ADDRESS IN MEDICINE.

BY

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THE PUBLIC ASPECTS OF MEDICINE.

The Experimental Method.—Its Achievements in Bacteriology and in Physiological and Pathological Chemistry.—The Influence its Results have had on Public Opinion and on Legislation.—Legislative Recognition of Continuous Responsibility in matters of Public Health.—The Sanitary Achievements of the Past and the Needs of the Future.

MR. PRESIDENT.—In the first place it is my duty to acknowledge the honour conferred on me by the Council of the Association and by my colleagues in Birmingham, in appointing me to deliver the Address in Medicine. I value the distinction all the more, because it places me in a position of responsibility under your presidency, and so recalls to me very vividly the pleasant memory that, some thirty years ago, I did my first medical work in this town as your junior colleague on the staff of the Queen's Hospital. I can recall with grateful remembrance the many conferences we had in those days on the problems that confronted us in our daily work, and when I do so I am startled by the marvellous change that has occurred in the mental attitude with which the profession now regards disease. Like yourself, Mr. President, a student of the Dublin School of Medicine—a school then essentially clinical in its traditions—I had come to Birmingham to breathe a new atmosphere of modern thought and scientific enterprise. The school I had left was the one in which authority held sway with unbroken strength latest in the United Kingdom, and the school which I joined was in a town not celebrated at any time for a blind reverence for authority, and never much influenced by ancient traditions. It was a fresh and bracing intellectual change of air. The characteristics of the place and the time were a healthy scientific scepticism—a dogma-destroying doubt, before which cherished credulities were crumbling away, and religious and social faiths were questioned and analysed with a new spirit and a new freedom.

Well, in those days, in the struggle between the old principle of authority and the modern spirit of doubt, it was beginning to go hard with the metaphysical battle cries of the old school of medicine. The *vis medicatrix nature*, which had been a popular fetish, and the change of type theory of disease, which had all the consoling virtues of extreme unction for the passing generation, were rudely questioned by the younger men as final explanations, and were being generally realised at their true values as temporary hypotheses based on partial truths. They had served our predecessors, groping their way through metaphysical mists, but they had now become impediments to the onward march of exact thought. The new school,

Not clinging to some ancient saw,
Not mastered by some modern term,

confined its attention to the direct study of the actual physical phenomena of disordered health. Imbued with the traditions of the Dublin School, one could look back lingeringly on the clinical conquests of the old masters, before joining the modern leaders in the new crusade of experimental medicine. It was a veritable revolution, and with it came a natural reaction against the empiricism of the older time, which resulted in a nineteenth century revival of the Hippocratic school. The study of the natural history of disease was once more exalted by some to the highest place, and the function of therapeutics lowered to the so-called "expectant method." Fortunately, this modern revival of what had been called of old a mere meditation upon death (*θανάτου μελέτην*) had in its extreme form but a short success. There was not enough inspiration in a gospel that taught its disciples that a warm bed was the treatment for pneumonia, and that blankets and mint water were the remedies for the most painful of acute maladies. I said fortunately, because if this expectant school had long maintained its influence, it would have been disastrous to our art, which must always rest on exact diagnosis as the basis of honest treatment.

It is hardly too much to say that diagnosis itself would have in time become a superfluity to practitioners, who regarded a warm

bed as the simple and sole treatment for a pneumonia, a pleurisy, or a rheumatism. In our ranks, as in mankind generally, the aggressive courage that volunteers to advance on the terrors of the unknown is more common than the passive fortitude that stolidly endures evil. As Trousseau said, "It is better to walk in darkness than to stand still." The cynical confession by these modern Hippocratists of their impotence to grapple with developed disease and cut short its course roused the impatience with which disciples of the aggressive school have always refused the passive function of mere observation. The external forms of diseases and the laws which regulate their courses were already well, if not perfectly, known, and so students were stirred more and more in the face of teachings of therapeutic powerlessness to search with renewed energy into the causes which produced disordered health. The study of medicine became more and more the study of experimental Pathology, not the morbid anatomy that generated despair by its revelations of the ravages of unchecked disease, but that modern Pathology, which, armed with instruments of precision and methods of the minutest delicacy, has sought out the very beginnings of disease, and discovered new possibilities of final triumph. Thus, side by side with the teachings of Gull and his followers, grew the new school of experimental medicine. The time, too, was propitious. The physical sciences had reached a stage of their growth, when medicine could borrow their methods and relying no longer solely on observation could apply experiment and comparison to the solution of her problems. "To search out and study the secrets of nature by way of experiment," the great Harveian principle, was to bear fruit. Villemin, in 1865, startled the world by showing the inoculability of tubercle, and Sanderson repeated and confirmed his experiments. The work has gone on ever since till now, thanks to the brilliant labours of Koch, we can identify and isolate the bacillus of tubercle. The micro-organism has been cultivated and studied, till the evidence has become complete enough to satisfy most of the sceptics, that a tubercle is not merely a neoplasm of definite histological structure, but a neoplasm containing within it a specific bacillus. It would be difficult to exaggerate the value of this great conquest of experiment, which is dissipating day by day the mystery that has through the ages surrounded consumption. Like other similar discoveries hereafter to be referred to, its chief value at present is in the explanation it gives of the communicability of the disease, the conditions which favour its development, and the means to which we look for prevention, if not for cure.

