The Current State of the Struggle against Tuberculosis

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Twenty years ago, tuberculosis, even in its most dangerous form, consumption, was still not considered infectious. Of course, the work of Villemin and the experimental investigations by Cohnheim and Salomonsen had already provided certain clues which suggested that this conception was false. But it was only with the discovery of the tubercle bacillus that the aetiology of tuberculosis was placed on a firm footing, and the conviction gained that this is a parasitic disease, i.e. an infectious, but also avoidable one.

In the first papers concerning the aetiology of tuberculosis I have already indicated the dangers arising from the spread of the bacilli-containing excretions of consumptives, and have urged moreover that prophylactic measures should be taken against the contagious disease. But my words have been un-heeded. It was still too early, and because of this they still could not meet with full understanding. It shared the fate of so many similar cases in medicine, where a long time has also been necessary before old prejudices were overcome and the new facts were acknowledged to be correct by the physicians.

However, quite gradually the understanding of the infectious nature of tuberculosis then spread, taking root ever more deeply, and the more the conviction of the dangerous nature of tuberculosis made headway, the more was the necessity of protecting oneself against it thrust on people.

First of all, efforts directed to this end attracted attention in papers giving information and warnings. Shortly after this there came into existence, provoked by the successes which Brehmer obtained with the dietetic-hygienic treatment of patients with lung complaints, sanatoria for consumptives, to which were added convalescent homes, seaside resorts, out-patient clinics and similar establishments. An extremely rich corporate activity developed. International congresses took place. In some places the obligation to give notice to the authorities was introduced, on an optional or compulsory basis. In some states and cities thoroughly worked-out laws were enacted against the tuberculosis menace. Hardly a country remains where, in one way or another, the struggle against tuberculosis has not been taken up, and it is extraordinarily gratifying to see how the campaign is now waged quite generally and with considerable vigour against this dangerous enemy.

But taken as a whole, all these efforts were quite dissimilar in character, though they all pursued the same aim, but chose quite different approaches to it. In one country people wanted to achieve everything by instruction, in another they hoped to be able to remove tuberculosis by therapeutic measures, and again in another people turned exclusively against the supposed menacing dangers of bovine tuberculosis. Of late a certain adjustment has, indeed, made its appearance, in so far as individual countries no longer proceed in quite such a biased way as before, and one takes over from another whatever seems to be well tried in the way of means of defense. However, amidst the persistently great variety in the ways and means of combating tuberculosis, it is yet necessary to ask what measures do indeed best satisfy the scientific requirements and general findings in the fight against contagious disease.
But, before we come to answer this question, we must make perfectly clear to ourselves how infection is brought about in tuberculosis, i.e. how the tubercle bacilli invade the human organism; for all prophylactic measures against an infectious disease can only be directed towards preventing the germs of disease from invading the body.

In relation to tuberculosis infection so far only two possibilities have offered themselves: first, infection by tubercle bacilli which come from tuberculous people, and second, by those that are contained in the milk and meat of tuberculous cattle.

As a result of investigations which I made together with Schütz into the relation between human and bovine tuberculosis, we can dismiss this second possibility, or look upon it as being so small that this source of infection is quite overshadowed by the other. We arrived in effect at the conclusion that human and bovine tuberculosis are different from one another, and that bovine tuberculosis cannot be transmitted to a human. With regard to this latter point, I would, however, like to add, so as to obviate misunderstandings, that I refer only to those forms of tuberculosis which are of some account in the fight against tuberculosis as an epidemic, namely to generalized tuberculosis, and, above all, to consumption. It would take us too far here, if I were to go more closely into the very lively discussion which has developed over this question; I must keep this for some other occasion. I would just like to observe in addition to this that the re-examination of our investigations, which was undertaken in the Imperial Department of Health in Berlin with the greatest care and over a wide area, has led to a confirmation of my view, and that the harmlessness for humans of the bacilli of "pearl disease" is directly proved, in addition, by inoculating humans with material from it, as was done by Spengler and Klemperer. Consequently, only the tubercle bacilli coming from humans are of consequence in the battle against tuberculosis.

