BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 7 1951

MEDICINE, YESTERDAY AND TO-MORROW*

BY

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I suppose that it would be difficult to justify on grounds of mere reason the instinct which prompts us to find some special significance in the beginning or the end of a century, or of one of its simpler fractions. We must all be conscious, however, of a strong impulse to indulge, upon such occasions, in audits and forecasts, to look backwards and forwards, "to paint the future from the past." And I am only too well aware that this tendency to reminiscence and prediction, felt by the majority at these rather long intervals, is apt to become a tiresome addiction, a disease of occupation, or perhaps I ought to say of retirement, in those of us who have entered life's later years. I cannot, therefore, ignore the fact that I myself, on more than one recent occasion, have already written and even lectured about changes and prospects in medicine, in that reminiscent vein.

And now I find myself yielding once again to persuasion, and undertaking to address yet another audience on "Medicine, Yesterday and To-morrow." I can only plead, in extenuation, that I was concerned last year with the ending of a half-century, and that now I am asked to commemorate the ending of a whole one, in connexion with the Festival of Britain; and, further, that I have addressed my earlier surveys to wholly medical audiences, whereas I have been told to expect the presence of some to-day who, though they must be credited with a lively interest in the progress and the achievements of medicine, past and prospective, have not been trained to familiarity with its technical details or with the obscurer ranges of its terminology—the language in which we medical men try to hide our mysteries from the laity, and sometimes, perhaps, our ignorance from ourselves. I shall try, then, to show you my picture of "Medicine, Yesterday and To-morrow" in broad and simple outlines, and to lapse as seldom as may be into the special dialect of the wards and the laboratories. You will have in mind, of course, the link between this lecture and the Festival of Britain, which must be held to extend the "yesterday" of which I speak as far back as 100 years ago; "to-morrow," on the other hand, may stand for only so much of the future as we may judge to lie within the limits of sane prediction.

Men of Vision

Albert, the Prince Consort, with the group of his distinguished advisers, and the Great Exhibition which

they had planned with him 100 years ago, stand for us as symbols of that expectant age. They seem to have had a vision of mankind being led by science and the arts to new heights of material prosperity, of wide channels of commerce opened between the nations, and of a spirit of friendly rivalry aroused among all the peoples of the world. Evidence of these generous aspirations can be found in the plans which soon took shape in their hands, and are still effective, for applying the large earnings of their exhibition to the further promotion of science and the arts. We picture them thus watching the dawn of that scientific era of civilization in which we are still living; and we may surmise that, if they could see what has come of their vision, their reactions would be of amazement at seeing advances in many directions so far beyond any which they could have imagined, or even understood, and of sad disillusionment at finding us still so far from any certain prospect of the perpetual peace which they had believed that their enterprise would help to inaugurate—"the thousand years of peace" which the poet of their era, Alfred Tennyson, had so confidently bidden the bells to ring in at the new year.

And as we think of these men of vision, foreseeing thus early what the practical uses of science might be able to do for mankind, it seems the more remarkable to find so little evidence in their day of any comparable movement in medicine. Did the Prince and his advisers, one wonders, have any prevision of the transformation which science was to produce, in much later years, over the whole range of medical thought and practice? It does not seem likely; there was little enough then, indeed, to encourage any such prediction. For I think that we must admit that by 1851 medicine had shown remarkably little real progress even for several hundred years. The world, and our own country indeed, had produced at rather wide intervals great men of medicine who were also great men of experimental science; we had had William Harvey in the seventeenth century and John Hunter in the eighteenth. And when Edward Jenner made his empirical discovery of vaccination at the end of the eighteenth century he had unwittingly sown seeds, long to remain dormant, of our modern knowledge of immunity and of the viruses. Some of the discoveries of such men had been absorbed into the routine of medical practice; but they had achieved remarkably little yet towards the establishment of the progressive experimental tradition in medicine which was to have its real beginning and growth only much later, in times which most of us can remember.

