TUBERCULIN TREATMENT AS THE ESSENTIAL METHOD OF DISPENSING SANATORIUM BENEFIT.

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IN the first of a series of articles appearing in the *Deutsche medizinische Wochenschrift* in memory of Professor Koch, Professor Loeffler ends with these words:

By the establishment of tuberculin dispensaries such as Wilkinson has introduced, the last, and for the poorest sections of the population the most important, unit would be incorporated with the splendid organizations for fighting tuberculosis, and thus the gigantic problem of eradicating consumption as a disease of the masses would approach nearer its final solution.

The problem of dealing in the best way with a disease which counts its victims by hundreds of thousands in the British Isles may well appal those who have to advise upon a sound means of defence and attack. A generous Parliament has placed 2½ millions at the disposal of the Insurance Commissioners for this very object. This enormous contribution in itself indicates the gigantic nature of the work, but it is by no means certain that even this large sum will be adequate. An enormous amount of good can be done by the judicious expenditure of this money, and all would desire that as little of this money as possible should be spent in the construction of buildings which may prove to have a very limited range of activity, and may ultimately be superseded by less expensive and more effective methods.

The most expensive method of dealing with pulmonary tuberculosis is the provision of sanatoriums, and experience everywhere shows that sanatorium treatment too often ends in failure, especially in the artizan classes. The treatment is costly in itself, but in that the patient must give up his work to secure treatment in a sanatorium, great hardship is suffered by those whose daily bread depends upon the industry of the patient. Sanatorium treatment to be of any real value should be continued for at least six months. There is no other disease for which institutional treatment for a period of six months would be tolerated as a satisfactory method of treatment, because the primary and secondary expenses are prohibitive. Still at the present time the sanatorium seems to hold the field in the eye of authority as the primary and essential weapon for expelling this disease from the community. This is the central idea in the present schemes for treating pulmonary tuberculosis.

Since it can be shown upon the clearest evidence that the money provided by the Government spent in this way could not deal with more than 20,000 out of the 300,000 who, as Mr. Lloyd George tells us, need treatment, and most of the cases thus treated relapse within a few years, even the keenest advocates of sanatorium methods must admit that the vast majority of sufferers are unprovided for. This has long been recognized in Germany, and Professor Loeffler suggests that tuberculin dispensaries may greatly simplify the problem, and bring within reach of the vast majority much needed help and relief.

It has occurred to me that a summary of the results obtained at my tuberculin dispensary in London may be a practical object lesson of the value of our system.

For this purpose I have taken 100 unselected cases that came to our dispensary in 1912. These cases were the first 100 of a series collected in order from my annual report upon the work of the dispensary. I have taken this group of 100 cases just as they came to hand, so as to simplify the statement in percentages and to eliminate the bias of special selection. I will now analyse the nature of these cases, the results of treatment, and the effects of treatment in reducing the risk of infection. In other words, I will review these cases in the three essential aspects: (1) The aspect of diagnosis; (2) the aspect of treatment; (3) the aspect of prophylaxis.

1. THE ASPECT OF DIAGNOSIS.

Nine were rejected because they showed no positive signs of tuberculosis and did not react to tuberculin. One of these cases had attended St. Thomas's Hospital for

many weeks, and had been advised by Dr. Perkins to go to a sanatorium for three months. I quite recognize that in certain anergic forms of tuberculosis the reaction to tuberculin may fail. But with negative signs in the lungs I advised this man to consider himself healthy for the present. I shall test him again after an interval, and if this test should also prove to be negative, I shall tell him to consider himself healthy.

Of the remaining 91 cases, 44 had tubercle bacilli in the sputum. Thus, of the cases that came to us for treatment, nearly 50 per cent. were indubitably suffering from tuberculosis, demanding serious attention and the best possible treatment.

Nature of the Cases in which Tubercle Bacilli could not be Demonstrated.

It will be remembered that it was stated by Sir Clifford Allbutt, Sir Lauder Brunton, Sir William Osler, and Dr. Arthur Latham, in their report to the Welsh Committee, that—

The success of the so-called tuberculin dispensaries rests largely on the fact that Class I and Class II are chiefly treated at them. (Class I embraces those patients who become infected and recover without knowing they have been infected. Class II includes those who would recover without any treatment, or by taking a holiday at the seaside.) A further part of their success is due to the many instances in which the diagnosis of the presence of active disease is faulty, with the result that many persons are treated with tuberculin and labelled as "cures" in whom the disease has previously been arrested.