But the disease does not in all tuberculous patients take such forms that tubercle bacilli are discharged to a noteworthy extent. It is really only those suffering from tuberculosis of the larynx and lungs who produce and disseminate considerable quantities of tubercle bacilli in a dangerous way. But it is as well to note that not only is the secretion of the lung called sputum dangerous by reason of its bacillary content, but that, according to the investigations of Flügge, even the smallest drops of mucus expelled into the air by the patient when he coughs, clears his throat, and even speaks, contain bacilli and can cause infection.

We come therefore to this fairly sharp demarcation, that only those tuberculous patients comprise an important danger to the people around them, who suffer from laryngeal or pulmonary tuberculosis and have sputum which contains bacilli. This type of tuberculosis is designated "open" as opposed to "closed", in which no tubercle bacilli are discharged into the environment.

But even in patients with open tuberculosis there are still distinctions to be made regarding the degree of danger due to them.

It can indeed very often be observed that such patients live for years with their families, without infecting any of them. Under some circumstances, in hospitals for consumptives infections among the nursing staff can be totally absent, or indeed so rare that it was even thought that in this was to be seen a proof of the non-contagiousness of tuberculosis. If, however, such cases are looked into more thoroughly, then it turns out that there are good reasons for the apparent lack of contagiousness. In such cases one is dealing with patients who are very careful where their sputum is concerned, who value the cleanliness of their home and their clothing, and in addition live in well-aired and well-lit rooms, so that the germs, taken up in air, can be rapidly carried away by the flow of air or killed by light. If these conditions are not fulfilled, then infection is not lacking in hospitals and the homes of the well-to-do, as experience teaches us every day. It becomes more frequent, the more unhygienically the patients handle their expectoration, the more there is a lack of
light and air, and the more closely the sick are crowded together with the healthy. The risk of infection becomes particularly high if healthy people have to sleep with the sick in the same rooms, and especially, as still unfortunately happens with the poorer section of the population, in one and the same bed.

In the eyes of careful observers, this sort of infection has acquired such importance that tuberculosis has been called plainly, and quite justly, a disease of accommodation.

To recapitulate briefly, the circumstances relating to infection in tuberculosis are as follows.

Patients with closed tuberculosis are to be regarded as quite harmless. Also people suffering from open tuberculosis are harmless as long as the tubercle bacilli discharged by them are prevented from causing infection by cleanliness, ventilation, etc. The patient only becomes dangerous, when he is on his own unclean, or when, as the result of advanced disease, he becomes so helpless that he can no longer see to the adequate disposal of the expectorated material. At the same time the risk of the healthy being infected increases with the impossibility of avoiding the immediate neighbourhood of the dangerous patient, thus in crowded rooms and most particularly when these are not only overfull, but are badly ventilated and inadequately illuminated as well.

I now come to the problem of examining the measures currently in use to see to what extent they take account of the aetiological factors, as I have just described them. If I prefer to confine myself in this to the conditions in Germany, this is because these are the ones I know best, and because it would not be possible to carry out a survey of the factors in other countries in a single lecture.

The starting-point in the fight against all contagious diseases is the obligation to report, because without this most cases of the disease remain unknown. So we must make this a requirement for tuberculosis as well. But in this particular disease, out of consideration towards the patients, there has been some reluctance to require the notification to be given by the doctors or those otherwise under an obligation to do so. However with the correct realization that it is not just a question of considerations applying to the sick here but also of the protection of the healthy, the obligation to notify has been introduced in several places, at first on an optional basis, and then, when it transpired that the disadvantages feared did not materialize, on a compulsory basis. Since, therefore, experience has already testified to the feasibility of registration in tuberculosis, it should be introduced everywhere. It can, however, without prejudicing the objective, be restricted to those cases which constitute a danger to their acquaintances and so to patients with open tuberculosis in hygienically unfavourable conditions.