Long before this, we had, in seeking an explanation of many infectious maladies, assumed that some sort of fermentative process went on in the system, and so we called them zymotic diseases. When the labours of Schwann had demonstrated that the act of fermentation was intimately connected with the multiplication of living yeast cells and the result of their life, a beginning was made for the germ theory of disease. The study of putrefactive processes and their intimate association with micro-organisms distributed in air, earth, and water was the next step. The doctrine of a contagium vivum as the cause of each specific disease received fresh support, and the vitalistic theory of fermentation, elaborately supported by Pasteur, led to the greatest of modern surgical triumphs in the treatment of wounds—a triumph which has added glory to British surgery and immortalised the name of our associate, Joseph Lister. The fermentative and putrefactive processes were, under the growing sense of their importance, investigated with wonderful patience and remarkable skill alike by those who held the vitalistic theory of their causation and those who defended chemical views. In the end the great chemical champion, Liebig, was dislodged by the experiments of Naegeli from a series of positions which he had defended with the greatest skill, and the presence of micro-organisms was generally accepted as essential to fermentation and putrefaction. The writings of Henle, nearly fifty years before, had foreshadowed the connection of infective diseases with micro-organisms, and a distinguished member of this Association, Dr. William Budd, of Bristol, had, in 1849, declared his belief that cholera and typhoid fever depended on living organisms. He, like many an ardent student, longed for and foresaw the day when, in connection with zymotic diseases, the initial phenomenon of the morbid series would be isolated and defined, as had been done in the case of parasitic diseases like tinea or scabies. That day was now at hand. The discovery of the bacillus of anthrax by Pöhlender, and the subsequent elucidation of its life and history by Davaine, Pasteur, Koch, and others, who proved it to be the actual cause of the malady, opened a new field of study. New and inge-

nious methods of investigation, new arts of studying the life-history and morphology of bacteria by cultivating them in nutrient media were devised; and inoculation experiments on animals revealed new and startling facts as to the nature and modifications of the virulence of micro-organisms, which led to the discovery of means by which they could be weakened at will and made protective against more potent forms.

Modern Medicine had been reproached by a great clinician, as tending to lose itself in the study of the infinitely little, but the infinitely little had now a noble revenge in creating a scientific basis for preventive medicine. Bacteriology became a special branch of science, armed with its own methods, worked by its own students—a special army corps equipped with search lights for exploring the positions and studying the tactics of the common enemy, disease. Relapsing fever yielded its secret cause, in the spirillum of Obermeier in 1872, while researches on the diseases of animals discovered bacilli as the causal agents of many of their ailments. The chicken cholera investigations of Pasteur were probably the most fruitful, for they first led him to the discovery of the method of attenuating the virus by the action of the air on his cultures of the microbe. The virulence was lessened while the morphological characters were retained. A strong or a harmless virus could be produced at will, and at a certain strength it formed a vaccine preventive of the original malady. Jenner's discovery had found a parallel, and the method of inoculation had gained extended application.

Similar methods applied to the study of the bacillus of anthrax led Dr. Greenfield, in this country, and Pasteur, in France, to the conclusion that its virus could be also attenuated by cultivation, and that inoculation of the attenuated form, while producing mild splenic fever, was protective against future attacks of the disease. In 1881 Pasteur publicly demonstrated the efficacy of these protective inoculations, and now every year hundreds of thousands of animals are successfully vaccinated against anthrax and saved infinite suffering, while man is less exposed to woolsorter's disease. There is yet another example, in a disorder affecting pigs, called in France "rouget," and in Ireland "red soldier," from the red patches that appear on the skin in fatal cases. This affection depends on a bacillus, and in studying it Pasteur devised a new method of attenuation. He inoculated rabbits with the virus, and discovered the remarkable fact that in passing through rabbits the energy of the virus increased for them, while it diminished for the pig; till at a certain point it became a protective vaccine for the swine. The genius of a French chemist thus opened out to our view, in these and other experiments, the far-reaching possibilities of preventing disease which the great Englishman began in the discovery of vaccination. The discovery of our day, however, by isolating the initial phenomenon of the morbid series, and showing us how we can modify and control its virulence at will, arms us with a knowledge that promises far wider results for prevention and cure.