Let us glance a little more closely at the state of medical and surgical knowledge in 1851. Anaesthesia was

*Lecture in connexion with the Festival programme organized jointly by the British Medical Association and the Royal Society of Medicine, delivered on June 20, 1951, in the Great Hall, B.M.A. House.

then still something of a novelty. Ether had first been given for an operation in Boston, Mass., in 1846, and Simpson had put forward chloroform as a more potent anaesthetic agent in the following year. The use of chloroform in childbirth, with which Simpson had been largely concerned, was still not accepted without protest on moral and religious grounds; and it was something of a triumph for its advocates when chloroform was first given to Queen Victoria in 1853 in one of her confinements. We ought further to remember, I think, that Morton's first public use of ether in surgery, of which the centenary was celebrated in Boston five years ago, was really the adoption in practice of recommendations which had been made from outside the medical pale by our own great discoverers, Davy and Faraday, 46 and 28 years earlier.

We may think, in any case, of anaesthesia, though still of a relatively crude type, as already available in 1851 for surgeons who had the enterprise to use it; so that patients in increasing numbers could already be relieved from the immediate pain of such operations as were yet regarded as justifiable. The range of these was still kept small, however, and the outcome of those performed was rendered very doubtful, by the septic complications which were still regarded then as a natural and practically inevitable consequence. We must remember that the discoveries of Louis Pasteur were then still in the future, and that it was not till 1865 that Lister's application of them to surgery began to reveal the infection of wounds by bacteria as the cause of suppuration and sepsis, and thus to provide one of the conditions for all the further progress of surgery.

Dawning Interest in Hygiene

And, of course, there was no more knowledge in 1851 of the real nature of infectious diseases of any kind. A little earlier Edwin Chadwick and Southwood Smith had begun, in the face of much opposition, to stir the public conscience about matters of simple, common decency in hygiene. John Simon, who was eventually to become the first medical adviser to the Privy Council and then to the Local Government Board, had been appointed Medical Officer to the City of London in 1848. The reports which he promptly began to issue on the sanitary scandals of the city will always hold a special place among official documents, for their brilliant candour and their arresting eloquence. Simon was an acute observer and a powerful advocate. Another pioneer in that line, John Snow, traced an epidemic to the drinking of water from a particular pump, and even stopped it by having the handle removed; but neither of these knew anything, or could yet know anything, of the bacteria which made the water infective, and which, indeed, were only beginning to be separately identified more than 30 years later.

Typhoid was endemic here, of course, then and long afterwards, and cholera still swept across Europe in epidemics every 10 years or less from its endemic centre in Asia; but few thought of any human agency as able to avert these dangers. My own father used to recall, from his boyhood, the cholera epidemic of 1854, and how men were then talking of the sensation created by John Bright when, speaking of its coming, he had laid a hush of fear upon the House of Commons: "The Angel of Death," he had told them, "is abroad in the land. You can almost hear the beating of his wings." But Bright, with his Quaker eloquence, aroused no

thought of resistance to the peril by means other than prayer and nursing.

We get a vivid impression of the helplessness of medical ignorance in dealing with such infectious diseases, not only in 1851, but for at least two following decades, when we recall that Albert, the Prince Consort, himself died of typhoid fever in 1861, at the age of 42, when he had only begun to give earnest of all that he might have done for this country, for Europe, and for the world; and that his eldest son, later King Edward VII, nearly died of the same disease in 1871, so that we only just escaped the further loss of all that he lived to achieve, with his very different and more readily popular gifts. Think of the outcry, of the fury of investigation, which would be aroused to-day by such a succession of hygienic catastrophes occurring to members of any of the world's ruling families or circles or, indeed, to any person well known to the public and the Press; how the experts, armed with all the latest devices for screening and testing, would swoop on every item of the food and water supplies, and on every potential human carrier in the entourage! And, if the search was not quickly successful, what an agitation would now arise for the immediate promotion of research on the problem! The thought of their late President, Franklin Roosevelt, crippled in his vigorous young manhood by poliomyelitis, has made such an emotional appeal to the citizens of the U.S.A. that funds for the support of research on that one disease have flowed there in almost embarrassing abundance.

The outstanding difference between then and now is that, in 1851, 1861, 1871, and even later, nobody had yet thought that research might discover the cause of such a disease as typhoid fever and ways of dealing with it—the way to cut off the cause of it at the source, or, if this should not succeed, to protect the individual by giving him an artificial resistance; or, again, if this should for any reason be lacking, to deal directly with the infection in the patient. We have now the knowledge and the means for effective action with various diseases at all these stages; but there was nothing then even to foreshadow what was to come. The work of Pasteur was needed, of course, before it could begin, and that of Robert Koch, and of the great army of their followers to carry it forward.

