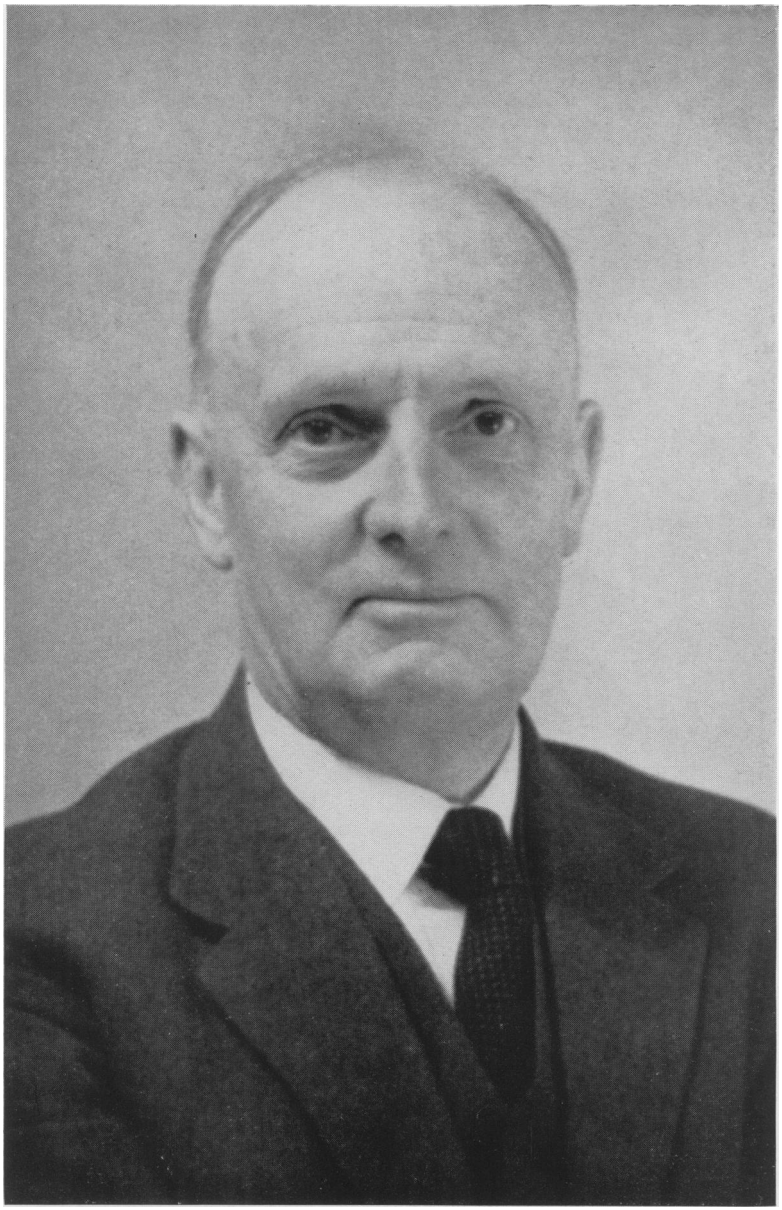

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LOOKING BACK TO MACKENZIE*

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IT FALLS to the lot of very few members of this College to deliver the annual James Mackenzie Lecture. When therefore I say that I am both grateful to the Council of the College for nominating me to the Mackenzie Lectureship this year and at the same time fully conscious of my unworthiness I hope you will deem this no mere formula of good manners, for I am confirmed in this latter belief when I look at the lengthening line of my distinguished predecessors. You, too, may well have your doubts about the quality of the fare to be put before you when you look at the title of this lecture—Looking *back* to Mackenzie!—surely anyone speaking on behalf of this young and vigorous College of ours should concern himself with the present and, even more, with the future rather than with the past. He should tell you something of the constant preoccupation of our undergraduate education committees both at council and at faculty levels with the medical, and especially with the general practice, needs of the young man or woman on the threshold of their medical careers. He should tell you of the plans of the research organization of the College to open up paths into territory still largely unexplored. He should tell you of the striking success of our postgraduate education committees in promoting and extending the continuing education of family doctors. All this is true but it is, I submit, equally true that, as Professor G. M. Carstairs pointed out in the 1962 Reith Lectures, one of the most striking phenomena of modern times is the explosive expansion of scientific knowledge. This phenomenon has had and is having such a profound influence on the science and art of medicine that it is necessary from time to

*Being the tenth James Mackenzie Lecture, given in the Great Hall of Tavistock House on 23 November 1963. Reproduced by courtesy of the editor of *The Practitioner*.

time to stop and survey the position.