I will merely tabulate in sequence the nature of the cases in which, although tubercle bacilli were not present in the sputum (and I presume that one does not expect to find tubercle bacilli in the sputum in cases of tuberculous pleurisy, or lupus, or tuberculosis of joints or glands), we should still be more than justified in diagnosing tuberculosis, especially if there were a local, and general, and focal reaction with tuberculin.

Four had advanced tuberculosis of joints. One of these also suffered a severe haemorrhage from the lung (1 pint). Three had severe lupus.

One had had a tuberculous kidney removed.

One had severe tuberculosis of the larynx with ulceration, swelling of the arytenoids, and a granuloma.

One had tuberculous glands of the axilla with four sinuses. (In parenthesis, I may remark that after treatment every sinus healed.)

Two children had enlarged glands in the neck.

One adult had marked crackling râles at the apex, and obvious signs of actual pleurisy. Nowadays I imagine that no skilful clinician would hesitate to pronounce this to be tuberculosis even without a tuberculin test dose.

One adult had crackling râles in the lungs.

Two patients had empyema, each with a sinus discharging for three years and one year respectively.

Three had haemoptysis (one a pint; one several of more than half a pint, with physical signs of the second stage; and one a quart, and the sister of this last patient had died of tuberculosis).

Three had obvious signs of active pleurisy. One with the physical signs of Stage II and pulse 100 to 110. After treatment the pulse fell to 76 to 86.

One had definite fine crackling râles at the apex, which disappeared after treatment.

One had been to Ventnor.

One had been to Brompton, and subsequently to Frimley. Dr. Dick, of Sevenoaks, and the patient himself are independent witnesses of the wisdom of our diagnosis, and the benefit obtained from tuberculin treatment.

One had nursed her sister, who died of consumption, and had herself an evening temperature of 99.8°, 100.2°, and even 101° for three weeks before beginning treatment, and her pulse was 120. After treatment up to 1 c.cm. old tuberculin the temperature was never higher than 99°, and the pulse was 90.

One had been out-patient at Brompton, and was diagnosed by school doctor; two of his sisters had died of consumption within three years.

One went to a sanatorium and gained a stone. On her return she began to lose weight again, and is now back with us, with apparent return of signs and symptoms, hardly three months after leaving the sanatorium. This case is being watched, because if she is quite well there is no need to treat her.

One had an evening temperature of 99.4° to 99.8°; had lost weight, and reacted to 100.2°. After treatment she gained 5 lb.

One had lost weight and strength, and the pulse was 110 to 116. After treatment she gained 8 lb., and recovered her normal health. She reacted to 0.001 c.cm. old tuberculin (100.6°), with marked local and general signs.

One lost 20 lb., and was very weak. Had cough and night sweats, and her mother died of consumption. She reacted to 0.003 c.cm. old tuberculin (103.8°).

One had nursed her sister, who died of consumption. She reacted to 0.005 c.cm. old tuberculin (102.4°).
 One came from British Guiana on account of ill health; loss of strength; loss of weight. Reacted (100°) with very typical arm. After treatment he recovered health and energy, and gained 10 lb.
 One had severe reaction to 0.001 c.cm. old tuberculin (102°) and many reactions afterwards. After treatment returned to work quite well.
 One had loss of health and lost 2 st. in weight, and reacted generally, locally, and focally.
 One had tuberculous disease of glands of neck, discharging. One had mitral stenosis as well. She reacted to 0.003 c.cm. old tuberculin (100.6°). She was treated up to 1 c.cm. old tuberculin, and she is the best judge of the benefit she received.
 One had haemoptysis. Lost 1 st. Pulse 100 to 110. After treatment to 1 c.cm. old tuberculin, great improvement; pulse 86.
 One reacted, but gave up treatment because it caused such swelling of the arm.
 One had general, local, and focal reaction. Cough much worse; pulse 90, and symptoms of malaise and loss of strength. After treatment health restored.

Thus we have accounted for 42 cases out of 47 in which a clinician of ordinary experience could not avoid the diagnosis of tuberculosis in an active form, producing either typical lesions (lupus, arthritis, pleurisy, empyema, abscesses, haemoptysis, ulceration of larynx, enlarged glands, sometimes with sinuses) or the typical symptoms more often associated with tuberculosis than with any other disease—such as great loss of weight, night sweats, rapid pulse, and general loss of health and vigour, in one or two cases with an evening rise of temperature of special significance.