In the dark ages chemistry had been nursed and nourished by medicine, and in our time the daughter science, by the application of experiment, had won its brilliant position. It was therefore a fitting return that medicine should owe to a great modern chemist the scientific methods which have resulted in the grandest findings of our time. In Pasteur's hands experiment and comparison have so widely extended the domain of pathology as regards man and animals, that we begin to realise the new kingdom of comparative pathology which the genius of Hunter foresaw and described.

'Tis time
New hopes should animate the world, new light
Should dawn from new revealings.

Pasteur's most difficult task, however, was the discovery of a prophylactic for hydrophobia. Working on the same lines, although he did not succeed in isolating the special microbe of rabies, he nevertheless found a means of modifying the virus, of shortening its incubative period, and inventing a system of inoculation which is protective against the dog bite. Hydrophobia is supposed by Pasteur to be due to a living contagious capable of multiplication and to a secondary poison or ferment, which is produced by the growth of the micro-organism in the system. Now there is a law widely applicable to most zymotic or pathogenic organisms, that the substances they produce become in the end destructive of their own development. The most familiar illustration is vinous fermentation, in which the alcohol formed checks the growth of the yeast fungus. Similar facts have been observed in connection with several pathogenic microbes. In

such cases the saturation of the system with the products of the microbe stops its multiplication, and in time renders it inert. If this theory be well founded, the effect of repeated inoculations of the chemical product is to introduce into the body, in the form of attenuated virus, enough of the product to prevent the fresh development of the original micro-organism. As I have said, this original micro-organism has not been isolated in the case of rabies. There is consequently a gap in our knowledge of the *modus operandi* of the virus in that instance, which leaves us in much the same position as we are with respect to vaccination and small-pox. Admitting this freely, we can still agree with a great authority in saying: "There is no stronger example of the power of the experimental method applied to medical matters than this one of the prevention of a malady, the absolute virus of which is still obscure."¹ Looking closely at this theory, which may explain Pasteur's success, we get a side light of startling suggestiveness as to the truth at the bottom of the old theory of the *vis medicatrix nature*, just as in the modifications in the intensity of the virus produced by cultivations we may recognise the truth underlying the change of type theory of disease.

In the most malignant infective or febrile disorders there is often such profound constitutional disturbance that some poison or ferment is suspected to be generated in the blood. This chemical side of the pathological inquiry has yet to be worked out, but already chemists have isolated from organic substances undergoing putrefaction complex compounds which possess most virulent properties. In some cases of septic disease these toxic products, there is reason to believe, are generated by the metabolism taking place between the bacteria and the tissues. Some of the latest researches lead us to think that a given bacillus will always produce identical metabolic products, and that some of these are the specific results of the particular bacterium, and cause the graver symptoms as, for instance, in diphtheria. It is not my object in these cursory references to bacteriological discovery to do more than indicate the direction of modern advance. Much as one would like to dwell on the experimental results obtained in other diseases, such as cholera, pneumonia, scarlatina, typhoid, and septic and suppurative conditions, I am obliged, by the limits of my time and the nature of my object, to refrain.

The position at which we have arrived may be briefly stated as follows. In some few diseases, such as anthrax and relapsing fever, we know a specific micro-organism to be the contagium. In a second group, such as tubercle and cholera, the evidence is nearly complete; while in a third group the position of the micro-organism as the cause of each malady is still *sub judice*. In scarlatina, for example, the existence of a specific germ has been warmly discussed by Klein and Crookshank. Edington claims to have found a bacillus, Klein and others describe a specific streptococcus. Fränkel and Freudenberg admit the streptococcus, but say it is not special to scarlatina, but identical with the streptococcus pyogenes, which is common to many septic and purulent conditions. So the matter rests, and we may leave it with confidence in the hands of such workers, to whom I ought to add the name of Dr. Crooke, of this town, the able Secretary of the Pathological Section, who has the honour to have been the first to observe and describe a streptococcus in scarlatina.