I therefore invite you to look with me at a few—and they can only be a few—of the notable advances that have taken place in medicine and in some of the scientific disciplines not obviously related to medicine, since the year 1925. I have chosen 1925 for two reasons—first, because it was the year in which our great mentor, Sir James Mackenzie, died and second, because in that year the more senior among us had recently qualified in medicine or were about to do so—we have therefore been interested, and at times excited, spectators of the changing medical scene. But first of all let us take a quick look at the larger national scene. What sort of country were we living in in 1925? In that year the population of England and Wales was just under 39 millions—the latest available figures put today's population at just over 46 and a half millions. The Prime Minister of the day was that still enigmatic figure Mr Stanley Baldwin—later Earl Baldwin of Bewdley. His Chancellor of the Exchequer was a remarkable man then aged about 50, a man whose courage both in peace and in war was unquestioned but whose political stability was, in some quarters, doubted. Our fathers, for some obscure reason, appeared instinctively to trust a statesman who puffed contentedly at a pipe and who in his leisure hours gazed reflectively at the backs of pigs. They felt a little uneasy in the presence of one who habitually smoked cigars and who in those far-off days wore a surprising variety of unusual hats. In his budget for 1925 Mr Winston Churchill reduced the standard rate of income tax from 4/6 to 4/- in the £1—happy days—or were they? There were over a million unemployed adults, and poverty, hunger and sullen resentment were the lot of many of our fellow citizens. Was this the land fit for heroes to live in so stridently promised only a few years earlier? The British Empire Exhibition at Wembley was in its second year. The number of private motor cars in the United Kingdom was less than 400,000 (there are over 6 million of them today) and there were still 100,000 horse-drawn carriages and horse-drawn cabs on our roads and streets. Alan Cobham, the airman, flew from Croydon to Zurich and back, a distance of about 1,000 miles in 13 hours 49 minutes at an average speed of 74.5 miles per hour, and in July 1925 King George V and Queen Mary formally opened B.M.A. House here in Tavistock Square.

So far as the more restricted medical scene is concerned any comparison between the medical problems of the mid 1920s and the early 1960s must take into account, *inter alia*, the difference in the

age constitution of the population in these two epochs. In the mid-1920s there were many fewer people alive at ages 65 and over than there are today even allowing for the fact that the total population of England and Wales has increased by over 7 millions in the meantime. That this type of population-bulge will extend well beyond our time is common knowledge but I wonder whether we are aware of all its sociological and economic consequences. I am indebted to Sir George Godber, the Chief Medical Officer at the Ministry of Health for giving me figures illustrating this point. In 1925 of every 1,000 infants born alive 75 died before their first birthday—in 1961 the figure was 21. Of those infants who survived the hazards of birth the average expectation of life for males and females alike was 62 years in 1925: in 1961 the corresponding figures were 69 years for males and no less than 74 years for females.

For those of us who are now autumnal the mid-1920s were the years of our nonage, for the most part either in hospital or in general practice. I have been fortunate, through the kindness of the medical superintendent, in obtaining a list of the patients with their ages and diagnoses admitted to two of the general medical wards of my old teaching hospital in Glasgow during the months of January and February 1925 and a second list giving the same data for the same medical wards in the months of January and February 1963. Study of these lists brings to light three points of interest—the first is the comparative youthfulness of the patients admitted in 1925—for males the average age was 36 years with a range of from 13 to 76 years —for females the average age was 33.7 years with a range of from 12 to 65 years. In 1963 the average age of male patients admitted to the same wards was 58 years with a range of from 15 to 86 years—for female patients the average age was 56.8 years with a range of from 20 to 88 years. The second point of interest is the difference in the kinds of illness met with in hospital in the two epochs—in the earlier epoch an important part was played by infective processes —in the later epoch the wearing out of organs and tissues played a major role as a cause of illness. The third point of interest is the complete absence from the 1925 records of two diseases with which we are unhappily familiar today, viz. coronary artery disease and its complications and lung cancer. It is true that Herrick in America has described the clinical features of sudden obstruction of the coronary arteries as long ago as 1912, but in 1925 coronary artery thrombosis was still a rare disease and I do not recall seeing even one example of it when I was a student. The frightening increase

in the incidence of lung cancer appears to have been a still more recent phenomenon.

