

and you, gentlemen and friends, with all my heart. It is very seldom that events of this kind occur in the lives of any of us, and the knowledge of this only makes me the more sensible of a singular good fortune and of your encouraging friendship. It is certain that, whatever may be the aims and efforts, the anxieties or the vicissitudes of the time to come, the recollection of this evening must remain a fresh and treasured memory and be a constant stimulus to work and hope. There are many here besides myself who were pupils of yours, Mr. Lockwood; I should think that, without exception, they would agree that we learnt from you something more important even than the facts of anatomy and the art of surgery, distinguished as you are for the accuracy and precision of your exposition of them. We learnt, to borrow a phrase of your own, that men's opinions after all are of little enduring moment, but that the reasons for them may be of much consequence; that a careful ascertainment of the facts, and honest and fearless dealing with them, are essential to real success in any enterprise. Sometimes the qualities which youthful discipleship attributes to a teacher are found with ripening experience not to be fully warranted; but I believe that the longer most of your pupils live, the more impressed they become with the wisdom and value of your precept and practice. For this reason, I cannot but take a real pride in the fact that you are associated with this toast. One sees around us, Sir, old friends and new. Those who in the city of Sheffield gave me a first opportunity for work and responsibility. Friends of twenty years or so in the field of anatomy. We have fought side by side, or against one another, many a time, fairly, but with a common purpose. He is a poor fellow who has no pride in his own craft. Making full allowance for this, however, I do not shrink from saying that you will go far, Sir, in the ranks of medicine to find a wider-minded and more capable set of men than British anatomists, taking them all together. We used to think sometimes that that great hierarchy who use consulting rooms looked down upon us, but that day is past. There are many here too, Sir, who have been staunch supporters in a combat—recent, but now happily past, and one which I believe will not be resumed. There are some, too, who equally sincerely were opponents. There are others, also, personal friends and more, to whose strong loyalty and unselfish labour I owe so much in my constituency. And now, may I say, Sir, how well I know all that your presence here this evening means, how great an honour you do to me and my friends, and that it is not possible to thank you as I would like. The fact that you have set aside an evening for this purpose out of a life that is full of work in great matters and with enormous responsibilities speaks for itself. All present here, Sir, do not agree with your political views or mine, but we shall all agree on this—that there is probably not a place in the land, not even the smallest village, where there cannot be found some who bless your name, and some who do the opposite. It is more needful for your guest than for yourself to bear in mind the exhortation: "Beware when all men speak well of you." For my part I make no cloak of it. I am proud that you are here, because I know, and it has been my privilege to have many opportunities of learning, that through your fortunes you have one fixed purpose—to use your powers to the utmost in the furtherance of enterprises that you believe to be for the betterment of the condition of the people. I have myself a good deal of confidence that in time to come the medical profession will recognize that these great plans which your genius conceived and power initiated have formed the starting point for improvements, not only in the public health, but in the science and character of the practice of medicine, which were both necessary and fundamental. Dr. Addison then proceeded to make the observations printed in full above.

Dr. LAURISTON SHAW proposed the health of the Chairman, and Mr. LLOYD GEORGE, in the course of a short reply, said that he could not have imagined a year ago that he would so soon have dined—he would not say with impunity—with a representative gathering of doctors such as were present that evening, but he well recognized that those who fought the hardest proved in the long run to be the best friends. He had learnt to understand the medical profession infinitely better than he did when he started. In a few words he spoke in terms of the highest admiration of the

statesmanlike address which Dr. Addison had delivered. He would like this address to be published as a separate document and circulated throughout the whole kingdom. It would enlighten public opinion. The medical profession should enlighten and guide public opinion as to what could be gained by co-operation between the public and the medical profession. He thanked the proposer of the toast and those present for the welcome they had extended to him.

THE VACCINATION QUESTION IN THE LIGHT OF MODERN EXPERIENCE.

DR. C. KILLICK MILLARD on February 4th concluded a course of three lectures on the vaccination question in the light of modern experience, arranged by the Chadwick Trustees.

