness but even existing names of places, such as Leopardstown, near Dublin, a corruption of Lepers' Town. But while the means which eradicated leprosy were accompanied with great hardship to the leper, modern medicine has shown that the consumptive germ can be banished, not only without undue hardship to the sufferer, but with great benefit to him.

An immediate result of Koch's discovery was that several very intractable diseases previously believed to be allied to consumption were definitely proved to be due to the same germ. They are all included under the general designation of tubercular diseases.^b

^a In an Italian work, published in 1520, it is stated that "the sputum and breath of a consumptive gives off a strong vapour, which causes consumption in others." It took three and a half centuries to re-discover this!

^b This has given rise to a great deal of confusion and uncertainty in the comparison of statistics. Sometimes the death-rate from tubercular diseases as a whole is spoken of, at other times the consumptive death-rate alone. Moreover, the classification in the Registrar-General's returns has been changed from time to time, so that it is often difficult to be sure of strict accuracy in comparing statistics in different periods or countries.

When the tubercular germ lodges in the membranes of the brain, it gives rise to tubercular meningitis, commonly known as water on the brain, or watery inflammation of the brain. In the superficial glands, especially those of the neck, it develops into what is known as scrofula or king's evil. In the glands of the abdomen it produces tabes mesenterica, commonly known as consumption of the bowels—a fatal disease, chiefly incidental to childhood. It may attack the skin, producing lupus. Hip disease and many other diseases of the bones and joints are due to it; and in these and other ways it is the cause of a large proportion of the surgical operations in our hospitals.

In banishing the consumptive germ, therefore, these very serious diseases would be banished at the same time.

LIFE-HISTORY OF THE GERM.

When the germ succeeds in effecting a lodgment in the body either of two things may happen: First, it may establish and propagate itself by increasing in length, and then splitting into two, a process which, under favourable circumstances, leads to an extremely rapid increase, resulting in a correspondingly serious disease; or, second, if the part affected be in a vigorous and healthy condition, and the dose of infection be not a very large or a very virulent one, the chances are that the germ will fail to overcome the resistance of the protective cells always present in the human body, and will be very quickly killed.*

Even when the germ has established itself in the tissues

* The results of *post-mortem* examinations show that this fortunate event very frequently happens, and that there are in fact but few past middle age in whose system the tubercle germ has not at some time effected such a lodgment. This shows how vitally interested everyone is in diminishing the general liability to infection, for it is impossible to tell whether any particular person will be among those who succeed in resisting the infection or not. Not only is there the unknown factor of the natural and inherited power of resistance to tubercular infection, but he who, when in vigorous health, has successfully resisted it may succumb when run down. Moreover it has been fully established, not only that a large dose is far more effective than a small one, but that there are very different degrees of vigour in the bacilli. Animals infected with tubercle taken from the lungs of one who has died from a very severe and rapid attack of consumption show correspondingly severe and rapid symptoms, while those similarly infected from mild cases show correspondingly mild symptoms.

it sometimes happens that the protective cells form a wall enclosing the invading germs, so as to prevent their spreading. There may then be no evidence that anything is wrong except perhaps a general lowering of vitality, more or less pronounced. It is impossible to tell how long this quiescent condition may remain, and the final result may be either that the tubercle germs die and so much of the tissue becomes solidified, or that after a time the protective tissue gives way, the germs get free again, and the disease spreads as they multiply.

When the germs continue to multiply within the body, a time comes when the system must expel them, and thus the infection is spread. That is done in different ways. Sometimes a sore opens, and the bacilli are discharged with the pus. But the phlegm coughed up by the consumptive is by far the most important agent in spreading the infecting germs.

So long as the bacilli thus discharged remain surrounded by *wet* masses of phlegm or pus they are not very likely to get into the body of a healthy person whose skin is unbroken. But it is quite different with the minute droplets which are expelled as a very fine spray when a consumptive person coughs. Careful experiments have shown that, if the air is still, such droplets may remain floating about in it for half an hour or more after the cough—just as the very minute drops of water which form a fog remain suspended in the air for a long time, while the larger drops, which we call rain, fall at once. If this invisible tuberculous spray is not quickly dispersed by fresh air entering the room, it may be breathed back into the lungs of the patient, and the germs in it may, perhaps, repeat their previous history, even infecting a different part of the lung, and thus greatly adding to the intensity of the attack; or if it be breathed in a concentrated form by a healthy person, it may infect and ultimately kill him, especially if his lungs be delicate or irritated by dust, as is the case with many factory operatives.

