demonstrations soon proved to be of great value to the farmers of the Eastern Counties and went far to dispel their mistrust of everything connected with laboratories and experimental farms.

Middleton's stay in Cambridge was a short one, for in 1906 he accepted the post of assistant secretary of the Board of Agriculture. It is no secret that he had misgivings about the advisability of doing so, and his friends, realizing how much his interests were bound up with an open-air life, did their best to dissuade him from taking this step by pointing out that the Board, at this time, had only a somewhat tenuous interest in education, and no vision whatever of the part research work could play in the development of agriculture; but the view that he could do more for agriculture as a Government official than as a university professor won the day.

This post he held until 1919, acting during the last two years of his tenure as deputy director general of the Food Production Department. The campaign he then became responsible for, hurriedly planned as it inevitably was, added the produce of approximately an extra three million acres to the national food supply in spite of a great shortage of labour, fertilizers and machinery. The full story of it is told in his book "Food Production in War" (Oxford, 1923).

With the coming of peace in 1918, Middleton was appointed a commissioner under the Development and Road Improvements Funds Acts of 1909-10. He continued to serve the Development Commission until 1941, becoming its vice-chairman in 1929. His tenure of office was broken into in 1926-28, when his wide experience of agricultural administrative work and his knowledge of agriculture in India was put at the disposal of the Royal Commission on Agriculture in India.

In 1938 Middleton was appointed chairman of the Agricultural Research Council by a committee of the Privy Council for the Organization and Development of Agricultural Research, after consultation with the Royal Society. He was ideally fitted for guiding a Council consisting of scientific men with no special knowledge of agriculture, and agriculturists with an equally limited outlook so far as scientific matters were concerned, for his work had brought him into contact with the research staffs of practically all of the agricultural institutions in Great Britain, and he never missed an opportunity of discussing with them, no matter what the subject, the investigations they were engaged upon. A wide general knowledge of the more important of the sciences bearing on agriculture made this possible and put him in a position to see most of the problems of agricultural development, as the directors of research institutes have to, from both the scientific and practical points of view.

Of the honours which fell to Middleton, two were especially valued. One of these was the fellowship of the Royal Society, awarded in 1936; the other was the Gold Medal of the Royal Agricultural Society, given for distinguished services to agriculture. He was, fittingly, its first recipient. The Universities of Aberdeen, Edinburgh and Wales conferred the LL.D. and Reading the D.Sc. upon him. In 1913 he was made C.B.; the honour of K.B.E. came in 1918, and K.C.I.E. in 1929.

Endowed almost to the end of his life with the best of health and a fine physique, Middleton was capable of tiring out his staff and the visitors to his demonstration plots, and then returning to a strenuous evening's work in the laboratory or his home. But though he never seemed to allow himself any leisure,

he found time for two hobbies: one was photography, and wherever his work or his holidays took him he carried a camera; the other was gardening. In Cambridge, in somewhat difficult conditions, he maintained a first-rate collection of roses chosen, as they flowered in a local nursery, with the keen discrimination of an old-time florist and grown with the aid of combinations of the various artificial manures used in his farm demonstration plots.

He married Lydia Miller, daughter of the late Prof. Davidson of Adelaide; she died in 1934, leaving a son and a daughter. ROWLAND H. BIFFEN.

Dr. Karl Landsteiner, For.Mem.R.S.

THE death of Dr. Karl Landsteiner on June 26 in New York has closed a career of singular eminence in the realm of medical research. He was born in Vienna on June 14, 1868; graduated in medicine in 1891 at the University there; and from 1909 until 1919 held the post of professor of pathological anatomy in the University. After the War of 1914-18 he left Vienna to work in a hospital in The Hague, and from 1922 until his death he carried out his researches as a member of the staff of the Rockefeller Institute in New York.

As a young investigator, Landsteiner was deeply interested in the problems of serology and immunology. Together with Donath he made observations on the substance in organ extracts which lyses the strictly homologous red cells, and which he and his co-worker identified as Metchnikoff's macrocytase. With Halban he studied the differences of foetal and maternal blood sera from the point of view of their lytic, agglutinating and bactericidal properties. Donath and Landsteiner in 1904 and 1905 made a notable contribution to knowledge of the role of intravascular lysis in the pathogenesis of paroxysmal hæmoglobinuria. But the chief work of Landsteiner at this early stage was the recognition of differences in human red blood corpuscles when obtained from different individuals, and the separation of the red cells into four well-defined groups characterized by their behaviour when exposed to the action of the two main types of agglutinins that are met with in human sera. A statement foreshadowing this work was made in a footnote to a paper on the anti-enzymic, lytic and agglutinating action of blood serum and lymph, which is dated February 10, 1900. He was an assistant in the Institute of Pathology in the University of Vienna when, in 1901, he published his work on iso-agglutination and the blood groups. Even at this early date he was aware of the probable significance of his results for medico-legal purposes and in the practice of blood transfusion. The value of his pioneer researches on the subject was attested when, in 1930, he was awarded the Nobel Prize in Medicine.