Preventive and Other Medication

Eberth discovered the typhoid bacillus nearly 30 years after the Great Exhibition, in 1880; its identification was fully established by the middle of that decade, and protective inoculation with a suspension of the dead bacilli was introduced by Almroth Wright towards the end of the century, though not in time for such a novelty to have any important effect on the disastrous prevalence of typhoid fever in the Boer War. We were well into the present century before the part played by healthy carriers of pathogenic bacteria in the spread of this and other infections was clearly recognized; and it is only much later again, in the past few years indeed, that there has at last been definite promise, with the discovery of some of the more recent antibiotics, of a direct and effective treatment of the typhoid infection, in a patient who, in spite of all preventive precautions, has already been attacked.

Mention of such curative medication brings a reminder that we have still to look at the position of medicinal treatment in 1851. We have seen how few were the

possibilities of surgical operation at that time, and it can be said without hesitation that the really effective medicinal treatments then available for the physician to prescribe were at best no more numerous. There were a few specifically active medicines which had been handed down from earlier centuries—mercury, which had been used since the end of the fifteenth century, cinchona and ipecacuanha, brought from South America in the seventeenth century, and digitalis, introduced by Withering's famous book, *An Account of the Fox-glove*, in 1785. These and a few others have survived even to the present day, as have also some of the drastic purgatives; these last, though rarely given now, having played a very prominent part in the practice of those physicians who favoured what was called a "reducing" treatment.

But, while there were then already a few drugs in use which had genuine activity, the true nature of the actions even of these, and the proper methods of using them, have been revealed only by much later advances of knowledge; others, as we have seen, were then given in a dosage so heroic as to be injurious rather than remedial. On the other hand, a large proportion of the drugs and medicaments used in those early days had actions vaguely defined and doubtfully existent. Medicinal treatment, in fact, was hardly ever given then with any idea that it could suppress or remove the cause of a disease. The usual aim was rather to build up the strength of the patient, or to weaken a supposed excess of his reaction, or otherwise to ease his symptoms by actions vaguely conceived and described as tonic, or relaxing, or sedative, or even alterative, and, frankly, to leave the essential cure to the *vis medicatrix naturae*.

It is not, of course, to be suggested that such symptomatic treatment had never any value, or that it has none even now: until a fuller knowledge can provide a remedy which can be shown to deal directly with the cause of an ailment, it is a plain duty of the physician to give any treatment which may be expected to maintain the patient's strength, to keep him comfortable and confident, and thus to leave nature with as free a hand as possible to eliminate the cause and effect the cure. We cannot, on the other hand, ignore the wide opening which a medicinal treatment with no other objective than this offered to self-delusion, oracular posturing, and benevolent humbug. It cannot be doubted, I think, that the prevalence of this attitude in the middle years of the nineteenth century, and later, brought medicinal treatment into low repute with the less easily credulous among the patients upon whom it was practised, as well as with the candid and critical among the physicians themselves. There was but little change in this situation, indeed, till after the end of the nineteenth century, and we owe the newer types of treatment, dealing in various ways but always directly with the different causes of disease, almost entirely to the advances of knowledge which have been made since the present century began, and very largely in its few most recent decades.

In turning now to consider some of the remarkable transformations which this and, indeed, almost every other aspect of medical knowledge and practice have since undergone, and largely in our own times, I must be careful not to imply that every kind of progressive activity in medicine was in complete abeyance 100 years ago. A few medical discoveries of major importance were then being made, as they are still, though at rather

wide intervals, by the patient study of conditions which could be observed and characterized in the patient during life and of the regular association of these with changes found in the different organs after death. The advancement of knowledge by this slow, patient method, which waits for Nature to perform her ruthless experiments and to present the results for our study, was indeed one of the special glories of medicine in those middle years of the nineteenth century; and we can proudly claim that in men like Richard Bright, Thomas Addison, and others we had British exponents of this method as great in their achievement as any whom the world has at any time produced.

Beginnings of Modern Endocrinology

Let us choose, then, for particular mention and centenary celebration the first publication by Thomas Addison, in 1849, of a note on his discovery by such methods of the condition caused by degenerative disease of the suprarenal capsules, which is now known as Addison's disease; and his further publication in 1855, in a slender quarto pamphlet, of classically complete descriptions not only of this disease but, incidentally, of another and entirely different one which we now know as pernicious or Addison's anaemia. And I choose these two modest but remarkably perfect publications by Addison, not long before and not long after the year of the Great Exhibition, because I think that we can properly find in them the real starting point for the developments leading eventually to all our modern knowledge of the significance of the ductless glands, modern endocrinology, with all that it has meant for the recognition and treatment, in our own day, of so many conditions now known to be due to endocrine deficiencies.