One of the mildest cases that came to us was readily accepted for sanatorium treatment, but it is extremely doubtful whether the treatment will have any lasting effect. However, this mild case had no tubercle bacilli in the sputum, and it remains to be seen whether the sanatorium treatment of this mild case is going to be a success. The patient has already come back to us because she feels in herself that she is losing ground.

Summary.

It will thus be seen that out of 100 cases which came before us in this period not more than 5 could by any stretch of imagination belong to "Class I" and "Class II" of the report of Sir Clifford Allbutt, Sir Lauder Brunton, Sir William Osler, and Dr. Arthur Latham. These authorities, therefore, not merely went out of their way to prejudge our work without knowing anything about it, but made the gratuitous statement that our successes were due to the fact that the cases treated by us would have recovered if they had been sent for a trip to the seaside or without any treatment at all.

I admit that in this series of cases 5 out of 100 might have kept well without treatment; but of these 5, one gave up treatment early because it interfered with her work. Another also gave up treatment, although the treatment caused him to gain 12 lb. Another case of definite disease some years ago was sent by Dr. Silva Jones, and it is possible that this case might have continued well without treatment—how long it would be difficult to say.

Thus the number of cases treated by us in which the tuberculin reaction was the chief factor in the diagnosis of tuberculosis amounts to 3 per cent. I have no hesitation in saying that in every sanatorium quite as many cases would be found in which the diagnosis of tuberculosis was equally problematical, because when I was working in Sydney I rejected, chiefly on account of the absence of physical signs, but also on account of the absence of a reaction to tuberculin, not less than 60 cases which had been condemned to sanatorium treatment by men who were considered competent authorities upon diseases of the lung.

Moreover, by using the tuberculin test upon this present series of cases, I found that in 46 cases out of 100 which were tested with tuberculin, because no tubercle bacilli were to be found, 9 of them did not react, and yet one of these cases, manifesting no physical signs and giving no tuberculin reaction, would have gone to a sanatorium if I had not prevented it.

This series of cases shows, therefore, that while possibly I made a mistake in accepting 3 cases in which the diagnosis was open to question, if one disregards the value of the tuberculin reaction, on the other hand the use of

tuberculin enabled us to decide positively that in 9 cases already suspected to be tuberculosis there was no tuberculosis—a decision that would have been quite impossible without the tuberculin test. I am certain that the meaning of a positive reaction to tuberculin is largely misunderstood, and its value much underrated, while the value of a negative reaction to tuberculin seems rarely to occur to the minds of medical men. Within the last two years I have demonstrated to many medical men the great value of a negative test. In no fewer than nine cases in which the diagnosis had been taken for granted, or was considered extremely likely, I proved that the lesion had nothing to do with activity of the tubercle bacillus. In one particular instance a doctor's son had consulted sanatorium authorities, who had advised that the boy should be sent to a sanatorium. I tested him in the most exacting way, and he gave not the slightest reaction. Further, it is obvious that in those who have no tuberculosis an injection of tuberculin cannot do any harm. The main effect that I have noticed is that the person thus injected may gain 2 or 3 lb. in weight. If there should be tuberculosis, tuberculin may be the only means of detecting it with certainty. But once it is detected, then it is for other clinical criteria to determine whether the disease is in such a state of activity that it is wise to try and limit and annul its activity by artificially stimulating cell tissue to produce active and specific antibodies.

The danger of not using tuberculin for diagnostic purposes is clearly demonstrated by two cases that came to us from Brompton Hospital—cases that had been examined by Dr. Batty Shaw and pronounced to be free from tuberculosis.

One patient with symptoms of asthma and bronchitis came to us within two or three weeks of attending Brompton Hospital, and the first examination of the sputum disclosed tubercle bacilli. Now we may take it for granted that tubercle bacilli were not present when Dr. Batty Shaw made his diagnosis. If, then, a test dose of tuberculin had been given, the mistake in diagnosis would have been avoided. This patient improved very much under tuberculin treatment, and during treatment the tubercle bacilli disappeared from the sputum and have not reappeared.

The second patient was a boy of 16, who looked delicate, and his frame, especially the form of his chest, suggested the tuberculous diathesis. Tubercle bacilli were found in the first examination of the sputum. Under treatment he gained 2 st. and more, and the tubercle bacilli disappeared.

By the use of tuberculin as a diagnostic agent we were able to exclude tuberculosis in 9 cases out of 46, although these cases had been labelled as probably tuberculous, and one of them, but for us, would have gone to a sanatorium. On the other hand, by not using tuberculin for test purposes, a well known hospital physician had excluded tuberculosis when it most certainly existed.