If we lay the responsibility for notification on doctors, then we must at the same time ensure that they can judge the cases in question correctly, in particular with respect to the presence of open tuberculosis. This can only happen with the establishment of centres where the patient's sputum is examined without cost for tubercle bacilli. These could exist independently, or, what is perhaps more practical, in association with hospitals, polyclinics, or with social-welfare centres, which will be mentioned later. So far such places for investigations have already been established in some countries, but in far too small numbers. It will be necessary in future to take this need into consideration adequately.

Now what is to happen to the patients who are to be regarded as dangerous, after they have been identified?

If it would be possible to place all these people together in hospitals and thus make them relatively harmless, then tuberculosis would decrease very rapidly.
But this, for the moment at least, is out of the question. The number of people with tuberculosis for whom hospital treatment would be necessary is in Germany, for example, estimated at more than 200,000. To place so many patients in institutions would require enormous funds.

However, it is by no means necessary that all tuberculous patients should be brought into hospitals at once. We may count on a decrease in tuberculosis, albeit a slower one, if a considerable fraction of these patients are admitted into suitable institutions.

In connection with this, let me remind you of the exceptionally instructive example of the fight against leprosy in Norway. Not all lepers were isolated in that country either, but only a fraction of them, among which, however, were just those who were especially dangerous; in this way they have obtained the result that the number of lepers, which amounted to nearly 3,000 in 1856, has declined to about 500 at the present time.

One should proceed in the fight against tuberculosis along the lines suggested by this example. And, if it is not possible to deal with all consumptives, then as many as is humanly possible, including the most dangerous, i.e. those who are in the final stages of consumption, should be accommodated in hospitals.

In this respect, however, already there is more happening in some places than is usually supposed. In the city of Berlin over the last decade more than 40% of consumptives have died in hospitals. The circumstances must be fairly favourable in Stockholm as well, since Carlsson states in his paper on the fight against tuberculosis in Sweden that 410 consumptives were cared for in the hospitals in this city, which is no mean figure for a city of 300,000 inhabitants.

The number of consumptives who are brought in this way into a situation where they can no longer spread infection, is indeed fairly considerable and cannot remain without influence on the progress of this infectious disease.

In relation to this, I would like to draw your attention to a phenomenon which deserves the greatest consideration. This is the uniform and significant falling-off of the mortality due to consumption in several countries.

In England this decrease has already been under way for about 40 years. Significantly it is less in Scotland, and completely lacking in Ireland. The decline of tuberculosis in Prussia is very pronounced. During the decade 1876-1886 the mortality due to consumption still stood at a uniformly high level. Then from 1886 onwards, it fell from year to year, and has now dropped by more than 30%, i.e. by about a third. It has been calculated that, as a result of this, although the size of the population has risen in the meantime, each year about 20,000 fewer people will die of consumption in Prussia now than 20 years ago. In other countries, for example, Austria and Hungary, the mortality due to consumption has stayed at its former considerable level.

It is difficult to say what has brought about this characteristic behaviour of tuberculosis in the countries named. One supposes that several factors have worked together. The improvement in the situation of the lower strata of society, in particular with regard to housing conditions, and the improved knowledge of the risk of infection, which dissuades the individual from exposing himself unsuspectingly to infection any more, have certainly played their part in bringing about the decline in tuberculosis. But I am firmly convinced that the better provision for consumptives in the terminal stages, namely their accommodation in hospitals, which is happening to a relatively large extent in England and Prussia, has contributed most to the improvement in the tuberculosis situation. I am strengthened in this opinion particularly by the behaviour of tuberculosis in Stockholm, where, as has been mentioned already, proportionately many consumptives are cared for in institutions and where also the mortality due to consumption has decreased in the course of recent decades by 38%.
From this we must draw the lesson that the greatest emphasis must be placed on these measures in the fight against tuberculosis, namely on the accommodation of consumptives in suitable institutions, and much more care than before should be taken to insure that consumptives do not die in their homes, where they are moreover mostly in a helpless state, without adequate nursing.