The thoughtful physician in 1925 must have had recurring phases of depression—not so his young house physician walking with the brisk, light step of youth along the hospital corridors—white coat-tails flying, the stethoscope dangling with studied negligence from the pocket, he was, as young people are wont to be, pretty full of his own importance—but how little, how very little we or our seniors could do for our patients in the medical wards—many of them young or young middle-aged. It is true that three years earlier, to be precise on 22 June, 1922, the first injection of insulin had been given, heralding the opening shot in the successful battle against diabetes, but to the sufferer from the other common medical diseases met with in hospital we had little to offer.

The practice of medicine consisted mainly of diagnosis—clinical diagnosis at the bedside for the most part, and skilled nursing—definitive treatment was scanty for in those days our therapeutic resources were very meagre. My teacher of pharmacology and therapeutics, who was in fact a skilful clinician albeit a therapeutic nihilist, used to tell us that the number of effective drugs in the pharmacopoeia could easily be counted on the fingers of two hands. All too often our clinical diagnoses were confirmed or, still more often, refuted at autopsy. In pneumonia, for example, one's chances of survival had little or nothing to do with the type of treatment adopted—they depended on a combination of youth, the type of the invading organism and the presence of skilled nursing—even so, the overall case-fatality rate was about 20 per cent. Patients suffering from pernicious anaemia were given arsenic up to what was quaintly called " the limit of tolerance ", i.e., until they showed the early symptoms and signs of arsenical poisoning. In fact, some patients so treated (or if you like, ill-treated) seemed to gain a little temporary benefit—I must confess I have never understood why—but ultimately they all died. Blood transfusion was seldom practised—we knew nothing, or practically nothing of the metabolic effects of water and salt deprivation. Patients suffering from a recent bleeding from a stomach ulcer were given nothing by mouth for days on end except possibly, and greatly daring, an occasional sip of iced water. They have been known in an agony of thirst to gulp water from the ward flower-vases when nurse's back was turned. I often wonder how many such patients died from our well-meaning therapeutic inertia. I hope I do not give you the impression that we were deliber-

ately cruel to our patients in hospital. I think we were in fact closer to them than is the house physician of today. Whenever nowadays I go into a hospital, especially a teaching hospital, the house physicians appear to me to have an almost hunted look. They are so busy taking blood samples for a staggering range of complicated biochemical and biophysical tests that they have no time to sit on the edge of a patient's bed when sister is safely out of the ward and discuss the prospects for the cup final.

In those far-off days biochemistry did not yet bestride the medical world like a colossus. Apart from our surgical colleagues, whose prowess we secretly envied, our chief henchmen were, I think, the radiologist and the bacteriologist. And how relatively simple bacteriology was—with a few exotic exceptions the common disease-producing germs fell into one or other of two classes, the one round, the other oblong—the cocci and the bacilli. In general terms, the cocci caused acute or subacute inflammation and suppuration, while among the bacilli we had the bacillus of diphtheria, of tuberculosis and of typhoid fever. Since then somebody—I fancy a systematic botanist—has got at the bacilli, dividing them up into a large number of different genera—or is it species?—and giving them very unpronounceable names. It is all very confusing—I'm not sure that it isn't rather sinister. I don't like it at all.

The young medical graduate taking his first, halting steps into the unknown world of general practice found therein much to cause him both alarm and despondency—that pale, ill-looking child with the septic throat—or is it a septic throat? Might it perhaps be diphtheria? Should I swab and wait for the report from the laboratory or give antitoxin straight away? I hope that the young graduate of today knows more than we did about psychological maladjustments as a cause of illness—we could hardly have known less. If this sounds like a criticism of my teachers it is not intended as such—we all revere our teachers and I am no exception, but in those days the realization that man has a psyche as well as a soma and that psyche and soma are inextricably interwoven had not yet been accepted into the corpus of current medical thought. A few years ago one of my predecessors in this lectureship gave us a brilliant exposition of the art of consultation. As I listened to him I recall so well the feeling, which still persists, that somehow or other we seemed when I was young to be more in step with our consultant colleagues than we are now. Specialization had not at that time undergone the fragmentation that we see today. There were still a few of the more