This careful analysis of the nature of the cases that were examined and accepted by me as cases of tuberculosis must surely be sufficient evidence that they do not belong to Class I or Class II in the classification of the authorities already mentioned; they manifested symptoms and physical signs which, without recourse to the tuberculin test would have been considered eminently suitable cases for serious and systematic treatment.

The dispensary has been visited by numbers of medical men, some of whom had the opportunity of examining and observing these patients frequently, and I am ready to appeal to these medical men to vindicate our claim to be competent judges in this field of practical medicine.

It has been necessary for me to enter into these details because in no other way can I show that we are dealing with anything but selected cases or favourable material. It may be interesting also to add that since the Insurance Act came into force we have recommended to the Insurance Committee some scores of cases for sanatorium benefit. Every one of these cases has been subsequently examined by the special expert of this Committee. In only one instance has the correctness of our diagnosis been questioned. In this instance I erred on the side of caution. The man had had tuberculosis, and, as he still reacted to tuberculin, I decided after some hesitation to refer him for treatment.

2. THE ASPECT OF TREATMENT.

Having thus established the fact that at the dispensary more than 95 per cent. of the cases treated belong to Class III and Class IV of the above-mentioned authorities,

we may now proceed to consider the aspect of treatment.

In considering the cases that have come before us we have carefully arranged our plan so that other aids in treatment should, as far as possible, be excluded. In one particular alone has it been necessary sometimes to infringe this general rule. Tuberculin is not a cure for starvation, and as we draw many of our patients from the poorest classes we frequently had to supply food through our Care Committee. Tuberculin treatment requires for its success a certain vitality of tissue, and without proper food this vitality cannot be ensured. But, apart from supplying small quantities of milk to patients, we may say that we have carefully avoided drug treatment, or even the open-air methods. Both of these systems have their value, but if we had adopted them as a matter of principle we should have vitiated our conclusions concerning the value of tuberculin.

Our plan of treatment is to begin with small doses of bovine preparations and then proceed to the stronger tuberculins made from tubercle bacilli of the human type. In the majority of cases we consider that a dose of 1 c.cm. old tuberculin without reaction is sufficient for the first course. It is not always sufficient. It often produces great improvement, but still greater improvement can sometimes be secured by giving also a course of treatment with bacillary emulsion.

Results.

The number of cases examined was 91, and of these 44—nearly 50 per cent.—had tubercle bacilli in the sputum; while 42, without tubercle bacilli in the sputum, had the obvious signs and symptoms of tuberculosis in some form. Of the remaining 5 cases, in which the diagnosis was not so certain and was made chiefly upon the tuberculin reaction, 2 ceased to come after a few visits. I did not urge them to continue, because I felt that possibly by general methods they might be able to successfully resist the disease. Thus at most 3 cases were treated in which, although there had been tuberculous infection, the reasons for recommending tuberculin treatment were not urgent. The decision was left to the patients themselves, and in these 3 cases the patients were well satisfied, so that no great harm was done. With regard to the 86 cases of definite tuberculosis that presented themselves for treatment some were rejected or did not receive treatment for various reasons.

Nineteen of these cases were in Stage III of pulmonary consumption. Twelve of these 19 cases were too late for any hope of successful treatment. Most of them had mixed infections, and some of them went to sanatoriums. Three others gave up treatment for family troubles. In one instance a woman lost her husband, who was killed by an accident in the street. Two other women were pregnant and could not attend after the child was born. One patient had cirrhosis of the liver, and alcohol had ruined his health.

Two cases left the district and could not be traced. One patient had severe asthma and bronchitis, and was recommended to have treatment to the nasal passages before having tuberculin treatment.

One woman elected to go to Brompton Hospital as it was more convenient.

One had a positive Wassermann reaction and was sent away for special treatment.

Two others (one of them in Stage II-III) were found to be unsuitable, and advised to go to a sanatorium.

Apart from the cases in Stage III there were:

Three cases of mixed infection; 1 was sent to a sanatorium, another to Bournemouth.

One man made fair progress, and then progress stopped. In this instance the man could not obtain enough food, and therefore was advised to discontinue treatment.

Three others gave up treatment for various reasons; 1 because it made her arm swell; 1 because it interfered with her work, yet her sister was dying of consumption.

One gained 5 lb. after having treatment, and then left off.