When consumptives are no longer turned away, as before, by the hospitals as incurable, and when, on the contrary, we afford the best treatment conceivable and free of charge, and can even offer the prospect of a cure in a few cases, when in addition provision is made for their families during the illness, then there will be no need for any compulsion at all to make many more of these unfortunate sick people come to the hospitals, than is already happening now.

Now I am going to turn to the discussion of a measure which will combat tuberculosis in quite a different way. This is the matter of sanatoria. Sanatoria were established in the expectation that a great part, perhaps even the majority of consumptives can be cured in them. If this supposition were to be correct, then sanatoria would decidedly be one of the best weapons in the struggle against tuberculosis. But there is a good deal of argument as to the results of the sanatoria. By one side it is affirmed that they have had up to 70% of successful cures, while the other side disputes every success. Now it must be conceded that the 70% of successes does not refer to real cures, but only to the recovery of earning capacity. But from the standpoint of prophylaxis there is no gain in this, since a patient who is not completely cured but is only improved to the extent that he is capable of earning again for a while, later develops the condition of open tuberculosis, and succumbs to all its consequences, as were depicted earlier.

The reason for the relatively small number of real cures obtained in the sanatoria evidently lies in the fact that the duration of the treatment in these institutions is much too short, and that very many of the patients accepted are in such a far-advanced stage that the dietetic-hygienic treatment is no longer sufficient to cure them. Many doctors in sanatoria have also correctly recognized this already. For this reason they take care that only such patients are accepted as are in an early stage of tuberculosis, and in addition to the sanatorial treatment they administer tuberculin preparations, in order to achieve swifter, and, in particular, more lasting cures. In this way considerably better results than before have already been obtained in several sanatoria, and it is to be supposed that sanatoria, if they go on in this way, will make quite a substantial contribution to the fight against tuberculosis, at least in Germany, where already about 30,000 patients are now getting treatment each year in over a 100 sanatoria.

If in this way the greatest possible proportion of consumptives in an advanced state are taken care of by admission into the hospitals, and if the earliest stages of the disease are taken care of by the sanatoria, then there is still a large number of patients left, who must at all events be taken into account too. These are the ones in advanced stages of the disease who remain at home, and those consumptives whose illness has progressed too far for treatment in the sanatoria, but yet still not so far that they are incapable of working and have to go to a hospital. If these tuberculous people, whose numbers, as I have said, are truly considerable, are abandoned to their fate, then a great gap in the battle against tuberculosis would result from this.

To have filled in this gap is the merit of Calmette, who had the happy idea of taking care of this category of patient with the out-patient clinics which he had organized. This stimulus provided by Calmette has met with approval everywhere, especially in Germany, where over 50 such establishments have been set up, and many towns are on the point of providing themselves with them too. It was in Germany also that the out-patient clinics, which were originally only intended to provide the working-classes with free advice, medical treatment, and material support as well, were substantially broadened in scope and completed under the guidance of Pütter and Kayserling. In their present form they are intended not only to serve a particular class, but to serve all helpless
sufferers from tuberculosis in every way. The sick person is visited in his home, and he and his relations are given instruction and advice concerning cleanliness and how to deal with expectorations. If living conditions are bad, then money is granted in order to make it possible to arrange the separation of the sick person from the healthy relatives in his house either by renting a suitable room or by supplying different, more adequate accommodation, and in this way to make the dangerous patient relatively harmless. In addition poor families are supported by granting them appropriate food, fuel, etc. The institute itself does not take over the treatment of the sick, so as not to come into conflict with the medical practitioners; but it sees to it that they come under medical treatment, and, where appropriate, that they gain admission to a hospital, sanatorium or convalescent home. But a particularly important aspect of their work consists in watching over the relatives, in particular the children, and in investigating from time to time to see whether infection has resulted, so as to be able to bring help as early as possible.