The lesson that these results teach us is that experiment and comparison have vastly changed our notions of disease, by substituting actual demonstrations of morbid processes for vague speculations. We no longer refer an epidemic to the anger of the gods, or to some intangible emanation, but we find its cause with the microscope and the culture flask. We identify and isolate the microbe, and that done, or even before it is done, we learn by experiments to modify and master its effects. "Shutting out fear with all the strength of hope," experimental medicine aims at discovering and controlling the starting-point of each infectious malady. In every instance in which that is accomplished the arts of prevention and cure hasten forward with hurrying feet, but with by no means equal steps. Bacteriology gives, in the first place, the strongest impulse to preventive medicine, by defining the cause, and in many cases giving the power to control and modify at will the initial phenomenon of each morbid series. With these revelations of the nature of pathological processes; with these disclosures of the causes of disease; with these demonstrations of what I may call the mechanism of maladies, is it any wonder that the attitude of the profession to disease is vastly changed?

¹ Croonian Lecture on Preventive Inoculation, by M. Roux, JOURNAL, June 8th, 1889.

The mystery that awed and paralysed us in so many cases 30 years ago has yielded its secret to patient study, and, confident in the new knowledge, we hail,

The teeming future
Glorious with visions of a full success.

It is now time to ask, How does this changed attitude affect the problem of medicine—that twofold problem, the preservation of health and the cure of disease? On the latter branch my distinguished colleague, Dr. Broadbent, will address you on Friday. To-day I want to direct your attention to the preservation of health by that prophylaxis which is the primary outcome of all those researches of which I have spoken. These revelations of the causes of disordered health make it increasingly possible for collective effort to be made successfully for prevention, where individual action is comparatively powerless. Influenced by this view, the State has legislated, as we shall see, more and more willingly as modern discovery has been able to suggest the methods and define the objects of preventive measures.

As long as medicine was a slave to the tyranny of theological ideas, or to the mastery of metaphysical explanations, little progress could be made. The shafts of the far-darting Apollo formed as hopeless an explanation of an epidemic as the possession by evil spirits taught down to mediæval times. From such notions nothing better could come than the pathetic isolation of the leper or the organised system of separation, called quarantine. The form of our knowledge was unscientific, and not fitted to lead to systematic prophylaxis. *There was nothing definite to aim at.* The individual practitioner was left alone to contend, as best he could, with the common foe, because science had as yet made no rules for collective action. All this is now altered by the advances made in the identification of the contagia of many maladies, and by intimate acquaintance with their modes of communication and with means suited to check their spread.

When the modern terror, in the shape of cholera, first came in 1831, legislative action could only begin tentatively. As Mead had suggested more than a century before, a Central Board of Health was appointed to organise common measures for the public safety. Necessity has been well called the mother of invention, and in the same sense we may well call panic the parent of sanitation. Each invasion or threatened invasion has generated fresh legislative activity. At such times the public mind, stirred by fear, has greedily called for the help of the profession, and consequently there has been produced, with every one of the five cholera alarms, legislation to protect the public health. It was not, however, till the present reign that any systematic recognition of State medicine was made.

On the accession of Her Gracious Majesty, the statute book was practically innocent of sanitary law, except the Quarantine Act. That many Acts have since been added, future historians will regard as one of the greatest glories of the Victorian era. The evolution of this legislation, slow at first, has proceeded more and more rapidly as medical science has created for it an intelligible basis. The movement began in 1842, when the late Sir Edwin Chadwick, who was the father of modern sanitary reforms, startled the world by a memorable report on "The Sanitary Condition of the Labouring Population of Great Britain." The Royal Commission which was appointed in consequence we may regard as the starting point of State interest in public health. Once begun, the progressive movement, though often checked, has never been lost. The public responsibility for the unhealthy conditions in which the population lived was acknowledged once for all, and in 1847 Liverpool, to its honour, appointed the first medical officer of health in the United Kingdom. In the next year, London followed with a similar appointment, destined to be of national importance, for it gave to the service of his country the great veteran of sanitary work, Sir John Simon.² Another epidemic of cholera now occurred, and a General Board of Health was established by Parliament for five years. It was in this epidemic of 1848-49 that Dr. Snow began those inquiries which led to the discovery that the intestinal discharges of cholera patients were the means of spreading the disease. The contamination of the water supply by this means was, in the epidemic of 1853 and 1854, again shown to be the explanation of what had been till then the mystery of the distribution of the pest. This famous

discovery marks the first stage in the evolution of modern sanitation. The darkness that had so long concealed the modes of conveyance of certain infectious diseases commenced to clear, and in sewage-tainted water was recognised the actual physical evil that accounted for the spread and persistence of many of the so-called filth diseases. There was now something definite to aim at. Purity of water supply and efficiency of drainage became objects for which sanitarians and legislators could work together.