In his first lecture Dr. Millard said that when he first went to Leicester his views on the subject were strictly orthodox, but in consequence of his experience of small-pox in Leicester, he had been obliged to modify those views considerably. He attributed the bitterness felt by the opponents of vaccination to the compulsory clauses of the Vaccination Acts. There was also the repulsion which many persons felt to the introduction of a disease into a healthy child for the sake of preventing another disease, the risk of contracting which was problematical. He set out the following propositions as those to which he had been brought by his own observations:

1. I believe absolutely in vaccination, though with certain important reservations, and I differ *in toto* from the antivaccinist when he asserts that vaccination is a "myth" and a "delusion." I agree entirely with the provaccinist that recent vaccination confers on the individual protection against small-pox, which, for practical purposes, is complete, though unfortunately only temporary.
2. Vaccination, repeated as often as necessary, is invaluable for protecting those who for any reason are specially exposed to the infection of small-pox—for example, doctors and nurses.
3. It is also of very great value for protecting persons after actual exposure to infection—that is, small-pox "contacts."
4. I agree entirely with the provaccinist that vaccination has a remarkable power of modifying and mitigating small-pox for many years after its power to protect against attack has worn out. Moreover, the protection conferred by vaccination can be renewed by revaccination.
5. On the other hand, I agree with the antivaccinist in doubting the value to the community at the present day of infantile vaccination as provided by law. I think that an altogether exaggerated view has been taken as to the effect of such vaccination in preventing the spread of small-pox, which is the real problem before us.
6. I agree with the antivaccinist that sanitation, notification, isolation, surveillance of contacts, and other modern measures which are becoming generally adopted, have played a more important part in the abolition of small-pox from this country during the past thirty or forty years than infantile vaccination.
7. I think the antivaccinist is right when he contends that the drawbacks to infantile vaccination and the injuries to health caused by it are not sufficiently recognized by the medical profession, who, in their sincere anxiety to defend vaccination, have been inclined to minimize these drawbacks.
8. On the other hand, I quite admit that the antivaccinist, in his hostility to vaccination, has frequently run into the opposite extreme and grossly exaggerated these drawbacks, whilst endeavouring to prejudice the question of vaccination by making wild assertions about the nature and origin of vaccine lymph, etc.
9. There is distinct evidence that small-pox is leaving this country in spite of the increasing neglect of vaccination, and it seems probable that such neglect of vaccination will continue to increase until the great majority of the population has become unvaccinated. I am inclined to believe that when this happens the problem of small-pox prevention will very possibly be simplified and made more easy rather than more difficult.
10. The great difficulty in controlling the spread of small-pox at the present day is the occurrence of very mild unrecognized cases of the disease which spread infection broadcast before any precautions can be taken. It is an important fact, the significance of which does not appear to be sufficiently appreciated, that these mild unrecognized cases which do so much mischief, and which go so far to thwart our efforts to control the spread of the disease, occur almost entirely amongst vaccinated persons and *because they were so vaccinated*. In other words, it would seem that infantile vaccination, by its very success in mitigating small-pox after its power to protect from attack has worn out, may have a distinct tendency to encourage the spread of the disease. It is possible that this tendency more than neutralizes any benefit which the community derives from the fact that vaccination largely protects the child population from small-pox.

Dr. Millard proceeded to elaborate his thesis. Dealing first with the proposition that vaccination had a protective influence against small-pox so far as the individual was concerned, he said that he regarded this as axiomatic, and practically the whole of his case was based upon it. The protective influence of vaccination upon the individual was not the real vaccination question, which was, What was the protective influence of vaccination upon the community? The distinction between the individual and the community had been largely overlooked. He showed a number of diagrams illustrating the fall in small-pox mortality in London, in England and Wales, and in Leicester. In each case the fall was chiefly noticeable since the "era of sanitation," but especially was this the case in Leicester. The diagrams also showed that a similar and equally striking fall had occurred in certain other zymotic diseases; also that, although the proportion of infants vaccinated had been declining for a number of years, the decline in small-pox mortality had gone on. This was very evident in the case of Leicester. Referring to the Royal Commission on Vaccination, he said that it undoubtedly went a long way towards abolishing compulsion. Many of the Commissioners naturally hesitated to take such a step, because, as they said, "the experiment had never been tried." That was over fifteen years ago. Since then much further experience had been obtained, all tending to show that universal vaccination was less important than was formerly supposed.