senior consultants who had graduated from the ranks of general practice—they had a much more vivid appreciation of the problems peculiar to general practice than their modern counterparts have, or so it seems to me. Our young medical friend would almost certainly meet examples of disease which, we hope, have now passed into medical history so far as this country is concerned; for example, the infectious disease of the nervous system popularly called sleepy sickness, which was epidemic in 1923 and 1924 and was still a cause for concern in 1925. Now listen to this sentence from the annual report for 1925 of the Medical Officer of Health of the City of Glasgow—one can sense the feeling of pride and satisfaction as he penned it. "For the second year in succession there has been an entire absence of typhus fever." I wonder how many of you in this room have seen even one case of typhus fever in this country: I certainly never have. Here is another quotation from the same source. "Affections which attack the respiratory system are undoubtedly more severe in children affected by rickets which, although diminished in prevalence, is still a factor which influences adversely the course of diseases of the chest." Well nowadays we know all about rickets and we won't see it again in our affluent society except possibly and very rarely as a complication of chronic kidney disease in the very young—or so I thought until I read the report for 1961 of the present Medical Officer of Health of the City of Glasgow. He writes:

> An aspect of child welfare which is coming to the notice of the staff and is somewhat disturbing, is the fact that in certain families the nutrition of the toddler, particularly the child between one and two years, is not as good as it should be. The way in which people spend their money in these families leads to poorly balanced diets and such children lack sufficient protein and vitamins. A few cases of rickets in this age group have occurred and it would appear that there is still need for intensive education of parents on the basic physical needs of their young children.

To return from this digression—the medical scene in the early and middle 1920s, sombre indeed as we look back at it, was soon to be brightened by a glow from the West. Banting and Best working in Toronto in 1921 discovered insulin and, as we have already noted, the first successful clinical trial took place in 1922. This partnership has always interested me because neither man was obviously equipped by virtue either of his training or his occupation at that time to make a major contribution to physiology. When they successfully isolated insulin Banting was a young surgeon with a leaning towards orthopaedics. Best was a medical student with no qualifications at all. In 1925 Minot and Murphy in Boston following up an

observation of Whipple's on the treatment of severe experimental anaemia began feeding raw liver to patients suffering from pernicious anaemia: they found that the anaemia gradually disappeared and the blood picture returned to normal. This highly effective but unappetizing diet marked the beginning of the successful treatment of a disease hitherto uniformly fatal. Today we keep our pernicious anaemia patients in good health by injections—not as it happens of liver, but we needn't go into that now—given at weekly, fortnightly or in a few cases as long as monthly intervals. Another chapter, a short one, in the story of the control of diabetes and of pernicious anaemia has still to be written, viz. the discovery of effective remedies for those diseases which can be given by mouth. As a matter of fact, in the case of certain types of diabetes occurring *de novo* in the middle aged and the elderly the writing of this chapter has already begun.

An earnest student of Parliamentary proceedings who was at the same time an attentive reader of the *British Journal of Experimental Pathology*—the combination is, I admit, a little unlikely—would in 1929 have noted an incident in each of his fields of study and he might well have failed to appreciate the importance of both. The first was the placing on the statute book of the Local Government Act of 1929. This Act was a landmark in English social history because it marked the end of the Poor Law; the Act transferred the functions of boards of guardians, whose main concern was the outdoor relief of destitution and the administration of hospitals (other than the voluntary hospitals) and institutions for the sick poor to the councils of counties and county boroughs. It was the intention of Parliament that the hospitals so transferred should be administered under the Public Health Acts and not under the Poor Law Acts. A few of the poor law hospitals thus taken over were fairly modern buildings (that is by 1929 standards) but many more were quite out of date and needed virtual rebuilding in order to convert them into general hospitals suitable for the treatment of the sick. The extent to which county councils and county borough councils assumed their new responsibilities varied in different parts of the country. Here in London the L.C.C. made full use of its new powers. It took over from the old Metropolitan Asylums Board 18 infectious diseases hospitals, nine tuberculosis hospitals, five children's institutions, several laboratories and the local land and river ambulance services. One of the hospitals taken over by the L.C.C. —on 1 April 1930—was the Hammersmith Hospital. In 1955 this hospital celebrated its jubilee and to mark the occasion a short

history of the hospital was published. From this booklet I have made a few notes which I hope you will find as interesting as I do.