This is not the occasion for more than a hasty glance at outstanding events in that remarkable chapter of medical history. Against a background of laboratory researches, on lines for which Addison's discovery 40 years earlier had thus supplied the initiating stimulus, Murray, in Newcastle in 1891, first successfully treated an endocrine deficiency, myxoedema, with thyroid gland; and this was not only the first clinical application of endocrinology, but a very early example, at least, of the direct application, in treating the cause of a disease, of a discovery made largely in the experimental laboratories. Then, after another 30 years' interval filled largely with discouragement and frustration, came Banting and Best's discovery of insulin, and therewith not only health and efficiency for the previously doomed victims of diabetes, but a new spirit of optimism and enterprise in exploring other practical possibilities of endocrinology.

So before long we saw Addison's pernicious anaemia also yield at last to treatment with liver substance and extracts; and recently came the isolation of the active principle deficient in that disease and its recognition as a complex organic compound containing cobalt. Extracts containing hormones of the parathyroid gland and of the suprarenal cortex were prepared and brought into use, and a whole series of hormones from the anterior lobe of the pituitary body and from the sex glands, several from the latter being isolated and even made by artificial synthesis. And, more recently again, we have had the identification and preparation by synthesis of a range of pure hormones of different actions from the organ which Addison was studying 100 years ago, when he observed the progressive and fatal disease which was always associated with its degeneration—the cortex

of the suprarenal capsules. And now we have the therapeutic applications of some of these cortical hormones and, alternatively, of a hormone from the anterior pituitary lobe which stimulates the suprarenal cortex to secrete them. And this treatment of rheumatoid conditions, and of others which seem in general to be due perhaps to excess, or to perversion of the protective reactions with which the healthy tissues normally respond to various kinds of injury—these uses of the suprarenal hormone cortisone and of the corticotrophic pituitary hormone are already so full of beneficent promise that even now they are exciting immense interest and impatient eagerness for further knowledge of their uses and their limitations, not only among medical men but in much wider circles.

Progress in Anaesthesia

To take another example, I spoke of anaesthesia with ether and chloform as still a novelty in 1851; and it is remarkable, in retrospect, to note that there was hardly any progress in this important service to surgery and obstetrics, apart from minor improvements in details of administration, till well into the present century. When I entered hospital as a student in 1900 the standard technique was still a fold of lint over the patient's face, on to which chloroform was delivered, drop by drop, as needed. It seems to me now, however, that there is no department of medical activity in which improvement has recently been more rapid and dramatic than in this of anaesthesia, mainly during the past two decades, and especially, indeed, in the more recent of these. Anybody who has had personal experience of anaesthesia for an important operation 20 or 30 years ago, and again in quite recent years, could tell of the magnitude of the change. Pharmacology and synthetic chemistry have been called in aid, together with experimental physiology, which in 1851 had only just entered upon its modern period of rapid development in Europe, from which it spread to Britain some 20 years later. So that now we have basal anaesthetics to prepare the way for those of deeper effect; curarine from the South American arrow-poison, bugbear of the Victorian sentimentalists but now beneficently used, with a growing range of synthetic substitutes, to cause muscular relaxation and so to reduce the dosage and increase the safety of the essential anaesthetic; and, most recently, synthetic substances which, by their action on sympathetic ganglia, lower the arterial blood pressure and enable a postural adjustment of the patient to produce a practically bloodless field of operation. Advances such as these clearly contribute to the amazing achievements of modern surgery in dealing with the brain, the lungs, and now even with the heart, its valves and its great vessels.

Radiology

An entirely new gift to the resources of surgery first, and then equally to those of medicine, was made by the discovery of x rays in 1895 and then of radioactivity in 1896. These discoveries opened up, indeed, an immense and still expanding range of new knowledge to physics, the boundaries of which, as even I can remember, had till then appeared to have been so finally fixed and determined. And I think that we may find an early sign of the great change, which was then still to come, in the relation between practical medicine and the experimental sciences—a first break, as it were, in the high hedge which had so long been maintained between the two—in the impulse, which was almost immediately manifest, to put these new physical discoveries to medical

uses. And that impulse has lasted till to-day, when in making more widely available the newest resources of atomic physics, whether in machines or in radioactive isotopes, the needs of medicine, whether for diagnosis, treatment, or progressive research, are being given a high priority as a matter of course.