In his second lecture Dr. Millard discussed the experience gained in the control of small-pox during the seventeen years which had elapsed since the Royal Commission presented its final report in 1896. As a result of the loophole afforded by the conscience clause of the Act of 1898, infantile vaccination had been increasingly neglected. At the same time greatly increased attention had been paid to modern methods of dealing with small-pox, such as hospital isolation, disinfection, surveillance, and vaccination of contacts, etc., and small-pox mortality had continued to decrease until, during the past eight or nine years, it had been almost a negligible quantity. In 1897-8 a very severe epidemic had occurred at Middlesbrough, a town in which infantile vaccination had been carried out with exemplary thoroughness, but in which sanitation was very unsatisfactory. There had also been a serious epidemic at Dewsbury, where vaccination had been much neglected, but the absence of adequate and proper means of isolating the disease quite accounted for the magnitude of this outbreak. In 1902-4 epidemics occurred in a number of towns, including London, but in most the disease was kept fairly well under control. Moreover, in very many other towns and districts where the disease was introduced it failed to get a hold and was quickly suppressed. Provided only that the cases were promptly recognized and reported, small-pox appeared to be one of the easiest of zymotic diseases to stamp out where modern methods of dealing with it were employed. Dr. Millard expressed his belief that the extent to which infantile vaccination was practised had very little to do with this. Small-pox was a disease which under modern conditions spread chiefly through adults and not through children, and the latter were the only section of the population which infantile vaccination really protected. The real difficulty in controlling the spread of the disease lay in the occurrence of very mild cases, so trifling in their symptoms that their true nature was not recognized. Either the persons attacked consulted no doctor, or the medical man called in failed to diagnose their complaint as small-pox. Consequently, the cases were not reported to the authorities, the persons attacked were not isolated, and no precautions were taken. The very mild cases which were apt to escape recognition occurred chiefly amongst persons who had been vaccinated, but whose vaccination was no longer able to protect them from attack. As instances of the mischief done by modified cases of the disease in vaccinated persons he quoted the following cases:

1. The vaccinated girl, Annie Levy, aged 12, who, owing to the failure of the medical men to recognize the disease, gave rise to the serious outbreak in connexion with the Mile End Poor Law Infirmary in 1911, and who infected—directly or indirectly—52 other persons, ten of whom lost their lives. He suggested that if this girl had never been vaccinated, she would have had an unmodified and more characteristic attack, and whilst it would have been worse for her personally, it was

unlikely that the nature of her illness would have been unrecognized and the whole outbreak would probably have been prevented.

2. The outbreak at Kirkcaldy in 1912, which resulted in 43 cases and 14 deaths, was entirely due to the fact that the first case, in a vaccinated lad of 14, was not recognized as small-pox.

3. The outbreak at Newhaven last year, which resulted in 22 cases and 5 deaths. It was caused by a sailor—no doubt vaccinated, though this fact never appears to have been mentioned—who had been staying at the house where eleven of the cases occurred and who whilst there suffered from a slight illness which the medical officer of health believes to have been small-pox, though this was not recognized at the time.

4. In Halifax, in 1903, the medical officer of health traced 40 cases of small-pox to a well-vaccinated man, a tailor, who had so slight an attack that he did not lie up. Another vaccinated man, E. W., whose attack was not recognized, infected 21 known cases and possibly 5 others.

Dr. Millard said that other towns—Coventry, Cardiff, Leicester, Salford, Bristol, Newcastle, Oldham, Manchester, etc.—had all had similar experience, and quoted the following from the annual report of Dr. James Niven, M.O.H., Manchester.

It is not too much to say that by far the most important factor in the spread of small-pox in Manchester has been the overlooking of cases. . . . The attack, as a rule, was so mild that no medical advice was sought, or, as happened in not a few instances, was not recognized as small-pox by the medical attendant. In fact, this matter is of so much importance that it is not too much to say that if there had been no case overlooked there would have been practically no small-pox outbreak in Manchester.