In such ways these institutes provide the poor consumptives with a true welfare service, and on this account, with full justification, they have been called "social welfare centers". I consider these arrangements to be one of the most powerful weapons, if not the most powerful, which we can bring into use against tuberculosis, and I believe that the social welfare centres, if, as is to be hoped, they spread over the country in a close network, are destined to exercise an extremely beneficial effect.

The measures which have been mentioned so far, namely duty to registrate, hospitals, sanatoria, and social welfare centres, comprise the heavy artillery in the fight against tuberculosis. But besides these, other lighter weapons are available to us, which can not produce any such decisive effect on their own, but whose aid we cannot dispense with.

Among these I mention in the first place all the efforts which have been directed at instructing the people on the danger of tuberculosis by means of popular publications, lectures, exhibitions and other media of that kind, and at keeping alive the interest of all social classes in the fight against tuberculosis. Later, when the social welfare centres are available in sufficient numbers, instruction will be dispensed on such a generous scale from these institutes, that we will hardly need special arrangements for this any more then; but for the present we cannot dispense with them.

In addition the numerous societies and associations provide very valuable help, which participate in the fight against tuberculosis by supplying money with which to found sanatoria and convalescent homes, to endow free beds, and to support the families of poor consumptives, etc.

We should not close our eyes to the fact that the fight against tuberculosis needs quite considerable financial resources. Basically it is only a question of money. The more free beds for consumptives that are endowed in well-equipped and well-run sanatoria and nursing-homes, the more adequately the families of the tuberculous are supported, so that the sick are not dissuaded from going into hospital out of concern for their relatives, and the more social welfare centres are set up, the more rapidly will tuberculosis decrease in importance as a wide-spread infectious disease.

Since, however, it is hardly to be expected that communities, which have already now often made generous sacrifices on behalf of their tuberculous members, will be able to meet all the requirements in this respect in the immediate future, it follows that help coming from private quarters is much to be desired. But care must be taken that the funds raised by societies and associations, or made available by individual benefactors, do not find employment on matters of secondary importance, but that they should be used to further the most effective measures, above all the institutes for the accommodation of the sick and the social welfare centres.

In the fight against tuberculosis, as it has been depicted so far, hardly anything remains to be done by the State, and yet, for its part, it can contribute to it in an effective way. This can happen by the
State introducing legislation for compulsory registration for tuberculosis, which already is in force for all the other important wide-spread infectious diseases. In several countries this has already happened, and it is to be hoped that the other civilized countries will soon follow this example. Often a legislative foundation as well has been required for the compulsory isolation of such sick people, who are particularly dangerous to those surrounding them. According to my experience in the fight against contagious diseases we can, however, dispense with these stem measures. If we only make the admission of consumptives into suitable hospitals easier in the way indicated earlier, then we will achieve all we need.

But the State can interfere particularly usefully in one respect, namely as regards the improvement of unfavourable housing conditions. Private action is virtually powerless against this nuisance, while the State can easily remedy the situation with suitable laws.

If we look back on what has happened in recent years in the fight against tuberculosis as wide-spread infectious disease, then we cannot help but gain the impression that quite an important beginning has been made.

The struggle against tuberculosis is not dictated from above, and has not always developed in harmony with the rules of science, but it has originated in the people itself, which has finally correctly recognized its mortal enemy. It surges forward with elemental power, sometimes in a rather wild and disorganized fashion, but gradually more and more finding the right paths.

The struggle has caught hold along the whole line and enthusiasm for the lofty aim runs so high that a slackening is no longer to be feared.

If the work goes on in this powerful way, then the victory must be won.

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