SCIENTIFIC NOTES AND NEWS

ON the occasion of the one hundred and forty-ninth anniversary of the founding of Union College the doctorate of laws was conferred on Joseph W. Barker, dean of the Faculty of Engineering of Columbia University, special assistant to the Secretary of the Navy.

AN honorary doctorate of engineering was conferred on Charles F. Wagner, manager of the central station engineering department of the Westinghouse Electric and Manufacturing Company, at the fiftieth anniversary convocation on February 21 of the Illinois Institute of Technology. The citation reads: "For pioneering research in the application of symmetrical components to power system analyses; for his outstanding contributions to the modern theories of synchronous and induction machine performance; and for his leadership in the investigation of natural lightning phenomena and the application of knowledge regarding lightning to the protection of electrical systems."

DR. WILLIAM M. WHYBURN, professor of mathematics at the University of California at Los Angeles, has been elected a correspondent of the National Academy of Exact, Physical and Natural Sciences of Lima, Peru.

THE Council of the Royal Aeronautical Society, London, has elected Group Captain F. Whittle a fellow of the society, in recognition of work of great importance in aeronautics.

SIR HENRY DALE, president of the Royal Society, director of the laboratories of the Royal Institution, London, was presented on January 13 with the Hanbury Memorial Medal of the British Pharmaceutical Society.

THE honorary gold medal of the Royal College of Surgeons, London, was presented at the Buckston Browne luncheon at the college on February 12 to W. H. Collins, chairman of King Edward VII Hospital, Windsor, in recognition of his gift of £100,000 to endow the department of pathology, with provision for a further like sum to extend and develop the department of pathology at Lincoln's Inn Fields and to found there a chair of human and comparative pathology.

THE Harrison Lectureship Medal was presented on February 10 to Dr. Arthur James Ewins, F.R.S., at the House of the Pharmaceutical Society of Great Britain. Following the presentation Dr. Ewins delivered the Harrison Memorial Lecture on "Progress and Problems of Chemotherapy."

P. M. S. BLACKETT, F.R.S., Langworthy professor of physics in the University of Manchester, has been appointed president of the British Association of Scientific Workers, which now has a membership of nearly 15,000.

DR. FRANK S. LLOYD, professor of education at New York University and executive director of the division of physical fitness of the Federal Security Agency, has been appointed chairman of the department of hygiene of the College of the City of New York.

DR. KENNETH C. REYNOLDS, associate professor of hydraulics in charge of the river hydraulic laboratory of the Massachusetts Institute of Technology, known for his work in hydraulic engineering, has been appointed head of the department of civil engineering at Cooper Union with the rank of professor. He succeeds Professor Edward S. Sheiry, who has resigned. Dr. Reynolds is now on leave of absence from the Massachusetts Institute and is in charge of a special investigation of waves for the Bureau of Ships under the Oceanographic Institution at Woods Hole.

AT Temple University, Philadelphia, Dr. Wilbur Emory Burnett, professor of clinical surgery at the School of Medicine, has been appointed professor of surgery to succeed Dr. William Wayne Babcock, who has become professor emeritus; Dr. Thomas Harold Davis has been appointed to succeed Dr. Robert F. Ridpath, professor of laryngology and rhinology; Dr. John Franklin Huber to succeed Dr. John B. Roxby, professor of anatomy; Dr. Robert H. Hamilton, Jr., to succeed Dr. Melvin A. Saylor, professor of physiologic chemistry; Dr. Morton J. Oppenheimer to succeed Dr. Joseph G. Hickey, professor of physiology, and Dr. Lowrain E. McCrea to succeed Dr. William Hershey Thomas, professor of urology.

DR. R. V. TRUITT has resigned as professor of zoology and agriculture at the University of Maryland to devote his full time to the enlarged program of the Department of Research and Education at Solomons Island, Md., of which he is director.

DR. MICHAEL LEVINE, biologist in charge of the Cancer Research Laboratory of Montefiore Hospital, New York, has been appointed assistant director. He assumed his new work on March 1.

DR. WILLIAM H. HEADLEE, head of the division of tropical medicine and parasitology at the School of Medicine of Indiana University, Indianapolis, will leave during the present month to conduct a study of tropical diseases in Guatemala, Honduras and Costa Rica, under the auspices of the Association of American Medical Colleges and the Markle Foundation in cooperation with the army medical corps.