It was true that sometimes very mild unrecognized cases might occur in unvaccinated persons, and give rise to outbreaks. This happened in respect of an outbreak in Leicester in 1903, which originated in two slight unrecognized cases in young women who had never been vaccinated. But there was this important difference—in such cases the mild and benign character of the attack was a natural characteristic and was transmitted, with the result that only a mild type of disease was perpetuated. Thus, in the Leicester outbreak referred to, although 43 cases were infected only one case proved fatal. But with vaccinated cases the apparent mildness was artificial or "acquired," and was not transmitted. The severity of the type of disease spread by these very mild vaccinated cases had often been observed, and Dr. Millard said he believed that this was one explanation of the terribly high fatality so often seen amongst the unvaccinated minority in many epidemics. Further, when small-pox attacked vaccinated persons, it did not always manifest a mild type. If the protection had entirely worn out, as was often the case after the lapse of years, the attack would be as severe as if the person had never been vaccinated. This was the explanation of the severe and fatal cases of small-pox that occurred among vaccinated persons in most epidemics. With regard to infantile vaccination, he said that it seemed certain that it would continue to fall more and more into disuse, with the result that the country must depend in future upon hospital isolation, etc. It was unreasonable as well as impracticable, however, to expect the smaller towns and districts to make really adequate provision as regards hospital accommodation for such a remote emergency as a serious outbreak of small-pox. Moreover, such small-pox hospitals as did exist were being increasingly utilized for other purposes. Yet should the emergency arise and the necessary hospital accommodation not be forthcoming immediately, or prove insufficient, a great disaster might readily occur. This was what happened at Gloucester, Middlesbrough, Dewsbury, and elsewhere, and it might easily have been prevented had the Local Government Board been prepared to offer prompt assistance of a practical kind instead of merely giving advice. The possibility of a serious epidemic of small-pox in any part of the country was a national danger which the Government should be prepared to deal with. Dr. Millard suggested that the Local Government Board should keep portable hospital accommodation in constant readiness, will full equipment, including nurses and doctors, to be dispatched at a day's notice to any town or district which was in danger of being overpowered or which applied for assistance. Every detail would, of course, be carefully thought out in advance and arrangements made with large hospitals or nursing institutions for the supply of nurses when required. If the military authorities could do all this, why not the national guardians of

the public health? The expense would be trifling as compared with what had hitherto been spent on vaccination.

In his third lecture Dr. Millard said that it was now thirty years since compulsory infantile vaccination was abandoned in Leicester, and during that period only about 12.3 per cent. of the children born had been registered as vaccinated. The great value of Leicester's experience lay in the fact that it constituted a sort of "control" experiment. In other towns the great reduction which had taken place in small-pox mortality was attributed to infantile vaccination. In Leicester, without infantile vaccination, a similar but even more striking reduction in small-pox mortality had taken place. Hence it was reasonable to doubt if infantile vaccination was the real cause of the reduction anywhere. Moreover, there was another cause, adequate to explain the decline in small-pox, which was common to the whole country, namely, the advent of the sanitary era with all that it included—for example, notification, isolation, disinfection, etc., as well as an immense improvement in sanitary conditions generally—less overcrowding, less filth, and a higher standard of living. Leicester obtained compulsory notification of disease as early as 1878, being one of the first towns to obtain this provision. She preferred to concentrate on sanitation rather than on infantile vaccination, and the result had been a conspicuous success. The deaths, not only from small-pox, but from all other diseases, had been reduced, and the reduction was greater proportionately than in most towns. Dealing with the history of small-pox in Leicester, he contrasted the very serious epidemic which occurred in 1872, and which resulted in 346 deaths, with the three subsequent epidemics which between them had caused only 46 deaths. In the former no serious effort was made to stop the spread of the disease. There was no notification, practically no isolation, no disinfection, and the town was most insanitary. It was important to remember that those responsible for the actual carrying out of the Leicester method had always been believers in the efficacy of vaccination to protect the individual, and had never hesitated to use it for protecting the small-pox staff (for which purpose it was invaluable) and such persons as had been exposed to infection. He regarded the power of vaccination to confer immunity, even after exposure to infection, as a very strong argument against the necessity for infantile vaccination.

Dr. Millard concluded his course by saying that he was satisfied that modern measures, if perfected and promptly applied, were quite adequate for dealing with casual importations of small-pox into this country, even though infantile vaccination became entirely neglected. The chief danger lay in unrecognized cases, especially when occurring in the tramp class. In the rather remote contingency of a really serious epidemic of small-pox occurring again in Leicester, or in any town, he would advise every one to get vaccinated, even though they had already been once vaccinated. It was only recent vaccination that could really be trusted to protect. Nothing was so fallacious in the face of real danger as to trust to vaccination performed many years before.