Hammersmith Infirmary, as it was then called, was formally opened in 1905. It attracted widespread interest and was regarded by many as too lavish and too costly. Here is a current comment from one of the national newspapers:

> Poverty is no longer a crime: 'tis not a fate to dread, but a circumstance to welcome. Spendthrift Guardians in contributing to pauperism, have robbed it of all its horrors—for Hammersmith, at least—and one may have no fear but that, when the time cometh, he may retire into quarters luxuriously finished and furnished "replete with every modern convenience" as the auctioneer would say, and nearly as desirable from the "Casual's" point of view as that easier institution which stands next door to Hammersmith's palace for the poor on Wormwood Scrubs.

We can almost see the lips pursed in disapproval, the elegant, pearl scarf-pin, the heavy, gold, watch chain spanning the rotund bow-window, and sniff the rich aroma of cigar smoke.

The second incident noted by our 1929 student of the passing scene was the publication in the *British Journal of Experimental Pathology* of a paper entitled "On the antibacterial action of cultures of a penicillium with special reference to their use in the isolation of *B. Influenzae*"—the author was a Dr Alexander Fleming working at St Mary's Hospital, London. This paper apparently caused no great stir in scientific circles nor, and I think a little surprisingly, did a paper on the same subject which Fleming read to a meeting of the Medical Research Club in February 1929.

From our vantage point in 1963 it is all too easy to look back at the scientists of 1929 and make tut-tutting noises at them for their failure to realize that what they were in fact looking at was the dawn of the antibiotic age. After all, 11 years were still to run their course before the active principle of Dr Fleming's mould was successfully extracted by Florey and Chain at Oxford and the first therapeutic trials started. During these years several workers, including Fleming himself, tried to solve the problem, and failed. The reason was that all of them were bacteriologists and they all lacked the basic training in the techniques of applied chemistry which alone would have made success possible.

The statement so often made, so tiresomely often made, that in some curious way great scientific discoveries are made by some lucky chance is, I know you will agree, complete nonsense. As Louis Pasteur said many years ago, "There are no accidents in science: chance only favours the mind prepared". None the less there was certainly an element of luck in the discovery of penicillin.

Many years later, Sir Alexander Fleming with, may I say, characteristic Scots modesty wrote these words:

> In 1928 I hit on penicillin: the very first stage in the discovery of penicillin was due to a stroke of good fortune. Out of thousands of moulds one, and one only, produced penicillin, and out of the millions of bacteria in the world only some are affected by penicillin. If some other mould had come in contact with the same bacteria nothing would have happened; if the right mould had come in contact with some other culture nothing would have happened; if the right mould had come in contact with the right bacteria at the wrong moment there would have been nothing to observe.

It is, I think, true of really great men and women, it is certainly true of really great scientists, that they are nearly always modest people. Sir Alexander Fleming was no exception but I think that the key to his greatness lies in something else that he once said: " Never neglect any appearance or happening which seems to be out of the ordinary: more often than not it is a false alarm, but it *may* be an important truth ".

In his Romanes Lecture for 1950, Sir John Cockcroft calls the year 1932 the *annus mirabilis* for the Cavendish Laboratory at Cambridge. Incidentally, that small patch of English soil on which stands the Cavendish and its adjacent buildings has, I think, produced more Nobel prizemen than any area of comparable size on the habitable globe. Very briefly, in 1932, the workers at the Cavendish Laboratory made two exciting discoveries in the world of atomic physics. In the first of these Cockcroft and his colleague Walton succeeded in splitting the nucleus of the atom of a light element called lithium into two fragments each of which proved to be the nucleus of a still lighter element called helium. In the course of this reaction energy was released and Cockcroft and Walton showed that this release of energy could be accounted for almost exactly by the loss of mass in the system. In other words here was the first experimental proof of the equation relating mass and energy formulated by Einstein on theoretical grounds as long ago as 1905 and derived by him from his special theory of relativity. The second discovery was made in the same year by Professor, later Sir James Chadwick: he identified the electrically uncharged particles called neutrons—these particles, for reasons that need not concern us now, became by far the most potent projectiles for carrying out transformations in the nuclei of atoms. Looking back across the intervening years we can now see that in 1932 the thermonuclear age was at hand and yet, at that time, the prospects of utilizing the enormous forces locked up inside the nucleus of the atom seemed remote. Lord Rutherford himself declared that the idea of obtaining power from the nucleus was " moonshine ". Even as late