Immunology

The effects on medicine of the coming and the development of bacteriology, and of its offshoots dealing with immunity and with the invisible viruses, would now need many books, whole libraries, to present them in detail; here a passing reference must serve. I have already spoken briefly of the revolutionary changes which they have made possible in the diagnosis of infectious diseases, in the tracing of infections to their sources, and in the new creation therewith of large aspects of preventive medicine and new possibilities for the promotion of public health by law and administration. I ought still to give further emphasis, in passing, to the advances produced in curative treatment, as well as in individual protection, by the scientific study of immunity, which Jenner's vaccination had foreshadowed and Pasteur and his school had developed, but which had its effective beginning as a separate branch of science, immunology, in that remarkable last decade of the nineteenth century, during which the invisible viruses were also first clearly recognized. The first of the antitoxins, for the treatment of diphtheria and other infections, were such a gift of the 1890s. Some of them still hold a high place among the remedies which directly remove the cause of a disease or arrest its progress. A more recent development, however, and one to be greatly welcomed, makes it now possible largely to forestall the need for such curative treatment by actively immunizing in advance of exposure to an infection those liable to the risk of it. It is no longer an aspiration, but in certain advanced communities in the New World a matter of demonstration, that diphtheria can thus be eliminated altogether; and we ought to do it here. The possibility of a similarly effective protection against tetanus was demonstrated in the second world war.

Prevention

The proverbial recognition of prevention as better than cure applies not only to these uses of immunology but equally to the uses in medicine of other kinds of scientific discovery. Take for example that of the vitamins—one of the great gifts to practical medicine made by biochemistry, which itself, as a separate discipline, is a creation of the twentieth century. The use of vitamin D to treat rickets after that disease has appeared is already, in this country, an obsolescent anomaly. Rickets, which till so recently was a pathetic commonplace in the children of our industrial communities, disappeared in a few years when the nature of the dietary defect responsible for it had been discovered just over 30 years ago. We have almost forgotten its former threat to the physique and the health of our children. Even 20 years ago, when a pure vitamin D was first prepared, it had already become difficult to find cases of rickets for its trial in the clinic. And we may take this prevention of causes rather than the treatment of their results as the proper ultimate aim of medical policy, not only in dealing with other diseases due to shortages of other vitamins in the diet—scurvy, pellagra, beriberi—but even in planning further researches on those which are due to deficiencies of hormones. Though we have now a great army of diabetic patients to show us

daily that continuous treatment with insulin enables them to lead a nearly normal life, it would obviously be still better if we could find a way to prevent the deficiency, by arresting or reversing the injury to the pancreatic islets at its beginning, or even by anticipating its occurrence.

A very rapid epitome of the history of another disease during the century we are commemorating will further illustrate several factors in the transformation of the medical outlook which it has witnessed, as well as the accelerating tempo of the change. The first diagram in Sir Allen Daley's recent Purvis Oration, published in the *British Medical Journal* (June 9, p. 1279), shows at a glance that typhus fever must still have been dreaded as a recurrent scourge in the London of 1851, and that it ranked as a major cause of death in its outbreaks for many years after that. Then it almost disappeared, with no assignable reason except the general improvement in living conditions and sanitation. When I was a student, in 1900, a message reported the admission of an odd case of typhus to one of the London fever hospitals, and offered the rare opportunity of seeing what was by then becoming a medical curiosity in London. Between then and the first world war, however, evidence appeared showing that typhus was one of a group of infectious fevers transmitted from animals to man or from man to man by the bites of insects and other arthropods, and that epidemic typhus was carried from man to man by the body louse; so that the disappearance of typhus with rising standards of personal cleanliness, and its known tendency to break out in armies at war and in populations overtaken by the famine and devastation which a war leaves in its wake, all began to become clear. Then during the first world war the minute organism, *Rickettsia*, responsible for this louse-borne typhus, was discovered and the manner of its transmission was studied in detail. In the second world war, as soon as the potent insecticide D.D.T. became available, a threatened epidemic of typhus was stopped by the use of this agent on a louse-infested population. There remained, however, other rickettsial diseases belonging to the typhus group; and one in particular, carried from jungle rats to man by an almost invisible mite, caused a heavy mortality among our armies in Burma, and a serious threat even to the outcome of that campaign. No known insecticide could deal with the transmitter of the jungle typhus; but now, since the war, it has been found that one, at least, of the new antibiotic remedies, chloramphenicol, will rapidly eradicate a rickettsial infection which has already become established, and produce a prompt recovery of the patient. So another group of the great enemies to human life has been driven back to its last line of resistance, and beaten there.