Of the 91 cases 76 had pulmonary tuberculosis, 44 of them with tubercle bacilli in the sputum. Thus 58 per cent. of the lung cases had tubercle bacilli. This proportion is far higher than that in most sanatoriums. This is further evidence that the cases that come to us do not furnish favourable material, and most surely disproves the truth of the judgement passed upon tuberculin dispensaries by Sir Lauder Brunton, Sir Clifford Allbutt, Sir William Osler, and Dr. Latham. Of these:

Twelve were in such a hopeless condition that treatment could not be attempted.

One had a positive Wassermann reaction, and was sent away for special treatment.

Two others, though in Stage II, had very severe and extensive laryngeal tuberculosis.

Three cases had mixed infection, and could not be dealt with.

One case went to Brompton.

Three other cases gave up treatment after a few doses for no particular reason.

Nineteen cases of pulmonary tuberculosis in Stages I and II of the disease, with tubercle bacilli in the sputum, were treated up to full doses, and of these 10 had no tubercle bacilli in the sputum after a full course of treatment. Of the other 9, 1 had no phlegm at all through the day, but in the scanty phlegm of the morning a very few tubercle bacilli were discovered.

Thus treatment caused the disappearance of tubercle bacilli from the sputum in more than 50 per cent. of the cases in Stage I and Stage II. There is no record at all of any of these patients being seriously ill after a reaction, nor was there any evidence supporting the idea that tuberculin given in large doses made the patient worse rather than better.

The number of cases of tuberculosis treated, including pulmonary tuberculosis, was 55. Of these, 50 received at least 1 c.cm. old tuberculin. One patient had in addition 2 c.cm. T.E., one had 3.3 c.cm. T.E., and one 1.5 c.cm. T.E. The remainder received $\frac{1}{2}$ c.cm. of either P.T. or old tuberculin. All but two were benefited. One was neither better nor worse, and one was worse after treatment.

One of the patients came to us with tubercle bacilli in the sputum. Two years previously she had been to Brompton and was advised to live in the country. She lived in the country for two years, and not getting better she came to us. Tubercle bacilli were found, so that the treatment in the country had not cured the disease, and yet living in London and merely having tuberculin injections did her a vast amount of good, and tubercle bacilli disappeared from the sputum.

3. THE ASPECT OF PROPHYLAXIS.

These records show that the treatment given at tuberculin dispensaries in well-marked cases of pulmonary tuberculosis, with tubercle bacilli in the sputum, produces almost uniform improvement, and causes the disappearance of tubercle bacilli from the sputum in a larger percentage of cases than can be claimed by simple sanatorium methods. This result discloses a two-fold advantage: it is the best possible evidence that tuberculin treatment favours the healing of the lung so that tubercle bacilli no longer escape from the tissues; and, next, it converts infectious into non-infectious cases. There are many who say glibly enough, "Prevention is better than cure," and yet refuse to see the great advantage thus gained by rendering infectious cases non-infectious. This is an aspect which should attract medical officers of health. It has been shown again and again by first-class authorities—by Turban, Bandelier, Moeller—as well as by myself that tuberculin treatment yields far better results in this direction than any other method. The results of sanatorium methods alone in diminishing the number of cases discharging tubercle bacilli in the sputum are very disappointing.

I think, too, that a practice is just beginning to come into vogue which may help to establish the value of tuberculin treatment. It has been suggested by myself and others that, if expense is no consideration, one, two, or three months in a sanatorium may be useful. In some cases this is indispensable, especially if there is mixed infection or serious deterioration of the health from other causes. When, however, expense is a serious item, this practice of a short term of sanatorium treatment should only be carried out when it is indispensable. The success often attained by tuberculin treatment alone is such that it is a wise policy first to try what can be done with tuberculin alone at tuberculin dispensaries, so that money should not be thrown away upon sanatorium methods when simpler and cheaper methods can secure equally satisfactory results. These satisfactory results can only be secured at dispensaries where tuberculin is given in a way that fulfils the most exacting conditions required by those who claim to have obtained successful results. The discredit into which the use of tuberculin has fallen is mainly due to the fact that hitherto in England no serious and systematic attempt has been made to test the value of tuberculin given in reasonably large doses in accordance with

the views of Professor Koch and his leading disciples. Beyond a doubt, there is abundant evidence to show that the administration of small doses, even with the control of the evasive opsonic index, has proved to be anything but a success—certainly a partial, perhaps a complete, failure. It is surely wise to give a fair trial to a system which is supported by experiments upon animals, and also by a large number of observations made by competent authorities in the treatment of tuberculosis in human beings.