This is one reason of the immense importance of having the freest possible ventilation around a consumptive patient, both for his own sake and that of those who attend on him. Plenty of fresh air not only lessens greatly the chance of infection by mere dilution of the infection—*i.e.*, by reducing

the number of germs entering the lungs with each inhalation, but it also helps to diminish the vitality of, and ultimately to kill, the germs themselves, and, in addition, it effects a distinctly curative effect on the lungs themselves.

As to the bacilli which do not float in the air, but are surrounded by masses of phlegm or of pus, they may ultimately get back into the body by a different process, if they are not destroyed by burning or effective disinfection before they have time to dry. For after the material in which they are enclosed has dried, it will in time get powdery, and then it will become part and parcel of the surrounding dust. When this tuberculous dust is stirred up it may get into the body by being breathed into the lungs, or being swallowed with the food, or, perhaps, through the skin, especially if it be broken, and then a similar round of changes goes on.^a The lighter the dust, and the more easily it floats in the air, the more likely it is that the tubercle germs, which stick to the particles of dust, will be breathed into the lungs. Thus the danger from the light dust of infected linen or calico, such as pocket-handkerchiefs, pillow covers and sheets, is proportionately much greater than that from the heavier dust of floors.

As to the life of the germ in this tuberculous dust, it depends upon whether the conditions are sanitary or unsanitary. If it be freely exposed to fresh air and sunlight it dies in two or three days or less; but if allowed to remain in dark and badly-aired places, it lives on in a passive condition for long periods, ready to grow again when by any chance it again gets into the body.

Such is the history of the tubercular germ where the human body alone is concerned. Cattle and other domestic animals also suffer from tuberculous diseases, and there is a strongly-held opinion that man may get the disease from germs which have grown in diseased cattle. Especially it is believed that the milk from tuberculous cows is a very common cause of consumption of the bowels in children—a most serious and fatal disease. Although this opinion has been called in

^a It ought to be stated that the mere *air* breathed out—not coughed out—by a consumptive does not contain tubercle germs, but any expiration, and especially a forcible one, may contain minute droplets of water with tubercle germs in them.

question, and cannot be considered as finally established, yet it would be very undesirable to relax the precautions dependent on it, so long as there is a probability of its truth.*

CONSUMPTION, THOUGH IT USUALLY "RUNS IN FAMILIES," IS
HARDLY EVER HEREDITARY.

It is now generally recognised that the number of cases in which the tubercle germ makes its way from the parent to the offspring before birth is so small as to be insignificant compared with those infected from external sources. It is nevertheless true that the children of consumptive parents are far more often consumptive, or afflicted with other tuberculous diseases, than the children of healthy parents; for, unless very strict precautions are observed, they are exposed to more frequent and more concentrated doses of infection than those whose near relatives are not consumptive. If they were guarded from infection they would not become tuberculous.

Statistics in German orphan houses have shown that the infant children of parents who have died of consumption grow up without more liability to the disease than other children. Yet when one sees member after member of a family struck down by tuberculous disease it seems hard, at first sight, to accept the medical conviction that the disease is not hereditary. A few examples taken from the exhaustive Report of the Edinburgh Public Health Committee are more convincing than any mere theorising:—

In 1896 a young lady of twenty-six fell ill of consumptive blood-spitting. The father had died of consumption in 1879; the mother of tuberculous inflammation of the brain in 1882; two adult sisters had died of consumption in 1882 and 1884; the third sister, and four of the five brothers, fell ill of consumption, with blood-spitting, in the years 1883, 1885, 1889, and 1890. Except two children, who had died in infancy of other diseases, and one son who escaped, the parents and all the offspring were thus tuberculous. Some years ago anyone would have said that this was a case either of inherited consumption or of conspicuous inherited predisposition. But, when examined, it is found that up to 1870, when the father became infected, no member of the family had ever shown symptoms of tubercle. The grandparents on both sides were healthy; the father had four brothers and two sisters, who had between them twenty-eight children; the mother