as 1937 he stated that in his view the outlook for gaining useful energy from atoms by artificial processes of transformation did not look promising. The reasons for this pessimistic outlook (if " pessimistic " is the right word) were twofold. The first was inherent in the make-up of the scientist: to quote Lord Rutherford again:

> It was not that the experimenter was searching for a new source of power or the production of rare or costly elements. The real reason lay deeper and was bound up with the urge and fascination of a search into one of the deepest secrets of nature.

The second reason was that in the mid-thirties, the methods of producing nuclear transformations were, by modern standards, very inefficient.

In the Middle Ages one of the favourite pursuits of the alchemist was the search for a method of transforming base metals into gold. In the late nineteenth and early twentieth centuries his modern counterparts, the medical chemist, the pharmacologist, and the medical bacteriologist spent many weary years looking for some chemical cure-all, some magic bullet that would kill disease germs in the human body without at the same time causing damage to the tissues. This line of research was a favourite with the German school headed by Paul Ehrlich, but until 1935 no magic bullet had been found that could be used effectively and safely against the common bacterial diseases—pneumonia, meningitis, blood poisoning, child birth fever, and erysipelas. Indeed, as long ago as 1912 that great man Sir Almroth Wright who was, you may remember, Sir Alexander Fleming's mentor, had categorically (and as events were to show a little unwisely) stated that " The use of chemotherapy for the treatment of bacterial infections in human beings will never be possible ". In 1935 Gerhardt Domagk of Elberfeld showed that a red dye named prontosil rubrum would kill streptococci in the bodies both of mice and of men and without endangering their lives or damaging their tissues. Domagk was subsequently awarded a Nobel Prize: he was not allowed to accept it by the German government of the day and he received it only after the second world war had ended. Workers at the Pasteur Institute in Paris showed that a colourless fraction of prontosil called sulphanilamide is the active constituent of the dye—moreover sulphanilamide is effective when given by mouth whereas prontosil had to be given by injection. In this country the first controlled trial of both prontosil and sulphanilamide was carried out in London at Queen Charlotte's Hospital by Colebrook and his colleagues. The results showed quite clearly that these drugs reduced the mortality and morbidity in one

variety of human streptococcal infection, namely puerperal fever. By 1938 a whole series of derivatives had been developed: individual members of the series were found to be effective in combating pneumonia, cerebrospinal fever, puerperal fever, bacillary dysentery, and some types of genito-urinary infection—the age of chemotherapy had arrived—despite Sir Almroth Wright—and a new figure, the pharmaceutical industry, appeared among the giants of commerce. Many hard things have in recent years been said about that industry. My predecessors in this lectureship have, I am sure rightly, eschewed both polemics and politics and I propose to follow their excellent example. I cannot, however, refrain from pointing out that, to name but two out of many important therapeutic advances, the modern and highly effective treatment of pernicious anaemia and the breakdown of the penicillin nucleus with the consequent ability to build synthetically a whole range of active penicillins are due entirely to research work carried out by British pharmaceutical houses and financed wholly out of their own pockets.

By 1938 it was obvious that yet again in the lifetime of many of us the lights were going out over Europe: the hopes and the fears, the horrors and the exultations, the disasters and the triumphs of the next seven years are recent history. Even from the senseless horrors of war additions were made to medical knowledge—the unquestionable value of timely blood transfusion in many medical and surgical emergencies, the life-saving work of surgical teams operating closely behind the forward troops, the skill of the chemist in producing synthetic drugs for use against malaria when the main quinine-producing countries of the world fell into enemy hands and, greatest of all, the successful extraction and later large-scale production of penicillin from the mould whose potentialities had been recognized by Fleming in 1928. The story is I know familiar to you—the succession of failures between 1928 and 1940 to which I have already referred, the successful production by Florey and Chain at Oxford in 1940 of a small quantity of an impure extract, the first successful therapeutic trial in man in February 1941, the impossibility of carrying the work any further here at home while we were under almost constant air attack and the daily threat of invasion, the journey in June 1941 of Florey and a colleague to America and still later the large-scale production of penicillin there.