The General Board of Health appointed in 1848 was renewed in 1854 in a different form, and was continued year by year by renewal Acts till 1858. It is a melancholy reflection that, in spite of the important additions made at this time to our knowledge of the circumstances favouring the spread of epidemics, the Legislature should have still been so blind to responsibility as to regard a department of public health as a temporary expedient. Even in 1858, when the duties of the Board of Health were transferred to the Privy Council by the Public Health Act of the year, Parliament was either so indifferent to, or so ignorant of, the importance of the Act, that it was passed for one year only. Happily the absurdity was recognised in 1853, and a perpetuating measure enacted.

The Legislature had recognised at last, that the care of the public health was a part of its continuous duty, not a task to be taken up in a season of panic, and afterwards laid aside till trouble knocked again at our doors. This was due in great measure to the influence of Simon, who had been acting for some years previously as medical officer to the General Board of Health, and by his great administrative ability and organising power had created a scientific basis for sanitary work.

The late Dr. Headlam Greenhow, one of those who worked with him, began at this time a most important statistical inquiry into the different proportions of death caused by certain diseases in different districts in England. The Registrar-General's returns had hitherto not told more than the general death-rates, and consequently it was impossible to study with the necessary precision the particular prevalence of particular diseases in particular districts. In his report to the Board of Health for the year 1858, Simon admirably enforced the lesson of this inquiry by showing, that the prevalence of many maladies specially affecting certain localities or particular classes of the population was due to the existence of controllable conditions, which special medical investigation by the central authority could discover and correct. This was an unanswerable argument for creating a permanent central health authority to exercise continuous supervision for sanitary ends. The recognition by the State of its duty of maintaining permanently a department of health thus coincides with the next stage of sanitary evolution. There was now added, to the general duty of maintaining purity of water supply and effective drainage, sure statistical evidence of the greater prevalence of disease in the localities in which these essentials were most defective.

During the next few years the health department of the Privy Council carefully studied, by a system of special inspection, the local distributions of disease, the food supply, the housing, the local physical conditions, and the industrial circumstances of the people, for the purpose of building up a knowledge of the primary essentials of public health. In this work many distinguished members of this Association individually took part, and the public interest in sanitary progress was thoroughly kept alive by the striking lessons drawn from vital statistics by which the late Dr. Farr illustrated his invaluable reports. This Association honoured itself, when it bestowed on him its highest honours in recognition of these labours for the public good.

In 1865-66 another cholera alarm intensified the public concern in health matters, and the Sanitary Act of 1866 made it the duty of local authorities to provide for the healthiness of their districts. Thus at last was won the long-delayed recognition of the great principle that the care of the public health is a chief duty of local government. There were at this time in this Association, a number of men, who had for many years paid great attention to State medicine, and who had, some of them, from the beginning maintained the principle laid down by Sir Charles Hastings in 1832,³ that one of the chief objects of the Association was the

² In his recently-published work, *English Sanitary Institutions*, Sir John Simon has given the world a most exhaustive and eloquent history of modern sanitary progress. I gladly acknowledge the valuable help it has been to me in writing this address.

³ The original prospectus of this association, in stating its principal objects, laid this down in clear terms as follows: "Investigation of the modifications of endemic and epidemic diseases, in different situations and at various periods, so as to trace, so far as the present imperfect state of the art will permit, their connection with peculiarities of soil and climate, or with the localities, habits, and occupations of the people."

study of public health. Two of the foremost and most honoured of these, now no longer with us, were Dr. A. P. Stewart and Dr. Rumsey. Mainly in virtue of their action a Committee on State Medicine was appointed at Dublin in 1867, to act conjointly with a similar committee of the Social Science Association. If the prudent counsels of this joint committee had been followed, much of the legislation of later years would have been anticipated and many of the errors of 1871 and 1872 avoided. One of the first results to follow was the nomination of the Royal Commission of 1868. The report of that Commission recommended the universal appointment of medical officers of health, and led to the concentration in one department—the Local Government Board—of nearly all the relations of the central government with the health of the people.