THE STAMPING OUT OF TUBERCULOSIS.

At a well-attended meeting arranged by the Sunderland Division, held under the chairmanship of Dr. Todd, on January 29th, Dr. SIMS WOODHEAD, Professor of Pathology in the University of Cambridge, delivered an address on how to stamp out tuberculosis.

Professor WOODHEAD said that as a pathologist he was engaged particularly in finding out the causes of disease. Engaged in that work, and not having the stimulus of the curative side of medicine, pathologists were apt to become pessimistic as to the progress they were making in their fight against disease. Nevertheless, in connexion with tuberculosis, even they could not but be struck by the contrasts that were presented fifty years ago and to-day. At one time, before very much was known about tuberculosis, they all of them, both medical men and general public, were essentially pessimistic in their attitude towards this disease. They looked upon it as something almost beyond the possibility of cure. Fortunately that was no longer the case. It had been found that a very large number of cases of tuberculosis had been cured. The first indication

of this fact came by way of the *post-mortem* table. In making autopsies on patients who had succumbed to various diseases it was found that a large percentage of the patients had suffered from tuberculosis at one time of their lives, and had been cured. Indeed, it was calculated that 80 or 90 per cent. of the people who died in later life had at some period or other during their life suffered from tuberculosis and had recovered. The pathologist was thus able to take a wider outlook than the clinician and to see the interdependence of disease producer and resistant or non-resistant tissue. The real advance made by the medical profession in the cure of consumption came when the tubercle bacillus was discovered. As they knew, it was only as the causes of disease had been discovered that they had been able to make proper headway against disease, especially those diseases of the infective type. Tuberculosis was one of the most important of this group. They must look upon tuberculosis as being caused by an organism that could live both inside and outside the body, and it was important that they should study it carefully in both those aspects. Research had revealed that the tubercle bacillus was probably modified by its surroundings, and that, like every other living organism, it adapted itself to the conditions in which it had to live. It could live on dead organic matter; it could live in different animals; and they often found the tubercle bacillus flourishing in conditions in which they did not expect it to do well. It was found in the snake, in the rat, and in various domestic animals. It was once thought that the goat was immune from tuberculosis, but it had now been found that even the goat was susceptible, though on account of its open-air life it was much less subject to "natural" infection than the cow or the calf. This was an important discovery, which suggested the importance of fresh air in combating the advance of the disease organism. The tubercle bacillus was practically everywhere, but it was present in larger quantities in some positions than in others, and wherever it was numerous they had potential danger. Infection depended upon two factors—first, the amount of infected material; and, secondly, the susceptibility or insusceptibility of those who came into contact with that material. They ought to try to diminish the aggregation of the infected material in any one place. In houses, workshops, and all places where people congregated they should try and bring down infection to the smallest possible limits. They had to recognize that the susceptibility of one person was greater than another, and that the susceptibility of children was greater than that of adults. They must also bend their energies to increase the resistance to infection in the individual. That was the main question with which they as doctors, and as persons charged with the preservation of public health, had to deal. They had, he said, many means of defence against tubercle bacilli. First of all, there was the blood. The white corpuscles of the blood possessed the power of killing these organisms, and indeed there were sufficient defences in the body to deal with a number of them. With healthy mucous membranes, it was almost impossible for the tubercle bacillus to pass through the intestinal canal into the body, and so it happened that a certain number of people might drink milk from a tuberculous cow without developing tuberculosis, but they must remember how frail was the defence of children against the bacillus, and seek to stop infection from that and other sources in the interests of the weaker section of the community. The great thing to aim at after doing away with gross infection—large quantities of tubercle bacilli—to minimize the chances of infection was the building up of the defences of the patient. They had to remember that the well-nourished patient was always the patient possessing the greater powers of resistance. They found that as the cost of living had fallen, the mortality from phthisis had fallen. He did not introduce this question of cost of living with any political object, but wished simply to point out, for instance, that the reduction in the cost of flour and other articles of food was always followed by a fall in the death-rate from tuberculosis. This question of a well-nourished body was important, for they found that the tubercle bacillus flourished best in devitalized tissue or in people who were below par. Indeed, it could not develop unless supported by great numbers in healthy, well-nourished tissues. They