The importance of this work has been abundantly proved during the present War in the avoidance of undesirable reactions by ensuring that the donor's blood is compatible with that of the recipient. In spite of every care, inexplicable reactions have occasionally occurred, and it was Landsteiner and Wiener who threw light on these accidents when, in 1940, they discovered a hitherto unsuspected antigen, the *Rh* factor, a symbol chosen because a similar antigen exists in the blood of rhesus monkeys. This antigen is present in the red blood cells of 85 per cent of human subjects, and an important extension of knowledge arising from its study has

been the elucidation of the cause of the hæmolytic anæmia of newborn infants; this disease has been found to be due to the production of a lysin in the blood of an *Rh*-negative mother when the fœtus has inherited the *Rh* factor from the father.

The first two papers by Landsteiner and E. Popper on the experimental transmission of poliomyelitis to monkeys appeared in 1908 and 1909, and opened the way to intensive study of the mode of transmission of the causal filterable virus and of its neutralization by a specific immune serum.

During the twenty years between 1917 and 1938, Landsteiner and his co-workers extended the observations of Obermayer and Pick on the changes in the immunological specificity of proteins which result from modifying their chemical and physical structure. This series of researches gave full rein to Landsteiner's creative and analytical powers; in particular, the ingenious experiments with artificially

conjugated antigens and the corresponding immune sera have shed much light on the nature of the serological specificity of proteins and cell antigens.

The last years of his life were devoted to studies on allergic manifestations produced in experimental animals in response to simple chemical compounds such as picric acid and quinine.

The consistently high level of Landsteiner's achievements throughout the long period of his active life makes it natural to imagine that he knew little or nothing of the painful gropings after scientific truth which afflict lesser men. Although his work received recognition in many quarters—he was elected a foreign member of the Royal Society in 1941—he bore himself modestly, and indeed seemed to forget self-interest in his preoccupation with the problems upon which his mind was bent. His name is assured of a permanent place in the records of experimental medicine.

G. F. PETRIE.

NEWS and VIEWS

The Wellcome Foundation: New Research Appointments

DR. C. M. WENYON will be retiring shortly under the age limit from the directorship-in-chief of the Wellcome Research Institution and the directorship of the Wellcome Bureau of Scientific Research. His association with the research laboratories founded by the late Sir Henry Wellcome has extended over thirty-six years, commencing at the Wellcome Tropical Research Laboratories in Khartoum in 1907. Among his many contributions to the literature of protozoology his "Protozoology—A Manual for Medical Men, Veterinarians and Zoologists" is outstanding. Dr. Charles H. Kellaway, at present director of the Walter and Eliza Hall Institute for Medical Research, Melbourne, has accepted the invitation of the Board of the Foundation to assume the directorship-in-chief of the Wellcome Research Institution and the Foundation's other research laboratories at home and overseas. His appointment will become effective as early in 1944 as the convenience of the governing body of the Hall Institute and transport arrangements from Australia will permit.

Dr. N. Hamilton Fairley will take over the directorship of the Wellcome Bureau of Scientific Research. However, as he is at present Colonel A.A.M.C. and is serving as director of medicine to the Australian Army in the Pacific, he will be unable to proceed to England until a later date. Dr. T. A. Henry will be retiring on August 31, after which the Wellcome Chemical Research Laboratories (London) will be merged in the Wellcome Bureau of Scientific Research referred to above. Dr. Henry's work in the field of plant alkaloids is well known, and his book, "The Plant Alkaloids", is regarded as a classic in this field. The laboratories under his direction have always specialized in the chemistry of tropical medical research and will continue to do so.

Dr. Erwin E. Nelson, at present director of pharmacology at Tulane University, New Orleans, has been appointed director of the Wellcome Research Laboratories at Tuckahoe, N.Y. Dr. Nelson, who graduated in medicine at the University of Michigan,

was from 1919 until 1937 assistant professor, associate professor and then professor of pharmacology there. During that time he was lent to the U.S. Government for two years so that he might organize the Pharmacological Department of the Food and Drugs Administration. Plans are in view for the further development of the Wellcome Chemical Research Laboratories at Beckenham under Dr. Sydney Smith, and a considerable expansion of the Foundation's research activities is envisaged for the immediate post-war period. Various changes in the organization of the Laboratories will be made in order that the Foundation's own research plans, as well as those carried on in collaboration with Government Departments, the Therapeutic Research Corporation and other bodies, may be fully realized.

A Staff College for the Civil Service

IN NATURE of May 8 was published a leading article which raised what we regarded, and still regard, as pertinent questions for the committee appointed by the Chancellor of the Exchequer to examine the matter of the training of Civil servants. We pointed to the committee's terms of reference and asked why the possibility of establishing a staff college should have been given special prominence, and we went on to give our views as to why a staff college, *if it be the only means of entry into the service*, may have precisely the results which ought, at all costs, to be avoided. Nothing in what we said, however, decried or was intended to decry the value of a staff college if it be given its proper place in any scheme for the preparation of future administrators. Our point was that such a college should not be allowed to take the place of the universities, the technical colleges and the other educational institutions in which candidates for the Civil Service may gain their first qualifications. We hope, however, that the committee to which we have referred will study carefully a paper on the "Post-Entry Training for Administration from the Industrial Aspect" recently delivered to a conference of the Institute of Public Administration by Mr. E. S. Byng, vice-chairman of Standard Telephones and Cables, Ltd.