*It is, however, probable that some of the money now expended when diseased cattle are condemned might be more profitably spent in other modes of combating tuberculosis.

had four sisters, with twenty-four children. *None of these relatives ever contracted tubercle disease.* When to that fact it is added that the son who did not get the disease left home in 1880, one year after the father's death, it becomes clear that the case was one of the infection of a healthy family, living together continuously as they did in one house, due to the bacilli originally generated in the father's system, he having been infected from some unknown source.

The history of a particular dwelling in a large Artisans' Dwellings Building was traced, because it seemed a nest of consumption. From 1865, when it was built, to 1874 it was inhabited by three families, all healthy. In 1874 a family, in which the mother was already consumptive, entered it. The woman died in the house, and after a year's tenancy the family left. The next occupants were a family of seven persons, all healthy. They left after a year's occupation, and at a subsequent date it was found that the father, mother, and one son died of consumption of the lungs, and a fine boy of consumption of the bowels. The next family were healthy on arrival. A child born in the house died of tuberculous inflammation of the brain; later the father died of consumption, and another child of brain inflammation, another contracted hip disease, a sister became extremely scrofulous, and the mother became consumptive. A fourth family came in after this, all healthy; the mother became consumptive, and two children died of tubercular inflammation of the brain.

During all this period the dwelling in question was never vacant; each new tenant entered while it was still warm from the previous one, and it was never painted or cleaned out. It is stated in the same large house that there were many other dwellings in which this neglect did not occur, and that there was no other similar instance of tubercular disease clinging to the apartments.

Koch and numerous other German observers have shown that the offspring of animals infected by tubercle develop as vigorously as those of healthy animals if they are shielded from infection.

Bernheim made a few very interesting observations. Here is one:—Three consumptive mothers gave birth to twins; in each case one twin was nursed in the parental house by a healthy wet nurse, and one sent elsewhere. The three twins kept at home caught the infection and died, as did also two of the healthy wet nurses. The three twins who were separated from their mothers and put in healthy surroundings developed vigorously, and remained free from tuberculosis.

SOME WAYS IN WHICH THE INFECTION IS SPREAD.

The examples just given indicate one of the most serious sources of danger—one which, though it affects the poorer classes more than others, is by no means confined to them. Cases of fatal infection are known to have occurred from occupying infected rooms in lodgings where the visitor has gone in search of health. Until the sanitary authority has powers of compulsory disinfection of such premises, or until

an effective public opinion brings sufficient pressure to bear, this terrible condition of things will constantly recur.

Another very serious danger to which the poor are exposed is that arising from the purchase, at second hand, of the furniture or clothes of a consumptive who has never known, or cared to take, any precautions. At present there is no restriction on this sale of deadly poisons. The unfortunate couple who, setting up for themselves, cannot afford to buy new furniture, must buy it in a lottery where the forfeit is a deadly disease to themselves and their children. The State, though it frames elaborate laws to regulate the sale of poisonous drugs, permits without interference this constant sale of a far more devastating organic poison. This sale will continue until either public opinion represses it—probably a distant contingency—or until the sanitary authority is in a position to exercise compulsory powers of disinfection.

The life-history of the germ shows us how the infection must be spread ; but consumption being a slow, chronic disease, with no fixed period of incubation, one cannot usually fix the date and occasion of the infection in any particular case. Indeed, in most cases of serious disease, it is probably a kind of cumulative infection—a little added from time to time until the protective action of the cells is overcome. There are, however, a number of cases on record in which the evidence seems clear enough.

A robust man of 40 inhaled a dose of tuberculous spray intended for experiments on dogs. He died from acute consumption 14 weeks afterwards. There have been other cases of artificial infection of bacteriological experimenters.

Accidental inoculation of the skin has occurred in different ways—in *post-mortem* examinations of men and animals, by the prick of a morphin syringe, by a scratch from a broken glass spittoon used by a consumptive. In most of the cases it has remained localised, and in some of them it has been cured by timely excision of the affected parts. Similar cases have occurred where a consumptive has sucked an incised wound to stop the bleeding.

