

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

## Recent Advances in Medical Science

### *A Study of their Social and Economic Implications*

Probably at no time in the world's history has the average citizen of this and of most other civilised communities felt so insecure against death by violence. At no time in the world's history has the same citizen had reason to feel so secure against death by disease.

The cause of the first of these outlooks fills us with despair: the cause of the second gives us great satisfaction. It seemed opportune, therefore, that this year's Robert Rede lecture should be devoted to an account of certain of man's activities which have formed the basis of his present-day sense of security of health. It may be possible by this means, at a time when many are doubting whether sanity and righteousness occupy the dominant place usually ascribed to them, to restore to their minds a firmer belief in the power of the human intellect to guide their destiny. If war and present-day national policy in many countries are based on the assumption that human life is nothing, except in so far as it contributes to national power, the basis of my discourse to-day is different, namely, that human life and health, developed and enjoyed to

( 5 )

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

a maximum degree by each individual, are in themselves the most precious of all things in the world.

The mind of man has never been so active as it has been during the turmoil of recent years in analysing social, economic and political factors in the endeavour to appraise the part played by each in national and international existence. In these analyses one of the greatest revolutionary changes, which has influenced the life of almost every individual in civilised communities, has been generally overlooked, both by the public and even by the leaders of sociology and history. I refer to the effects of the rapid advance of knowledge in medical science. This knowledge has brought to mankind the means of conquering many diseases, of improving the standard of health and physique of the average individual to a degree never known before and of warding off death itself. This kind of victory of the human mind is wholly and universally beneficial to the individual, and has not been obtained by one race at the expense of another, but by the finest type of international co-operation. It represents one of the highest intellectual efforts ever made and, by reducing pain, suffering and grief, on the one hand, and by increasing the benefits of life and the power of appreciation of much that is best in it on the other hand, has contributed greatly to the advance in

( 6 )

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

human happiness and efficiency. Its success represents a vast achievement, and its certain promise of even greater success in the future cannot but act as an antidote to the present political insanity of the world.

My theme to-day is not to be confined to the singing of a pæan of praise centring round these modern advances in knowledge and the control they bring over human suffering, but it is also to call attention to some of the social and economic implications of such knowledge. Some of these effects, which I can only briefly mention in the course of a lecture, are clearly of great importance and require the attention of others more highly qualified than myself. Lowered mortality rates, longer life and improved standards of health and physique must be factors of prime importance in all aspects of national and international life, and since, short of a world catastrophe, all these changes are likely to increase greatly in the future, it may be wise for students of mankind to consider now their probable influence on the community and on the world in general in years to come. Whereas most individuals will interpret these developments as beneficial to themselves and their families, it is certain that, from the point of view of the State, some may not be beneficial but even, in certain respects, harmful. No subject can less afford to be dealt with by emotional, un-

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

informed and haphazard methods; only by knowledge and careful foresight can the best be made of the great advances in the conquest of disease.

Many people do not appreciate what a frail thing human life, especially early life, is, and what a small chance there was for the average baby to survive, until medical science entered the field. Less than 200 years ago, i.e. up to the year 1750, 74 per cent of all children born in London died before reaching the age of five. At present, probably less than 12 per cent of all children born in this country die before reaching this age. Thus, in spite of a great decrease in the fertility rate of women and much emigration, a population, stationary for many centuries, was changed to the rapidly expanding one of the past century. You will, therefore, realise why it can be claimed with reason that medical science, by placing in the hands of man powerful weapons for combating disease, may be regarded as the greatest practical factor that has influenced human society. Parenthetically I may add that, in view of these and other facts to be mentioned, it is often a cause of amazement to see the low esteem in which many people hold medical science, although this seldom extends to their private medical practitioners. If there is any doubt on this matter, the perusal of a discussion in the House of Commons on any health topic will quickly confirm this statement.

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

#### THE ADOPTION OF THE EXPERIMENTAL METHOD IN MEDICAL INVESTIGATION

It is unnecessary before my present audience to dwell on the reasons why medical science has made such great progress, especially in the last sixty years. It followed immediately on the realisation that the experimental method is the royal road to discovery, not only in the case of inanimate matter but also in relation to the structure, functions and diseases of organisms, including man himself. When he was faced with the limitation of experimenting on man, the scientist came to appreciate the great potentialities of investigating the reactions of lower forms of life, and he seized this opportunity with both hands. Occasionally, in attempting to extend the newly discovered facts of biology to man, he has been wrong but, generally speaking, this weapon of research has proved of immense value in terms both of human and animal life and health. With the acceptance of the modern view that medicine is a scientific study, that disease need not be associated with ideas of guilt or superstition or that it has supernatural implications, that health is the normal state and a right of man, all the older views of ill-health, which have lasted throughout the ages and which were based mainly on religious teachings, have been superseded. Man has at last been able to get

( 9 )

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

down to the study of actual disease and has wrested from nature sufficient facts greatly to extend the control of his own destiny.