AT the Kansas State College, Dr. H. E. Myers, pro-

fessor of soils, has leave of absence for two years to serve as agricultural adviser to the State Department. In his absence Hugh G. Myers, agent for agronomy at the Garden City Substation, has been made associate professor of soils. Dr. Roger C. Smith, head of the department of entomology, has leave of absence to serve as allocations specialist in the biological sciences and agriculture for the War Manpower Commission.

THE second annual Robert J. Terry Lecture of the Dr. William T. Coughlin Foundation was given on December 21 in the auditorium of the St. Louis Medical Society by Dr. Henry Pinkerton, professor of pathology in the School of Medicine of St. Louis University. His subject was "Typhus, Rocky Mountain Spotted Fever and other Rickettsial Diseases."

PROFESSOR HARLEY J. VAN CLEAVE, of the department of zoology of the University of Illinois, was the speaker at the science section of the Oklahoma Education Association, which met in Oklahoma City from February 16 to 18. His address was entitled "Returning Service Men—A Threat to National Health." He also gave an illustrated lecture on the "Biological Aspects of Conservation."

DR. OTTO LOEWI, research professor of pharmacology at the New York University College of Medicine, delivered on March 28 the Rothschild Lecture at Beth Israel Hospital on "The Chemical Transmission of Nervous Impulse."

DR. HENRY R. KRAYBILL, director of the research laboratory of the American Meat Institute, professorial lecturer at the University of Chicago, will lecture for the Ontario Research Foundation at the March meeting of the Toronto Chemical Association. His lecture will be entitled "The Spectral Analysis of Fats."

SIR HAROLD SPENCER JONES, Astronomer Royal of Great Britain, will deliver the 1944 May Lecture of the Institute of Metals. His subject will be "Metals in the Stars."

THE Friday evening discourses for the present season at the Royal Institution, London, include one on "Brain Rhythms" by Professor E. D. Adrian, F.R.S.; one on "The Medical and Surgical Achievement of Soviet Russia in War," by E. Rock Carling, and one on "Habit and Evolution," by Professor D. M. S. Watson, F.R.S. In addition the following courses of lectures have been announced: "Modern Developments in Dairy Science," by Professor H. D. Kay; on "Fungi and Modern Affairs," by J. Ramsbottom; on "The Mode of Action of Some Vitamins," by Professor A. R. Todd, F.R.S.; on "Chemical Factors in Nervous Effects," by Sir Henry Dale, P.R.S.; and on "Food Fads and Food Fallacies," by Sir Jack Drummond.

THE Rockefeller Foundation has made an appropriation of £1200 for bio-chemical investigations of penicillin under the direction of Professor Howard Walter Florey, F.R.S., professor of pathology at the University of Oxford.

TWENTY-TWO postgraduate fellowships for research in the field of chemistry for the academic year 1944–45 have been provided by E. I. du Pont de Nemours and Company. Appointments to these fellowships, which amount to $750 each, will be made later in the year by the heads of the departments of chemistry of the several colleges and universities to which grants have been made.

GRANTS amounting to $35,600 have been made by the Research Foundation of the Ohio State University, of which Dr. A. R. Olpin is executive director, to stimulate and foster research in the basic sciences. These are $10,000 for Research Foundation fellowships in the Graduate School; $10,000 for research on nuclear x-ray sources; $5,000 for research in applied mathematics; $5,000 for research in electronics; $5,000 for surgical and medical research; and $600 for a technical assistant in zoology and entomology. The Research Foundation was established in 1937 as a nonprofit corporation, to serve as a contractual and administrative agency for researches conducted under contract in university laboratories, with both private and government support. It also handles all patent matters for the university. The foundation has acquired control of many valuable inventions of a patentable nature and has licensed manufacturers to operate under the patents. Income from royalties and other earned income is set aside in a research reserve to foster new cooperative research programs.

POST-WAR plans for teaching and research in tropical medicine are now being formulated at the DeLamar Institute of Public Health of the School of Medicine of Columbia University, of which Dr. Harry S. Mustard is director. A substantial beginning has been made, further expansion is looked for in the near future, and peace-time developments comprehend new buildings, laboratories and an expanded faculty. An intensive program of graduate instruction in tropical medicine is being provided this spring, and it is expected that in the near future a full year's work will be offered to properly qualified students. In a statement issued by Dr. Mustard he points out that as a component of the College of Physicians and Surgeons, the DeLamar Institute of Public Health provides a foundation for tropical medicine that is essential. There is already available most of the basic resources necessary. In addition, Columbia University, through its relationships with the School of Tropical Medicine in Puerto Rico, is in position to provide advanced students with intensive work in a tropical environment.