A Pageant of Progress

While, then, we may accept prevention rather than cure as an ultimate aim, we are bound also to recognize that, so far as we can foresee, the curative and even the symptomatic treatment of diseases which it has as yet been impossible to prevent, diseases of infection as well as diseases of deficiency, will still be a major obligation in the practice of medicine. And it is obvious to everybody, I think, to patients and the public at large as well as to medical men, that there has been no greater transformation in medicine during recent years than in the direct efficacy of the medicinal treatment which research has now made available for many diseases. The story

of the triumphs of chemotherapy, conceived and inspired by the genius of Paul Ehrlich and effectively launched early in the twentieth century, has now been told so often that we need only remind ourselves here of a few of the milestones, or signposts for new lines of advance, on the course of what has indeed become a majestic pageant of progress. We think of "salvarsan," discovered in 1909, "germanin" (suramin) during the first world war, and the first synthetic remedies for malaria, most fortunately, before the second. In 1935, after long waiting, came the first specific remedies for the more familiar bacterial infections—sulphonamide derivatives, the "sulpha-drugs" in popular parlance; and then the use of penicillin, a British discovery worthy, we may well think, of a festival of its own; and now the other antibiotics in a still lengthening series. The change in the therapeutic prospect, in what the doctor can be expected to do for an illness, has been truly revolutionary. Not long ago a friend of mine, just recovered from an acute pneumonia under modern treatment, told me that he had come now to think of pneumonia—that "Captain of the Men of Death," as Sir William Osler called it not many years ago—as less troublesome on the whole than a common cold. "You see," he said, "they can really do something to cure a pneumonia now." And I believe that that represents a not uncommon attitude. The doctor's medicinal treatment is no longer, as it was in 1851 and even till the end of the nineteenth century, a subject chiefly for a grim kind of ridicule, which—let us be candid—much of it then deserved. The tendency is rather to go to the other extreme, to demand immediate miracles and to make it almost a cause of grievance that there should still be diseases for which medical research has not yet been able to find effective means of prevention or cure. "When," they ask us now, "is medical research going to find something really effective against influenza or poliomyelitis?"

Nobody, of course, can say when; only to-morrow can give that answer; but we have abundant ground, from analogies with what has already happened with many other diseases, for a prediction that also in the case of diseases like influenza and poliomyelitis, due to infections by viruses, effective means of preventive or curative treatment will eventually be discovered. We may remind ourselves, perhaps, though there is no great force in this analogy—that in more than one earlier instance, such as those of insulin and of the sulphonamide series, there seems to have been an interval of rather more than 30 years between the appearance of a reasonable basis for endeavour and the achievement of a decisive discovery. I was privileged to watch the discovery of the influenza virus in 1933 by good colleagues of mine; and I wonder whether those of you who live so long will have to wait till after 1963 to see that discovery made fully effective for the control of the disease. Who can say? We can only surmise that, with knowledge of the nature of the viruses so rapidly advancing, now that they can be cultivated on developing eggs, spun down with an ultracentrifuge, seen and photographed with an ultramicroscope, a practical fruition may yet come much earlier.

I have selected only some of the more vivid examples from a large range open to choice. In loyalty to my own special craft of physiology, and to British physiology in particular, I might have spoken of its far-reaching influence on all our knowledge of the functions

and disorders of digestion and excretion, circulation and respiration. I can only pause to ask you to let your thoughts turn for a moment, in a tribute of respect, to a great British master in that field, Sir Charles Sherrington, born only six years after the Great Exhibition, and still living to see the spreading influence of his work, his teaching, and his example on all modern progress in our knowledge of the normal workings of the nervous system and of departures therefrom.