The great Public Health Act of 1872 embodied some of the recommendations of the Royal Commissioners, and provided for the universal appointment of medical officers of health, and the complete sanitary organisation of the kingdom. This Act created our modern position, and although it has proved disappointing in its working, it remains a monument of the wise constructive statesmanship of its author, Mr. Stansfeld. A return made the next year showed that out of 1,468 sanitary districts, over 1,100 had appointed medical officers of health. As regards the recognition of the office, and the establishment of a universal connection between the duties of the State as regards public health and the medical profession, this was a gratifying contrast with the single medical officer of health in the United Kingdom in 1847. On paper it seemed a result almost good enough for a quarter of a century's work. It was, however, not so satisfactory on analysis of the return, to find that in spite of the encouragement given by the Local Government Board to the appointment of officers for large joint areas, only fifty-eight of the appointments required complete devotion to sanitary duties, and that in hundreds of cases there was only a nominal compliance with the Act. Although the Government estimates for the year 1873 and 1874 voted £100,000 to the part payment of sanitary officials, hundreds of local authorities declined the aid, and selected independence and inefficiency in preference to greater central control. The Act contained, however, as we can now see, the causes of its failure. In the first place it had attempted too much. The sudden and universal appointment of medical officers of health was more than the public intelligence was ready for, particularly in the smaller rural districts by which the appointments were allowed to be made. The Act, moreover, did not contain the powers by which the central authority could remedy defective local action, and advise with commanding authority the petty boards that preferred independence to efficiency; and lastly it made the great mistake of making the sanitary work of local authorities a *secondary*, instead of a *primary* duty. In spite of these defects, the local authorities might have been taught that the highest function of local government is the care of the public health, if the central authority had exercised systematic and frequent supervision of local work.

It is mainly because this has not been done, that we have at the present time both rural and urban districts in this country that in a sanitary sense are a disgrace to civilisation. In 1883, when a cholera alarm once more excited official activity, the Local Government Board started a systematic survey of the country. It was carried on for two or three years and then dropped, when it had discovered, in the great irregularities of sanitary efficiency, the strongest arguments for its continuance. Some local authorities were described as earnest, others as indifferent and careless, and the apathy was greatest, as a rule, where poverty most afflicted the people and rendered them least capable of self-help. But, perhaps, the strongest argument for such a system of continuous inspection is to be found in the help it gives to zealous health officials, and to earnest sanitary authorities. Such inspection wisely used becomes a great promoter of efficiency by encouraging localities to avail themselves of every new scientific advance. That local authorities daily become more willing to do this cannot be doubted, when one looks over the country and observes, how, in the last few years, sanitary authorities have freely spent money in meeting the modern demand for the isolation of infectious cases. The system of isolation in special hospitals is the last great step in the evolution of public prophylaxis, and is a striking testimony to the influence of modern discoveries as to the nature of contagion.

Parliament has also shown by the Acts which it has passed during the last three years that it is more than ever alive to sanitary progress. The improvements in the qualifications and position of

medical officers of health, and the provisions embodied in the Local Government Acts of England and Scotland by which county councils in the future, advised by skilled medical experts, will superintend and protect the health of large areas, are satisfactory evidence of this, and none the less satisfactory because they realise recommendations made years ago by committees of this Association. The measure passed last year for the Notification of Infectious diseases is also a most important step towards that national registration of sickness which our associates, Dr. Rumsey and Dr. Ransome, so long and so ably advocated.⁴

We can freely acknowledge our debt to the President and the Parliamentary Secretary of the Local Government Board, for these valuable enactments, and also for the help they gave to the Infectious Diseases Prevention Bill of this year, which places dairies under medical inspection and will help to check the spread of many diseases conveyed by milk. It is a portent of great significance that measures, which a few years ago would have raised a wide and wild outcry in defence of the liberty of the subject, should now pass almost unopposed. It shows how strongly modern discoveries as to the nature and mode of propagation of infective disorders have captivated the public imagination. While the profession could only speak in general terms of filth diseases, explain their distribution by noxious emanations and miasmata, and rely on purity of water and drainage as the only preventive measures, progress was necessarily slow. Since our knowledge of the intimate nature of contagia has developed, isolation has been accepted as a public duty and provided for at the public expense. The stamping out of scarlatina and small-pox, for example, has become a charge upon the rates. The discovery that preventable or infectious diseases are communicated by solid particles of living matter, by specific micro-organisms which never arise spontaneously but always from pre-existing organisms, each forming the specific virus of a particular malady—has given a directness and precision to preventive medicine which has won it popular favour. The relation of these pathogenic microbes to food, earth, air, and water offers the most fruitful inquiry for the public health that medicine has ever begun. The popular intelligence watches the work with the greatest interest and sympathy, because it has understood the meaning of modern methods of inquiry and prevention, and realised that success depends on co-operation between the State and the profession.