My own observations compel me to advise the exclusion of cases of lupus, at any rate in adults. Until I came to England I had no opportunity of studying the effects of tuberculin in lupus. I admit that for the most part I have tried tuberculin in very advanced and long-standing cases of lupus, and the results in such cases have been certainly very disappointing. Improvement sometimes follows, but on the whole the remedy, even in large doses, largely fails—certainly in advanced cases.

On the other hand, we have obtained at the dispensary a remarkable uniformity in cases of tuberculosis with discharging sinuses. I have seen sinuses leading from the joints or from glands, or from organs, healing up in the most satisfactory way when large doses of tuberculin have been administered.

In one instance a woman had eight dreadful sinuses leading from the hip-joint. She was reduced to a skeleton, weighed about 7st. 8 lb., could not sleep without morphine, and was utterly miserable. She travelled about fifteen miles twice a week to the dispensary. At the end of a few months four of the sinuses healed. In another few months two more healed, while two resisted. Then after giving a cubic centimetre of old tuberculin, we put her on a course of T.E., up to two or more centimetres at a dose, and finally all the sinuses were healed. These sinuses had been in existence for years. From the moment tuberculin was given she began to put on weight, and finally reached a weight of more than 10 st. She is now quite free from pain, looks healthy, and the whole character of her life has been changed.

This is an unusual case, but in every other case, apart from empyema, with discharging sinuses, the discharges have ceased, and the ulcers have healed after the use of large doses of tuberculin. The scars formed after this healing process are remarkable for their smoothness and evenness, unlike the puckered and wrinkled scars that form when by chance healing takes place by natural processes.

I have little doubt that when the effects of tuberculin treatment in Stage I and Stage II of pulmonary tuberculosis have been carefully and impartially studied this method of treatment will come to be adopted as the essential method of treating the disease itself, so that the custom in vogue of sending the victims of tuberculosis to sanatoriums will be largely superseded by treatment in special dispensaries. This will be an enormous gain to the unfortunate sufferers, and will tend to lighten the load of the over-burdened taxpayer.

I do not suggest that any method of treatment will be always successful. Some failures are inevitable, even with the best treatment. There are pessimists who think that the results of the treatment of tuberculosis are pretty much the same under all systems. This view should only be expressed by those who have tried the various methods in some logical way and obtained similar results with all of them. Unfortunately, the pessimists who have the loudest voice are those who have never seriously used any method in such a way and for such a length of time as to justify them in forming a just opinion. Certainly better than this is it to cling to some method, as I do, which certainly gives extraordinary results in many cases, in the hope that greater experience and deeper knowledge may extend these beneficent effects to a wider circle of beneficiaries. A true physician must primarily consider and work for the good of the individual, though he should at the same time avoid working against the good of others. The physician's moral duty is obvious, but the victim of the disease may find his moral duty in conflict with his material instincts. From very long experience with tuberculin I have personally no hesitation in strongly recommending that it should be used as a remedy in all cases of simple, uncomplicated tuberculosis, whether in the lungs or elsewhere. I am convinced that in Stage I and Stage II of the disease tuberculin can do more for the patient than sanatorium treatment, especially if the patient has to return to his ordinary occupation in cities. Sanatorium

authorities tacitly admit this, because it is part of their principle to provide farm colonies and after-care societies. It is hoped that thus the resistance to the disease will be heightened. The resistance is not necessarily heightened in this way, but so long as the patient lives a free and easy life in the country relapse of the disease may be postponed. Should such cases then return to town conditions it would probably be found that their resistance had been in no way increased. Prolonged sanatorium treatment fails to afford any great protection against relapse, if the patient has to return to his old conditions. If there is one thing that is striking about tuberculin treatment it is that even when the home conditions are not altered, surprisingly good results can be obtained by means of tuberculin, and also that these results last well, because it is unusual to find relapse taking place after tuberculin treatment within a year. It is also a usual experience to find that after a prolonged course by means of large doses of tuberculin the improvement continues long after the treatment is suspended, and relapses are far less frequent and occur much later than in similar cases treated at sanatoriums. If this be true, it is reasonable to expect that in time Insurance Committees will see the wisdom of treating the majority of insured persons suffering from tuberculosis at tuberculin dispensaries, instead of adopting the expensive and too often ineffective method of removing the patient from unfavourable surroundings, placing him in comfortable and pleasant surroundings for a few months, with the expectation that such institutional treatment may arrest the disease—an expectation that is doomed to disappointment in the great majority of cases, because, for one reason, this unfortunate patient must return to the old conditions of home and environment.