To-morrow *

Looking more widely at the position and the progress of effective medical knowledge as a whole to-day, I see no sign that the rate of its advance is becoming slower, that it is yet approaching anything like a climax or the crest of a wave. Everything seems, on the contrary, to point to its continuing, even with an increasing acceleration, into any to-morrow that we can foresee. If I gave rein to my imagination I might easily find myself involved in all kinds of prophetic fantasies. But I think that I ought rather to use the few minutes which are left to me in asking you to consider what we are going to do to-morrow, with all this new and potentially life-saving knowledge which is pouring now, and will continue to pour in a swelling flood, from the laboratories and the clinics. It must surely be a matter of first concern to us who are medical men, and not only to us but also to the members of the public whom many of you serve as your patients, to be assured that all this new knowledge, without avoidable delay, can be put to its proper use for the common good, for the saving of life, the assuagement of suffering, whether bodily or mental, and the promotion of the general health.

I am no politician myself, medical or otherwise; but it has seemed obvious to me for some time that the cost and the organization of all that would be needed for the fulfilment of that purpose would become too great a task for unaided individual enterprise in medical practice, and that the State would sooner or later have to give its assistance to enable that need of the community to be met. The State has supported medical research in this country since 1913, and is doing so to-day on a scale more than 30 times as great as that with which it began. I have heard no suggestion that this expenditure is too great or has been ill applied. And, since our State has assumed this predominant responsibility for supporting medical research, it was not unnatural, I think, to expect that support would also, in due course, be forthcoming from the State, to enable the wealth of new knowledge resulting from the medical research of all the world to be brought progressively to the aid of everybody needing it. Speaking in this Great Hall, I cannot be unaware of the many personal and professional difficulties and hardships entailed by a rapid adjustment to the new structure of medical practice which State action has now created and imposed. I am neither unmindful of these nor unsympathetic. But it seems to me that the success of whatever solution to these problems may be found must, in a longer view, be measured by the degree to which it will ease the all-important task of bringing the new and ever-growing resources of medical knowledge to the service of the individual patient and the community. It is by its success or its failure in meeting that, its primary obligation, that our National Health Service must stand to be judged at the bar of history; and we must wait for To-morrow to give the verdict.

HOMOLOGOUS SERUM HEPATITIS AND MEASLES PROPHYLAXIS

A REPORT TO THE MEDICAL RESEARCH COUNCIL

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Since the report by the Chief Medical Officer, Ministry of Health (Report, 1938), and by medical officers of the Ministry (Memorandum, 1943) of 52 cases of jaundice and nine deaths among children who received convalescent measles serum or normal adult serum for the prophylaxis and attenuation of measles, it has been shown that homologous serum hepatitis is not infrequently associated with the parenteral inoculation of apparently normal whole blood and blood products. Findlay and MacCallum (1937, 1938) described cases due to the use of small amounts of human serum in yellow fever vaccine, and outbreaks due to the same cause were noted by Fox *et al.* (1942) in Brazil. Beeson *et al.* (1944) reported 101 cases in 266 soldiers inoculated with mumps convalescent serum. Beeson (1943), Morgan and Williamson (1943), and Bradley, Loutit, and Maunsell (1944) published records of cases in persons who had been transfused with whole blood or pooled plasma, and numerous reports have since appeared, including detailed follow-up investigations of groups of transfused persons by Spurling, Shone, and Vaughan (1946) and Lehane *et al.* (1949) in Britain, and by Brightman and Korns (1947) in the United States of America.

Apart from the outbreak described by the Ministry of Health, however, we have not found in the literature any other cases due to the administration of adult serum or plasma to measles contacts. In the London County Council, over a period of more than 10 years up to 1943, 366 litres of convalescent measles serum and normal adult serum from over 3,000 donors were used to inoculate 36,000 contacts, most of whom were followed up after an interval of two months or more from the date of inoculation. No cases of jaundice were found (Memorandum, 1943). In addition, 30,000 children were inoculated with normal adult serum in 5-10 ml. doses between 1940 and 1949; the serum was issued through the Emergency Public Health Laboratory Service and the Public Health Laboratory Service. No reports of hepatitis following these inoculations were received, but no specific follow-up inquiry was made. Cases may have been missed, however; Bradley and his co-workers mentioned that the cases they reported would not have been associated with the previous injection of plasma if attention had not been drawn to the relationship during