It is on this willing co-operation of public representative bodies throughout the country, that we base our hopes of sanitary progress. The day, I hope, is not far distant when that department of the Local Government Board, for auxiliary scientific investigations—instituted with such wise foresight by Simon, and carried on so ably by his successor, Dr. Buchanan—will be voted thousands instead of hundreds for its important work. Years ago it enriched the literature of preventive medicine by the labours of Sanderson, Creighton, Thudichum, and Klein. Of late it has well maintained its character by the original work of brilliant experimentalists, one of the ablest of whom, Dr. Wooldridge, we lately lost. It is not too much to hope, that one day the nation, out of the superfluity of its wealth, will adequately endow a department for researches which bear so directly on the health and wellbeing of the richest as well as the poorest of her citizens. It is by such a department—adequately endowed—working in connection with a staff of medical inspectors, supervising the work of medical officers of health, able to devote their whole time to their duties, that the administration of public health will be finally perfected. We are still unhappily far from this condition. I find that this year there are in England and Wales 1,545 medical officers of health, receiving annually nearly £100,000, but of these only 101, or less than 1 in 15, are health experts, in the sense of being free from practice and solely engaged in sanitary work. There is, therefore, much to be accomplished. It cannot be long deferred, for the duties of a health officer must daily grow more specialised, and when he becomes a recognised specialist, and not a competitor in practice, his work will receive more and more assistance from the profession. His aims and methods can never be a matter of indifference to the great body of the profession, for he should be the useful ally of the practitioner, on whose knowledge and discernment in individual cases he must always depend. The practitioner will necessarily be the first to discover and re-

⁴ The wide voluntary adoption of this Act is most noteworthy. It came into force on August 30th, 1889, and early in July this year it had been adopted in 836 sanitary districts outside the metropolis (where notification was in force without adoption), and had been applied to about three-fourths of the population of England and Wales.

cognise preventable disease, and the function of the health officer will be to support and complete his action.

Thus the relations between the State, the health officer, and the practitioner will grow closer as our organisation is completed in that single-minded co-operation for the public safety which science and humanity alike demand. The relations, as they develop, will need for some time to come, however, the most watchful care. It is fortunate that this Association has, in its Parliamentary Bills Committee and its able chairman, a representative body, admirably fitted to safeguard medical interests and to speak with unequalled authority for the profession. The British Medical Association has borne so important a part in fashioning legislation in the past that I doubt not it will have an increasingly honourable share in perfecting such work in the future.

It seemed to me that if it was excusable anywhere to speak in this address on these topics, Birmingham was the place. Here the Social Science Association began its life under the presidency of Lord Brougham, and amid the congenial surroundings of a population eager for social reforms. Here, too, that Association closed a distinguished career, after having taken a noble part in winning the legislative advances to which I have referred.

In Birmingham, moreover, we have a striking example of a community which has always given special consideration to social questions, and by virtue of this quality has formed a high ideal of local government. The title of the "best governed city," given to the town by a recent American visitor, shows that high aims have led to high success. When the Association last visited this town in 1872, Mr. Joseph Chamberlain and his colleagues were just beginning the memorable enterprise of remodelling the municipal government, which has resulted so happily in the transformed aspect of the city. The transformation is not limited to the surface: it has penetrated deeply into the lives and homes of the people, and has given the world an example of how a great self-governing community, by the loyal co-operation of its citizens from the poorest to the richest, can increase intelligence, cultivate taste, elevate morality, and purify the physical conditions of life. In the free libraries, in the schools—elementary, art, and technical—in the parks, and in the improvement area which once constituted the slums, there is evidence of the results of the modern spirit of municipal work. In no department has this work been done more efficiently than by the Health Committee. The results are shown in a death-rate which has fallen from 26.6 per 1,000—the average of the twenty years ending 1870—to 23.5 for the ten years ending 1880, and 19.6 for the nine years ending 1889. Thus, while the population has grown in numbers during the last twenty years by about one-third, the annual general death-rate has lessened by 7 per 1,000, or by more than one-fourth. The zymotic deaths have fallen in the same time from over 7 per 1,000 to less than 3. In those parts which now form the improvement area, and which once were slums, the death-rate has fallen from over 50 to less than half, or 23.1 per 1,000. These figures tell more eloquently than words how the wise expenditure of public money comes back after not many days in the lessened sorrow and suffering of the population.