A year and a half's experience of the Insurance Act proves that sanatorium benefit, which at one time was to take the form of "first-class hotel accommodation," has now, in the majority of cases, dwindled down to domiciliary treatment by a panel doctor. If the panel doctor is to dispense sanatorium benefit, there can be neither sanatorium treatment nor tuberculin treatment. Both sanatorium treatment and tuberculin treatment demand expert knowledge and experience. The suggestion of the Special Committee of the British Medical Association, that tuberculin treatment should be administered by panel doctors in rotation, has been wisely abandoned. In the majority of cases sanatorium benefit is now dispensed through tuberculosis dispensaries by tuberculosis officers working within the jurisdiction of Public Health officers. I still think that this arrangement is not a wise one, because hitherto health authorities have had little or nothing to do with the treatment of tuberculosis, and accordingly the treatment will depend upon the tuberculosis officers, many of whom are too young to be thoroughly satisfactory officers as consultants. There is, too, a very great danger that the function of the tuberculosis officers will rather tend towards prophylactic measures than the treatment of the individual. The Insurance Act will thereby become a public health Act. I very much doubt whether legislators and the overburdened taxpayers, and even the insured persons themselves, understood that the Insurance Act was to be applied in this way. The money provided by the Insurance Act for the treatment of insured consumptives should be spent exclusively in sanatorium benefit claimed by the insured persons, and any money spent upon tuberculosis officers and tuberculosis dispensaries for the purpose of public health should not be a charge upon the insurance fund. It is strange that the Labour Party entirely fails to grasp the importance of this distinction. Most of the insured persons should have the sympathy of the Labour Party, and the Labour Party should see that money which has been voted by Parliament as a fund to insure against sickness should be distributed entirely among the insured persons in need of benefits, and that not one penny should be spent in carrying on work for which public health departments exist. There is little wonder that the money provided for sanatorium benefit should be completely exhausted when a large part of it has really been spent on services, carried out by the tuberculosis officers, which have nothing whatever to do with the treatment of insured persons. Tuberculosis officers spend a great part of their time in doing public health work instead of devoting their time to the treatment of the insured. I doubt whether a proper

system of dispensing adequate sanatorium benefit to insured persons will be established until there is a differentiation of the function of the tuberculosis officer as the expert in the treatment of tuberculosis in all its forms from that of the medical officer of health, whose business it is to administer measures for the prevention of tuberculosis.

The great danger of bureaucratic government is that systems become stereotyped, and the danger is the more serious when sanatorium and medical benefits have to be administered, because the treatment of disease must fail to give good results as the machinery becomes obsolete and the systems and ideas antiquated. The panel system is on its trial; it must profoundly modify the relations existing between the medical man and his patients. It may tend to convert a large section of the medical profession into dispensary doctors, who may be able to earn a livelihood without ensuring to their patients satisfactory treatment. Some few may be strong enough to rise above such conditions of service, but the tendency will be to convert the medical man into a machine producing work of an inferior quality. I should fear that this must tend to degrade the medical profession as a whole. Legal work of this sort would hardly be worth paying for.

By the scheme evolved by a special committee, which gives the first place to sanatoriums as the chief channel for dispensing sanatorium benefit, failure seems inevitable on financial grounds alone, but perchance the officers of approved societies may save the Act, so far as medical benefits are concerned, from sharing in this failure. While, therefore, there may be no urgent reason for investigating the general results of the Insurance Act, it would be wise, even now, to constitute a commission of inquiry into the results of sanatorium benefit. Such an inquiry would show how many cases have sought relief, how many have been treated, by what system of treatment, and with what success.

I still think it is unwise to enter upon a policy of constructing new sanatoriums until there is evidence from the results obtained in the last year that they have yielded something approaching to "the amazing number of cures" obtained, according to Mr. Lloyd George, in German sanatoriums. At the same time the results of dispensary treatment might be investigated, and although tuberculin has not been used in any uniform way, and too often favourable cases have been transferred from a tuberculin dispensary which is not popular with the Insurance Committee to dispensaries where tuberculin as a remedy is for the most part ignored, still inquiry may show that tuberculin dispensaries have yielded some satisfactory results.

A CONTRIBUTION TO THE CRITICAL STUDY OF THERAPEUTIC STATISTICS.

BEING CRITICAL REMARKS ON THE LECTURE OF DR. BATTY SHAW ON THE PRESENT EVIDENCE FOR AND AGAINST THE USE OF TUBERCULIN AS A SPECIFIC CURE.