Even during this period of advance of knowledge, the attitude of medical science towards its problems has changed rapidly. In the first period of expansion, following the work of Pasteur, Lister and Koch, there was a tendency to regard all disease as due to the invasion of the body by some form of micro-organism. This hypothesis led to a wonderful advance in the control of many diseases. It then became clear that other diseases could not be explained on this basis and that much ill-health was due to some chemical abnormality in the body, the lack or excess of some substance which upset the balance necessary for health. Sometimes this unbalance was due to wrong diet, providing too little or too much of certain chemical factors, sometimes the failure was more attributable to defective working of certain body cells themselves, and the whole subject of harmonic disharmony was revealed. In more recent years it has become evident that invasion of the body by pathogenic micro-organisms and lack of chemical balance of the body are often associated, and even that the pathogenicity of micro-organisms is itself a chemical problem. We have now arrived at the stage when the human body, from the point of view of health and disease, has become largely

( 10 )

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

a problem of co-ordinated and balanced chemical reactions, and investigations are directed more and more to the study of chemical changes compatible and incompatible with the proper functioning of tissues. Once a biological observation has been made, be it physiological, pathological or clinical (and biological discoveries are always the most difficult to make in medical science), the investigator of the present day knows that the observed phenomenon will be extended and interpreted in terms of chemistry. It is this hypothesis and the sense of certainty it conveys that accounts for much of the success and optimism of the modern investigator in medical science.

#### ADVANCES IN THE CONTROL OF HUMAN DISEASE

While the physiologist and pathologist have been patiently building up the foundation of knowledge of the body in health and disease and providing the basis upon which all advancement in medical science depends, others have investigated the more applied side of curative and preventive medicine. The immunologist has taught mankind how to control, either by prevention or cure, many infective diseases by inoculation with toxins, toxoids and antitoxins, vaccines and antisera. Increased control has thus been obtained over diphtheria,

( II )

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

measles, whooping cough, cerebrospinal fever, tetanus and anthrax. The extension of physiology and biochemistry, even in the last twenty-five years, has opened up the field of nutritional disease and thereby provided control of such conditions as rickets, osteomalacia, defective tooth formation, scurvy, beri-beri, pellagra and night blindness, and also revolutionised the most important subject of feeding, especially of infants and growing children.

Since antipyrin, acetanilide and phenacetin were prepared in the laboratory and prescribed for the relief of pain fifty years ago, the use of synthetic drugs for the treatment of symptoms and indeed for the actual cure of disease has achieved great success. The introduction of organic arsenicals by Ehrlich in 1910 for the cure of syphilis was followed by the discovery of other synthetic drugs for the cure of malaria, bilharzia, kala azar and sleeping sickness. In the past three years we have seen the wonderful effects of another type of chemotherapeutic agent, namely, the sulphanilamide derivatives which, from the point of view of disease in this country, probably represent the greatest advance in treatment of the present century. Until these discoveries were made, no instance of a chemotherapeutic agent having a specific effect on bacterial infections was known. Now streptococcal, meningococcal and pneumococcal infections, previously the most deadly of

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

all diseases, have for the most part been brought under control. Sepsis and septicaemia of child-birth, meningitis, erysipelas, gonorrhoea and infections of the genito-urinary tract and pneumonia are now treated successfully with such drugs as prontosil, sulphanilamide and the more recently discovered 2-sulphanilyl-aminopyridine. In the past month it was reported that, in a series of between 600 and 700 cases of pneumonia at Birmingham, the mortality rate was lowered, in the case of patients under fifty years of age, from 17 to 1·6 per cent and in patients over fifty years, from 50 to 24 per cent by the use of 2-sulphanilyl-aminopyridine (W. F. Gaisford, *Lancet*, 1939, 1, 823). In observations made in the Sudan, the mortality rate of cerebrospinal fever was reduced from one varying between 70 and 95 per cent to 5 per cent by the use of these drugs.

Before leaving this subject of disease control, it is also necessary to refer in passing to the triumphs of recent work on hormones—to the modern methods of treating diabetes mellitus with insulin, pernicious anaemia with liver active principle, Addison's disease with substances prepared from the adrenal cortex, myxoedema with thyroxine, and various conditions amenable to treatment by sex hormones. This is also one of the most active divisions of medical science.

For brevity's sake it is only possible to recount

Cambridge University Press

978-1-107-63707-8 - Recent Advances in Medical Science: A Study of their Social and Economic Implications: The Rede Lecture Delivered Before the University of Cambridge on 28 April 1939

Sir Edward Mellanby

Excerpt

[More information](#)

---

here a few of the triumphs of modern medical research. These are the fruits of the tree, the tree itself being, from a scientific point of view, vastly more important than its fruit. May I also add that in this amazing growth there are no more active branches in the world than are found in the medical school of this university?

As for other outstanding examples of the effects on health and disease in man of the application of increments of knowledge, these can be cited briefly. The adoption of better standards of sanitation and cleanliness, developed and supported by the science of bacteriology and immunology, cleared out of the country many of the decimating diseases of past centuries. Plague, malaria, typhus, cholera and smallpox, which killed their thousands and tens of thousands, disappeared in the nineteenth century. Typhoid fever which, even in the year 1900 killed over 5000 people in this country, was responsible for the death of only 206 people in 1937, and any mild epidemic nowadays is liable to create a great public scandal.

Other infectious diseases, although still with us, have been reduced greatly in their killing power. Tuberculosis, which in the years 1871-80 killed annually in this country 2880 out of every 100,000 people, had a mortality rate of 690 only in 1937. Mortality due to scarlet fever sank from 720 per 100,000 people in the years 1871-80 to 9 in 1937.

( 14 )