The question, Am I my brother's keeper? has been answered in Birmingham in a spirit of true fraternity. The sympathy for misery, which has shaped so much of the national legislation in recent years, has found in this city one of its noblest monuments. Like other towns, we have hospitals and charities of which we are proud, but we have also one of the most perfect Poor-law infirmaries which this kingdom has yet seen. Everyone will, I hope, visit the noble hospital, which has been erected at a cost of over £100,000 as a refuge for sick paupers. A workhouse hospital does not usually connote beauty and comfort, but in the Birmingham Workhouse Infirmary of to-day, both are present. Splendid and spacious corridors connect thirteen blocks of wards, each block the size of a recognised clinical hospital. In the wards you will find the patients bedded amid bright and cheerful surroundings, that would do credit to any of the great institutions of the metropolis. Everything that science and art can contribute for their relief is supplied, well-trained, cultivated ladies serve as their nurses, and two of our most able colleagues act as visiting physician and surgeon.

Go and see, I ask you, how Birmingham takes care of its 1,500 sick poor, and you will, I am sure, appreciate the wise benevolence that has raised this great medical monument of Christian charity. There is, to my mind, only one defect: every one who is admitted is forced to become a pauper. I hope one day sickness and suffering will be sufficient passport, and that the benevolence

which proffers the relief will not mar the sweetness of the gift by a condition which embitters its receipt. When that day comes, and the collective provision for the sick is made a public duty, many hospital abuses will be cured by the municipalisation of our charities. The isolation of infectious cases has already been put upon the rates without entailing pauperism, and our City Hospital contains some 400 beds. Thus these two rate-aided hospitals receive some 2,000 patients, or between three and four times as many as are maintained in voluntary hospitals. In London a similar condition exists, for there nearly two-thirds of the 18,000 in-patients are supported from public funds!

Some of you may say I began this address with philosophy and I end it at a workhouse—a goal which philosophy sometimes attains. I accept the criticism. It states a truth and conveys a lesson. It is that lesson which I wish to impress upon my professional brethren—the immeasurable importance of even their highest scientific work to the well-being of the poor, and through that to the stability and prosperity of the State. We have in our ranks some 4,500 Poor-law medical officers, who are the daily bearers of succour to suffering thousands, and in many cases the only visible link between the rich and powerful State and the homeless and hopeless poor. In the daily work of these 4,500 doctors there reside greater potentialities for social progress than in any other class. To them is given the highest function committed to us by the Highest—the care of the suffering poor—and in the daily discharge of that holy task, the vast hecatomb of human misery that civilisation piles up may be diminished and prevented. If it is not so prevented, decay will come upon us as a nation; for never yet have strength and stability been found in hoarded wealth, but only in the content and comfort of the poorest classes of the population. I want every parish surgeon, every practitioner among the poor—and thank God we all have poor patients—and every medical officer of health, to realise the nobility of the service he gives the State; and one day, I hope no distant day, the State will awaken to the value of such service, and recognise in the trusty dispenser of a nation's charity, or the wise saviour of a city's health, servants of the State more worthy of its honours than the successful soldier, or the astute diplomatist.

But come this higher hierarchy of worldly honour soon or late, to men who do their duty in our ranks, there will come one day the grandest words of welcome and reward, "Well done, thou good and faithful servant; enter thou into the joy of thy Lord."

ADDRESS IN SURGERY,

BY

LAWSON TAIT, F.R.C.S.,

President of Mason College, Birmingham.

SURGICAL TRAINING, SURGICAL PRACTICE, SURGICAL RESULTS.

Modern Biological Training of Medical Students.—What is its Practical Value?—Bodily.—The Modern Assistant—The Advantages of the Apprenticeship System.—How to Saw and how to Hammer.—The Handicraft of Surgery.—The Anæsthetic Revolution.—The Change in Surgical Methods and the Extension of Surgical Possibilities.—The Growth of Specialism in Surgery.—The Advantages it has Conferred on the Public and on the Profession.—The Need for More Exact and Uniform Records of Results.—Fashions in Surgery and Medicine.

MR. PRESIDENT AND GENTLEMEN,—I do not know that there is any position in which one who practises the handicraft of surgery could feel a more weighty responsibility than that which I now occupy, and if responsibility is the best measure of dignity, I frankly acknowledge that there is no position in the whole wide world that could by any possibility be conferred on me which I should regard as a higher honour than that which I am about to try to fill worthily in addressing this great Association on the subject and object of my daily life. Your corporation now is but a short name for the profession and practice of medicine and surgery throughout the English-speaking world, and that means our globular part of the universe. There is no need for me to offer an