The infection in regard to 10 infants attended by her was traced to a midwife far gone in consumption, whose improper habit it was to blow down the lungs of newly born infants.

The infection is, however, known to be usually due to the tuberculous dust which comes from the sputum left about by careless consumptives, or to the fine tuberculous spray which they emit when coughing. As a full supply of air necessarily scatters the germs, even if it should not have time to kill them, it is in confined or close and covered places that the infection of a healthy person by a consumptive is most likely to occur, either by breathing in the germs or swallowing them. The schoolboy, for instance, who drops his apple on the floor of a railway carriage and eats it after merely brushing off the visible dust, may some day swallow a dose of tuberculous poison and develop consumption of the bowels or of some other part.

THE PREVENTION OF TUBERCULOSIS.

The principles lie in a nutshell. The tubercle germ does not multiply outside the body (except, of course, under the very special circumstances in which bacteriologists can cultivate it), nor does it usually retain its vitality very long when expelled from the body. Every case, therefore, of human infection is a case of one human being getting into his or her body a number of bacilli which, not very long before, had been in the body of someone else, who had not taken proper precautions to prevent their infecting other people after he had himself expelled them from his own body.^a

If, therefore, consumptive persons always coughed into something which caught the germs given off, and if all the infected material were burned or disinfected before it dried and got scattered abroad as dust, and if those having tuberculous sores took similar precautions as to the discharge from them, there would be no fresh germs scattered about to infect other people, or, indeed, to add to the intensity of the patient's own symptoms. If, in addition, all the dirty and ill-aired places which now contain germs on the wall-paper and the floor, in the dust of and sticking to the drapery of the furniture and bedding, were to be disinfected, the existing sources of infection would be destroyed. If great care were exercised

^a This does not, of course, refer to bovine infection. But those who consider it as an effective cause rank it far below human infection in regard to the number of cases to which it gives rise.

in both ways, consumption would soon become almost as rare as leprosy.

The practical rules for carrying out the necessary precautions are given in the pamphlets of the Dublin Branch of the National Association for the Prevention of Tuberculosis, and in other leaflets dealing with the matter, and there is, or ought to be, a poster with directions hanging up in every dispensary in Ireland.^a

The address of the Dublin Branch of the Association is The Royal College of Physicians, Kildare-street, and a request to the Secretary will secure a prompt supply of pamphlets or leaflets with directions. It may be mentioned here that the small pamphlet "*Consumption and its Prevention*," originally written for managers and teachers of National Schools, is far the most complete and careful of the pamphlets now issued by the Association in Dublin.

Reference ought also to be made to a remarkable and excellent little work on consumption, written specially for Roman Catholics, by Father Martin Healy, of Ballinrobe, and published by the Catholic Truth Society, price 1d.

AUXILIARY MEANS OF PREVENTION.

Accepting, however, the fact that we are still a long way from the time when consumptive persons and their attendants

^a What has been said about the life-history of the germ may suggest some additional precautions. For instance, bearing in mind the tuberculous spray in coughing, and the dangerous character of the light dust from linen or calico, it is evident that, even where a spittoon is used, a good deal of tuberculous dust must rise from the pillow case and upper sheet, and that the shaking of them in making the bed is a matter requiring care. To reduce this danger as far as possible a removable slip of linen might be pinned over the pillow and carefully removed each morning (or for bed-ridden patients twice a day), disinfected by boiling, and put on again in its turn. As it is impossible to completely prevent tuberculous dust from rising, safety is to be sought in diluting it as far as possible with fresh air.

There is a point not always made clear in the printed directions—viz., that in disinfecting by boiling, it is not sufficient to dip the articles into boiling water. That may be better than nothing; but disinfection is not to be considered complete unless they have been boiled for from 15 to 20 minutes. It may be added that for fabrics and vessels this is the safest of all methods of disinfection in all cases of infectious diseases. Boiling from 15 to 20 minutes kills all harmful germs. When articles which may be infected with tubercular discharges are sent to the wash, they should be boiled *before* washing, otherwise the washerwoman may become infected, especially if her skin be cut or broken. Such cases have been traced.

will fully carry out those precautions which alone can prevent their being a fatal source of danger to others, there remains the other field of prevention which has been so successful in England. It has been stated that the life of the germ when expelled from the body is long in unsanitary, but short in sanitary, surroundings. Hence, even with the same number of infective germs scattered about by tuberculous people, the chance of infection is diminished as the sanitation is improved. But in addition to this numerical consequence, the resistance to infection of a person living under conditions generally healthful is far greater than that of a person living in unsanitary surroundings.