THE results of a nutrition survey of Palestine are described in *The Lancet*. The survey shows that there is little obvious undernourishment in Palestine. A Health Department Survey has already shown that part of the urban population is suffering from malnutrition due to poverty. The rural population is believed to be better off now than ever before. The survey is covering the whole country and taking account of both Jewish and Arab communities; it is linked with the school-feeding scheme for Arab children in the larger towns. Children of both groups have suffered more from malnutrition than adults. The most serious dietary deficiencies are of fats and calcium, especially among Arab children. The Jewish school-feeding scheme has improved the nutrition of poor Jewish children and it is hoped that the government plan for providing school meals for Arab children will have an equally good effect. There was less vitamin deficiency than had been expected, since vegetables and fruit in season offer a good source of many of them. Iron deficiency is commoner among the Jews than among the Arabs, who use more iron-containing plants in cooking. An educational campaign, to encourage vegetable growing and conservative cooking, is proposed. Poor housing and high rents contribute to poverty and hence to malnutrition.

DISCUSSION

A NOTE ON THE SEROLOGICAL ACTIVITY OF DENATURED ANTIBODIES

ERICKSON and Neurath have recently given a brief account[1] of their studies of the change in activity, as shown by the precipitation reaction with the homologous antigen SSSI, of horse antipneumococcus antibody when subjected to the denaturing action of guanidine hydrochloride. They observed that their preparations after treatment with the denaturing agent were able to form precipitates with the homologous antigen. They attributed this ability to the regeneration of antibody in the absence of antigen, and suggested that this indicates that "the difference between antibody globulin and normal globulin is not merely one of steric arrangement but probably one of amino acid composition." We believe that a reasonable alternative interpretation of the experiments can be given.

The argument of Erickson and Neurath depends on the implied assumption that in their experiments all the antibody activity of the preparation was initially destroyed by the denaturing agent. This assumption, however, is not supported by direct experimental evidence. Our interpretation of the observations, which does not include this assumption, is the following: We assume[2] that parts of the antibody molecules have such a folding of the polypeptide chains as to give them structures complementary to the homologous antigen, and that the specific activity of the antibody resides in these parts. Under the influence of a denaturing agent such as guanidinium ions an antibody molecule may undergo structural change (unfolding of polypeptide chains, breaking of hydrogen bonds, "denaturation") in any one of many different ways, some of which may and others may not affect the parts of the molecule with specific combining power for antigen; thus the molecule may undergo "denaturation" either with or without destruction of its specific combining regions. Unfolding of polypeptide chains, whether or not it affected the specific combining regions, would lead to some polymerization and decreased solubility; and accordingly it is not a sound assumption that, if antibody structure is due to specific folding of polypeptide chains, decrease in solubility must be accompanied by loss of antibody activity.

On this interpretation the "regenerated antibody" of Erickson and Neurath would consist of those antibody molecules which had escaped extensive unfolding under the action of the denaturing agent, whereas the "irreversibly denatured antibody" would consist of aggregates of partially unfolded molecules, of such size as to be insoluble in saline solution at the isoelectric point but soluble in 2 per cent. sodium thiocyanate solution. The power of combining with antigen shown by each of these fractions we attribute to the presence of undestroyed specific combining regions on the molecules or aggregates. Evidence indicating that the process of destruction of the specific combining regions of antibody molecules by denaturing agents is slow has been obtained in an experimental study of the destruction by urea of the antitoxin activity of diphtheria antitoxin which has been in progress in these laboratories during the past year; an account of the results obtained so far will be published soon.[3]

This picture of the phenomenon suggests that changes should occur in the combining ratio of antibody and antigen, as observed by Erickson and Neurath. It is clear from this point of view that the amount of specifically precipitable protein in a treated antibody preparation can not be taken as a true mea-

[1] J. O. Erickson and H. Neurath, SCIENCE, 98: 284, 1943.

[2] See L. Pauling, *Jour. Am. Chem. Soc.*, 62: 2643, 1940.

[3] G. G. Wright, *Jour. Exp. Med.*, in press.