Side by side with these glittering triumphs in the field of curative medicine a stubborn battle was being fought, almost unnoticed,

in the field of preventive medicine—this was the large-scale immunization campaign against diphtheria. There appears to be something in the British character which makes us very slow starters in any campaign of large-scale immunization and until 1940 our record of preventive inoculation against diphtheria was not good. In that year, however, a well-planned attack was launched and thanks largely to the work of the then Chief Medical Officer of the Ministry of Health, the late Sir Wilson Jameson, it was brilliantly successful: Sir Wilson later became one of the founding fathers of this College and, if you will pardon an expression of personal pride, I was a pupil of his 30 years ago at the London School of Hygiene and Tropical Medicine.

The second large-scale experiment in which everybody in these islands took part was food rationing: we might call it an enforced experiment in the physiology of nutrition. Although the diet lacked variety it was just adequate, there was no actual want and no malnutrition and the mechanics of food rationing were such that there were fair shares for all.

In 1940, in the United States still at peace, Landsteiner discovered the rhesus factor in human blood: at first deemed a whimsical academic curiosity it was soon found to be the key to the problem, hitherto unsolved, of certain kinds of intra-uterine and neonatal deaths. Determination of the rhesus factor in the blood of expectant mothers is now a routine of antenatal care.

From time to time peaceful games have been associated in macabre fashion with the grim business of war—Drake on the bowling green with the Armada appearing over the horizon and, whether the association is in fact historically accurate, the playing fields of Eton and the battle ground of Waterloo are the stock examples. In December 1942 the first successful nuclear chain reaction took place under the stadium of a football field in Chicago—and Hiroshima and Nagasaki were doomed.

The 18 years that have passed since the ending of the second world war have seen many important and exciting advances in medicine and the allied sciences—the ever broadening spectrum of the antibiotics, the near-miracle of modern anaesthesia, the use of radioactive isotopes both as valuable research tools and, though still to a lesser extent, in treatment, the emergence of the new sciences of molecular biology and cytogenetics—to name but a few. Medicine has indeed come a long way since 1925. I will not, in public at least, take part in the fascinating but hazardous game of prognostication but in the

short time that remains I should like to touch on one or two problems that seem to me to be important, albeit some of them are not, strictly speaking, medical. The first of these problems is the basic one of survival. I wonder how the early atomic physicists would have felt had they been able to see strategists of the early 1960s debating whether, in the event of a nuclear war between East and West there would be 70 or 80 mega-deaths in the United States from radioactive fall-out alone. (One mega-death is the Pentagon shorthand for one million dead.) The problem of survival also depends on another kind of explosion—the population explosion. The present human population of the world is about 3,000 millions—and of this number between one-third and one-half live permanently on or inside the border-line of starvation. It is estimated that by the year 2000 the population of the world will be 6,000 millions and that the greatest rate of increase is likely to take place in those areas which are at present least developed—Asia, Africa and South America. The recent conference at Geneva on the application of science and technology to less well-developed areas was heartening and we have started the freedom from hunger campaign none too soon, for in a problem of this size and complexity 37 years is a very short time.

When we shift our gaze from the world panorama to our own small and overcrowded island there is much that we can contemplate with sober satisfaction—infantile paralysis and tuberculosis in retreat and diphtheria all but conquered—provided we do not grow weary of immunization well-doing—a steady fall in infantile mortality and a steady rise in the average life-span—but there is another side to the picture—the cause or causes of cancer, of coronary thrombosis and, in most cases, of high blood pressure, still elude us, but with every now and then a gleam of hope to lighten our darkness: not only so, but our treatment of some of the less dramatic ailments is not I think as good as we are apt to imagine, for example, the results of the long-term medical as opposed to the surgical treatment of radiologically proven gastric and duodenal ulcers are lamentably bad. We do not know precisely the cause or causes of diabetes mellitus. Since its discovery 40 odd years ago insulin has saved thousands, perhaps hundreds of thousands, of lives but we still do not know precisely its site of action in the human body nor can we yet claim that strict adherence to diet and to insulin dosage will, in every case, protect the diabetic from the long-term complications of his disease. And what of those patients so familiar to every family doctor—we label them psychoneurotics—those unhappy

folk, who, either for a short time or for a long time have failed to come to terms with their personal environments? Yes, we have come a long way since 1925 but we have still a long way to go.