Plenty of fresh air, sunlight, wholesome (not necessarily expensive) food, and temperance in regard to alcohol—these are the conditions of life which render a person unlikely to succumb to infection of any kind, and especially to the infection of consumption. And, although no amount of overcrowding or other unsanitary conditions can create consumption, any more than they can create leprosy, yet, so long as there is any tuberculous matter about, it will find a ready prey in those who are subject to unsanitary conditions in general. There are also special trades in which the liability to consumption is very great, as those where the chemical or mechanical properties of the dust given off are injurious to the lungs, or where the stooping position is unhealthy for the chest. In these cases especial care ought to be taken to prevent tuberculous dust in the factories or workshops.

When children are growing up, all measures which tend to improve the general health and to turn them out strong men and women are most valuable in lessening the risk of subsequent tubercular disease. In especial the habit of sleeping with the window open, and those exercises which tend to develop the chest, are effective in preventing consumption. On the other hand, children who are accustomed to breathe vitiated air, and whose chests are contracted by constant sitting in cramped positions, are likely to offer but small resistance to the infection.

THE MEASURES ADVOCATED ARE REALLY EFFECTIVE.

In England the auxiliary method of general sanitation

proved wonderfully effective, reducing the annual consumptive death-rate from 38 per 10,000 in 1840 to 19 in 1880, and it is now about 13 per 10,000. It is to Germany, however, that we must look for the best evidence of the success of the modern methods, because it is in Germany that they have had the best trial, owing to the high average of education and the readiness of the people to adopt official regulations, aided, perhaps, by a national pride in German discoveries. Between 1882 and 1900 the annual death-rate per 10,000 from all the tuberculous diseases fell from 31 to 21 in Prussia, as against a fall from 24 to 19 in England in the same period.

The German Army, however, supplies the best example, on a large scale, of what may be done. From 1884 the German Army surgeons and authorities took full advantage of the bacteriological discoveries of Koch and others, and the tubercular death-rate per 10,000 fell from 6·3 in 1884 to 2·3 in 1897.

The German insurance companies have just begun to start sanatoria for the cure of consumptives as a financial speculation. They consider that to catch a man as soon as possible after consumption has declared itself, and spend money, in curing him, is cheaper than to pay the lump sum insured on his premature death.

THE HOME CURE OF CONSUMPTION.

Until the bacteriologists succeed in discovering an anti-tubercular serum, the case of the consumptive who cannot go to a sanatorium for treatment will be regarded by many as almost hopeless, for no known drugs will cure him. Yet, as has been pointed out, an appreciable number of consumptive persons have become cured of themselves, even without any treatment at all. In these cases we may be assured that the sufferers led healthy out-of-door lives. There is indeed hope for the consumptive who will resolutely and in all weathers keep his window open day and night,^a especially if he can get plenty of wholesome food, with, perhaps, cod-liver oil and any tonics or other treatment which may be prescribed by the

^a The present treatment in the Newcastle Sanatoria Hospital for Consumption, and in many if not all others, includes putting the patient's bed in the draught between the window and the door, and keeping both open regardless of weather.

doctor. If this method be adopted in the early stages of the disease, the prospects of recovery are very encouraging.

But if the treatment be not undertaken until a late stage of the disease, the home cure becomes difficult, and in practice almost hopeless, while even in the best sanatorium the probability of recovery is but small. It is therefore of the greatest importance that in every case of a persistent cold and cough the medical attendant should be consulted as early as possible, and a sample of the sputum sent for bacteriological examination, so that if the case be one of incipient consumption, appropriate treatment may be given at once. This is the more imperative, because the common idea of the treatment for a cough is to stop the ventilation, so as to "keep out the draught," and this is the worst possible treatment for the consumptive, and the most dangerous possible for those with him.