BY

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IN his lecture, published in the BRITISH MEDICAL JOURNAL, May 3rd, 1913, directed against tuberculin treatment, Dr. Batty Shaw starts with a comparison of the serum treatment of diphtheria, the value of which is generally recognized, with tuberculin treatment, of which, in his opinion, the value is less generally known. To me this comparison is altogether inadmissible. No well-informed adherent of tuberculin treatment sees in it anything comparable with the serum treatment of diphtheria, and I have constantly had occasion myself to utter a warning against the popular error that tuberculin treatment is equivalent to antitoxin treatment. This inapt comparison is a constant source of error and confusion and of the incorrect use of tuberculin.

It is also very surprising to me that in combating the value of tuberculin the author shows not the least chronological sense, but reverts time after time to the experiments of Koch. That Koch made a mistake in the

interpretation of the results which he then obtained is quite generally recognized by the adherents of tuberculin treatment, and no one bases himself now, as Dr. Batty Shaw appears to assume, on these far-distant experiments. On the contrary, it was the absence of any confirmation of these experiments which was the cause of the almost complete disappearance of tuberculin from medical practice in the Nineties. Dr. Batty Shaw's attack on these experiments and on Koch's teaching seems to me like tilting at windmills. The fact that in spite of Koch's failures tuberculin was not entirely set aside in the practice of scientific physicians, and that with radically altered method and essentially different theoretical conception it is coming into increasing use at the present time, is undoubtedly due to the existence in tuberculin treatment of a useful kernel, which Koch himself was unable to isolate, but whose isolation, as I have shown in my monograph on tuberculin,¹ has since been obtained by an immense outlay of clinical and experimental work. It is not admissible to ignore this work in the way that Dr. Batty Shaw does, especially after the translation of my monograph has made these researches accessible to the English reading public.

It must excite the greatest surprise when the author points in all seriousness to quack medicine, with its reports of all manner of cures and remedies, unable for a moment to stand criticism, as an argument for the assumption that the whole results of modern tuberculin treatment rest only on the confusion between *post hoc* and *propter hoc*. No branch of medical treatment deserves this comparison with quackery less than tuberculin. I contend that no section of therapeutics is better grounded in science and reason, and that this is because this method of treatment has rightly forsaken the ground of rough and deceptive statistical empiricism which, as is evident from the whole train of thought of his lecture, determines Dr. Batty Shaw's attack. By this rational basis and by the careful criticism which is demanded by each individual case, tuberculin treatment is honourably distinguished from quack medicine, as well as by the fact that its reintroduction after the *débâcle* of the Nineties was exclusively due to progress in scientific knowledge. There is therefore a grave injustice in Dr. Batty Shaw's comparison between the quack doctor's lack of criticism and the similar lack which he assumes in the tuberculin therapist, and this reply will show on which side the deficiency really lies.

The theoretical remarks of the author are concerned with things as they appear on the surface, and are very one-sided. The detailed discussion of these would only be possible on a far broader basis, and I refer the reader who wishes seriously to form his own judgement on the subject to my monograph. I will content myself here with taking up a few points which seem to me specially questionable.

In the first place, the author's argument against tuberculin treatment is quite unintelligible when he states that it is improbable that the amboceptor action can make itself felt on the bacilli and on the toxin of the tuberculous nodules, because these nodules are shut off from their surroundings. It would be indeed a boon if such an exclusion existed. There would then be no need to bother our heads any longer about the treatment of tuberculosis. That the action of tuberculin, and therefore of amboceptor, really extends into the interior of the remotest tubercles, has been clinically and anatomically established (the latter especially at the time of Koch's era of tuberculin treatment) by the clinical and anatomical proof of the so-called focal reactions. That the author shares the incorrect view that anaphylatoxin is a combination of complement, amboceptor and antigen, I will be content with just mentioning. His view that in anaphylactic phenomena, which are also at the basis of modern teaching on tuberculin action, no curative side is to be recognized, should find little approval, and is a part of a generalization hardly in unison with physiological thought. The more favourable course of relapses in pneumonia, erysipelas, etc., cannot be considered simply as evidence of immunity in the face of the frequency of such relapses; must it not rather be attributed to the curative action of anaphylaxis, or better of hypersensitiveness (allergy)? And are not the rapid and abbreviated course of revaccination in comparison with primary vaccinia (von Pirquet), and the stormy but curative course of tuberculous infection in the case of cattle previously treated by Behring's method (Römer), or of the reinfection of already tuberculous animals (Koch, Römer) incontro-