I wonder what Sir James Mackenzie would have said about our present-day problems: what, in particular, he would have thought of the spectacular advances in knowledge that have taken place since his day in his own speciality, cardiology. Mackenzie believed and taught that the only way to find out what a symptom betokens is to wait and see what happens to the patient with that symptom. His belief in the use of the unaided senses was as strong as his mistrust of mechanical devices—he even had some unkind things to say of the stethoscope. The stethoscope, he declared, had—

> . . . not only for one hundred years hampered the progress of knowledge of heart affections but had done more harm than good in that many people had had the tenor of their lives altered, had been forbidden to undertake duties for which they were perfectly competent, and had been subject to unnecessary treatment because of its findings.

These are hard words to an old friend. That we can see a little farther than he did is due solely to advances in technology. Thanks to the technique of phonocardiography whereby the various heart sounds and murmurs have been correlated with the dynamics of the circulation, listening to the heart has now become much more accurate and informative and the stethoscope can claim to be an instrument of precision. Advances in radiology and in applied physiology have thrown a flood of light on different forms of heart disease, notably on congenital heart disease, while modern anaesthesia, the development of heart-lung machines, and the technique of lowering the body temperature and of temporarily stopping the beating of the heart have allowed the heart surgeon to perform operations which only a few years ago would have been quite impossible.

Would Sir James allow us to add " look and listen " to " wait and see "? I think he might. Look and listen—these I believe are master words in medicine. You remember the aphorism " In medicine more mistakes are made by not looking than by not knowing "—and " listen "—listen not only to the fascinating sounds you can hear through a stethoscope but listen all the time. I believe that, despite the ever-growing range of laboratory tests, the taking of a full and accurate case history remains the first and by far the most important single step in the systematic investigation of the majority of human ailments. I am told by one who sat at his feet that one of the outstanding figures in the world of medicine

today and one who is also a very good friend of this College, Lord Cohen of Birkenhead exhorts his students from time to time with these words: " Listen to the patient, gentlemen—he is *telling* you the diagnosis ".

Not only is he telling you the diagnosis—I suggest to you that, in many cases, under a façade, it may be of apparent indifference, of forced jocularity, even at times of truculence, he is also mutely calling for help. The age of technology has vastly increased the range and the accuracy of our diagnostic skills and the scope and potency of our therapeutic resources. For these gifts we should be grateful but I sometimes wonder whether nowadays we are not in some danger of neglecting a technique of great value in diagnosis and not without its uses in treatment—the technique of listening sympathetically, attentively and yet critically to the patient's story. Not only should we listen to the patient, we should give the patient, in his turn, the chance to listen to us, for in all but the most trivial complaints he is anxious, often desperately anxious, to know something of the outcome of his own particular illness. Will he recover completely? If not, how disabled will he be? May he have to seek another and perhaps less well paid job? Admittedly there are times when we cannot make an accurate prognosis. Admittedly too there are times when, as doctors, we can see to the end of the road only too clearly: when this happens our concern for the patient, the *Caritas* that we have incorporated into our College motto often bids us tell a little less than the whole truth. Still I wonder whether on balance we tell our patients as much as in their interests we should. I think we may perhaps be a little remiss in this matter.

You will recall that at the beginning of this study we alluded to the young man at the outset of his medical career. If this young man asked me for advice on matters clinical I think I would say something like this: " My young friend, you have at your disposal an ever-growing range of diagnostic techniques of great accuracy—make them your servants but never your masters. Your therapeutic armoury is well stocked with weapons, all of them useful, some of them of quite alarming power—your teachers will have told you how and when to use them, and, I hope, how and when not to use them. One plea I would make—wherever, in the hospital ward, the hospital outpatient department, in your consulting room or in their own homes you meet those frightened, exasperating, infuriating, but lovable fellow-men and women—your patients—you will listen to them—won't you? "