But in consumption, not only is prevention better than cure—it is far simpler, far easier, and far more likely to be successful.

THE CONDITION OF IRELAND.

It is with a feeling of sorrow and shame that one turns from the encouraging progress of England and Germany to the unhappy retrogression of our own country. In Ireland, alone among western countries, the tuberculous death-rate has been steadily rising. In the decade, 1870 to 1880, the average death-rate per 10,000 was 26 ; in 1880–90, 27 ; and in 1890–1900, 28, which is its present figure (1903). No doubt, some portion of this may be accounted for by the fact that emigration deprives us of a number of the most vigorous adults, but in the case of consumption this argument applies least of all, for it is precisely among the young of adult years that consumption is most rife. Half the total deaths in all Ireland of those between 15 and 35 years of age are caused by consumption, and much more than half by all the tuberculous diseases together. Half of all the deaths between 15 and 45 are caused by the tuberculous diseases. Thus the death-rate is no guide at all to the misery due to our neglect of precautions against this terrible disease. For it is the adult, the wage-earner, the man who has incurred the responsi-

bilities of life, the man to whom a family looks for support, or the mother on whose care the welfare of young children depends, who are its most frequent victims. These are taken, and those dependent on them are too often left without the means of support.

WHAT PRACTICAL MEASURES CAN BE TAKEN ?

The first thing is to create, especially among the poorer classes, a healthy public opinion.^a The experts may know how thousands of lives may be saved, but it is useless to hope that the sick will adopt any precautions much in advance of what the public opinion of their neighbours approves or demands.

The general Public Health Acts, although not specially directed towards consumption, confer on the Local Authorities all over the Kingdom very useful powers, which they seldom exercise. If the value of these powers were appreciated by the people—if the Public Health Authority were looked on as a beneficent agency, whose assistance was to be welcomed, and if, on the other hand, that authority took the full advantage of its opportunities—the result would be of incalculable benefit to the consumptive, to those living with him, and to the community generally. But we are very far from this happy state. Even in the suburbs of Dublin some of the Local Authorities have as yet (1903) failed to make the very necessary provision of free disinfection—necessary, because it is almost impossible for the poor to carry it out for themselves, while even the well-to-do are often just as helpless. And, on the other hand, even where free disinfection is provided, as in Dublin City, the poorer people are so ignorant of its efficiency, or so much afraid of the trouble it involves and of the effect on their neighbours, that they generally

^a Even educated British public opinion has been strangely backward. Upwards of twenty years has elapsed since Koch's discovery, yet Parliament has taken no steps whatever to secure that it should be utilised, although the preventable loss of life in each year in Great Britain and Ireland far exceeds that of the whole three years of the South African war. It is, too, a striking contrast, that while great efforts are rightly being made to discover the cause and the means of prevention of cancer, and, if possible, to find a cure for it, the knowledge ready to hand in regard to the far more devastating disease of consumption is still, to a large extent, unutilised.

refuse it, even when offered.^a They will attend wakes, sleep, dwell, or visit, in places teeming with infection, without a moment's misgiving, but as soon as ever the officer has been to disinfect a house or room, they shun it as if he had brought the plague instead of banishing it. Consequently, there are many, even among the more intelligent, who will keep the thing quiet, and run all risks, rather than have the place openly disinfected and be then shunned by their neighbours.

In regard to such matters as these, ministers of religion, district visitors, employers of labour, and many others, can do much to impress on those with whom they are brought in contact the two points of paramount importance—

1st. The necessity that the consumptive and those connected with him shall take sensible precautions.

2nd. The foolishness of being afraid of the disease after the proper precautions have been taken.^b

And, on the other hand, it is equally necessary to bring pressure to bear on the Representatives on the County Councils to provide measures of free disinfection in a form which will be at once effective and acceptable to the people. If the articles disinfected are injured or seriously decreased in value the poor will not co-operate with the sanitary authority.

The County Councils also possess other powers of a very wide character. They can, for instance, make spitting in public places a punishable offence, a power which the County Council of Glamorganshire has already exercised in regard to *covered* places. Such regulations are of the greatest value if the public generally assist in seeing that they are carried out. They are worse than useless if public opinion will not tolerate their enforcement.

They also have power to establish, as a charge on the rates, sanatoria for the reception of consumptive patients, at all events in cases where the patients are a danger to the public health.

^aIn Dublin when a certificate of a death from consumption reaches the Registrar-General of Deaths, he sends a notice to the Public Health Department, which sends an officer to explain the advantages of disinfection, and to offer to do it without charge. It is stated (1902) that in three-fourths of these cases the offer is refused.

The nurses in a consumptive hospital hardly ever get consumption because proper precautions are taken.

They could also, under their present powers, undertake, free of charge, the bacteriological examination of patients' sputum when sent to them by the medical attendant. This is certainly a power which they ought to exercise, and it might be so utilised as to form the basis of a system of voluntary notification if compulsory notification be not adopted. The doctor, when sending the sputum for examination, might either request the Public Health Authority to send their official to explain and assist in the necessary measures of precaution, if the case turned out to be one of consumption, or he might say that he preferred to be himself responsible for seeing that those measures were carried out.

No expenditure of public money is so necessary as this—a small amount would establish and maintain a bacteriological laboratory, and the benefit would be immense and immediate. Not even in the City of Dublin has such a laboratory been provided by the Public Health Authority (1903).

No disease can be efficiently dealt with unless the Public Health Authority can intervene to see that proper precautions are taken when the medical attendant is not himself prepared to undertake that responsibility. This it can do only if it is informed of the cases of disease as they occur. Hence, either there must be an effective public opinion in favour of seeking the assistance of that authority, or else there must be a system of compulsory notification. The present law respecting notification was enacted solely with a view to acute infectious fevers, such as smallpox or scarlatina. If consumption were made a notifiable disease, some hold that every consumptive would be liable to severe penalties if he appeared in public, and wage-earning would be stopped if the powers were enforced. Thus, were the Act in full operation, provision would have to be made for the forty thousand tuberculous people in Ireland and those dependent on them, which is at present out of the question. It is urged, however, that the powers might nevertheless be entrusted to the Public Health Authority, in the assurance that they would not be unreasonably used. But the Local Government Board has so far steadily refused to allow consumption to be made a notifiable disease under the present Act.

There are, however, wide differences of opinion, not only as to the advisableness of putting the present Act into operation,

but even as to any system of compulsory notification, and it is not consistent with the object of this paper to take sides on any question where well-informed opinion is still undecided. But there can hardly be any difference of opinion as to the necessity of giving the Public Health Authority powers of compulsory disinfection where its assistance is invoked by anyone interested. And it is clear that if no system of compulsory notification be adopted, it is all the more necessary that a strong public opinion shall be brought to bear, so that the medical attendant shall have the full sanction and approval of the public in using all his influence to insist on proper measures of precaution and of disinfection.

Whatever differences there may be as to the most suitable administrative measures, there is no doubt of the great interest recently awakened throughout the country, or that the prospect of educating the people on the matter is now more hopeful than ever. The National Board of Education is assisting by directing the attention of all the National School teachers to the matter, and in many ways public attention is being directed to this, the most important of all sanitary reforms.

Economy, self-preservation, and Christian sympathy, all supply the most imperative reasons for reform—reform which has been delayed far too long already, and must be further delayed in proportion as individual effort does not assist.

Economy—because in Ireland alone upwards of 12,000 people die annually of tuberculosis, most of them in the early prime of life. Assuming that on an average each of these is worth only 5s. a week to the community, and would live for ten years longer if there were no tubercular germ in Ireland, then each death is a loss of over £130, and the total loss is 12,000 times this, or £1,560,000 a year.

Self-preservation—because the chance of dying between 25 and 35 (not to speak of other ages) would be almost halved if the consumptive germ were banished from Ireland.

Christian sympathy—because we ought not to be callous to the misery and sorrow which must each year accompany the deaths of 12,000 people, for the most part with others dependent on them or looking to them for assistance in the near future, especially when each death usually means a sad, long, and hopeless illness, too often involving other members of the family in the same unhappy fate.