same characteristics of the blood protozoa listed above permit the direct study of the action of antibodies on the invading protozoa *in vivo*. Thus, when an immune serum is tried curatively, it can be ascertained by direct blood examination whether the organisms are killed or not. Similarly, the action of the reproduction-inhibiting antibody can be observed, that is, the presence or absence of cell-division can be directly ascertained. Here again the only methods available for similar studies with the smaller bacterial invaders are at best indirect.

(3) *The cellular basis of immunity.* The blood protozoa have proved admirable material for the correlation of cellular responses with immunity, antibody formation, etc. Thus, in the study of the production of the reproduction-inhibiting antibody in *T. lewisi* infections, it has been possible to use the trypanosomes as a delicate measure of the activity of the macrophage system. Similarly, in the acquired immunity of birds to malaria it has been possible to correlate the course of infection and immunity with the cellular responses. In fact, the malarial organisms have proven to be particularly advantageous for this type of study not only because they are large and can be easily found in the tissues, but also because even after digestion they leave a landmark for a considerable length of time in the form of the less readily digested pigment.

Lest I be misunderstood as suggesting the use of the blood protozoa for the study of all of the fundamental problems of immunology, I should also like to point out some of their shortcomings. Not even all the blood protozoa can be used for the studies I have presented this evening. Some of them, such as *T. cruzi,* the causative agent of Chagas's disease, form reproductive centers and localizations in the tissues which make the study of the normal course of infection by blood examinations impossible. Others, such as *P. falciparum,* the causative agent of estivo-autumnal malaria in man, although confined to the blood, show localizations in the capillaries of certain organs which thereby prevent the study of the course of normal infections by routine peripheral blood samples. The fact that the protozoa used in these studies are distributed throughout the blood stream prevents their use for studies in local immunity. Finally, inadequate cultural methods eliminate both the blood protozoa in particular and all protozoa in general as good material for the study of the serology and chemistry of immunological processes.

OBITUARY

ASHE, PIONEER FORESTER AND BOTANIST

THE death of William Willard Ashe on March 18, 1932, removes another distinguished name from the fast dwindling ranks of foresters who received their training in an era when the country was without established schools for education in the forestry profession. Ashe was born in Raleigh, N. C., on June 4, 1872, the oldest of nine children born to the Honorable Samuel A'Court Ashe and Hannah Emerson (Willard) Ashe. Ashe was noted as a boy for his love of nature, versatility, originality and for his mechanical and artistic ability. He was educated at the Raleigh Male Academy, the University of North Carolina (B. Litt., 1891), and Cornell University (M. S., 1892), specializing in geology and botany. He studied medicine for a while under Dr. W. I. Royster, of Raleigh. He was a member of the Sigma Alpha Epsilon fraternity. From 1892 to 1905 he served as forester of the North Carolina Geological Survey under Dr. J. A. Holmes. From 1905 until his death Ashe was an officer of the U. S. Forest Service, rising steadily in rank from forest expert and forest assistant to assistant district forester and senior forest inspector in "Region 7" (eastern United States). In 1906 he married a widow and distant cousin, Margaret Henry Wilcox. He had no children. Ashe was secretary of the National Forest Reservation Commission and editor of its reports from 1918 to 1924. He was elected vice-president of the Society of American Foresters in 1919. He became a member of the Forest Service tree name committee in 1928 and was chairman from 1930 to his death.

Ashe was a true pioneer. He was one of the real fathers of the forest acquisition policy of the federal government and was among the first to recognize the need for forest research in this country. He planted one of the first commercial stands of longleaf pine in North Carolina and discovered the secret of its successful transplantation. He is credited with introducing the modern cupping system in the American naval stores industry.

A bibliography of Ashe's scientific papers compiled by the writer covers 166 titles. He wrote extensively on systematic botany, logging costs, profitable forest management, land acquisition for conservation purposes, forest influences and forest types. One of the last papers he issued was a monograph of the genus Polycodium.

Ashe was an indefatigable observer, collector and annotator of plants. He published 510 new names in 35 genera. His taxonomic interests were (aside from his early papers in Asarum and Panicum) largely in connection with woody plants of the Southeast; 86 per cent. of his botanical novelties are in the five

families Rosaceae (including Malaceae), Ericaceae (including Vacciniaceae), Juglandaceae, Fagaceae and Poaceae.

Ashe was a quiet and retiring man, a hard worker, utilizing his personal time largely in study and writing; he was keenly observant, markedly original and independent, with a fine sense of humor, and with high standards of thought and conduct.

WILLIAM A. DAYTON

RECENT DEATHS

DR. WILLIAM W. KEEN, emeritus professor of surgery at Jefferson Medical College, Philadelphia, died on June 7 at the age of ninety-five years.

DR. NATHAN AUGUSTUS COBB, of the Bureau of Plant Industry of the Department of Agriculture, died on June 4 at the age of seventy-three years.

DR. VIRGIL COBLENTZ, of Philadelphia, formerly professor of chemistry in the New York College of Pharmacy and chief chemist of E. R. Squibb and Sons, died suddenly on June 10. He was seventy-six years old.

EDWIN JULIUS BARTLETT, professor emeritus of chemistry at Dartmouth College, died on June 10 at the age of eighty-one years.

HERBERT PARLIN JOHNSON, formerly assistant professor of zoology in the University of California and associate professor of bacteriology in the School of Medicine at St. Louis University, died suddenly on April 29 at the age of sixty-eight years.

THE death is announced on May 29 of Dr. Cuthbert Christy, London naturalist, explorer and expert in tropical diseases. He was sixty-eight years old.

MISS NORA E. DALBEY, associate professor of botany, Kansas State College of Agriculture and Applied Sciences, who was carrying on special work in cytology while on leave of absence, died at Merritt Hospital, Oakland, California, on May 23. Miss Dalbey received her bachelor's and master's degrees from the University of Kansas. She has been at Kansas State College since 1918.

A CORRESPONDENT writes: "Anthony Spuler, associate entomologist of the Washington Agricultural Experiment Station, State College of Washington, Pullman, and Mrs. Spuler were drowned at Lake Wenatchee, Washington, on Memorial Day when their small motor boat capsized in a storm. Mr. Spuler received his bachelor's degree in zoology in 1917 and his master's degree in 1919 from the State College of Washington, and has been a member of the teaching and experiment station staff of that institution since his graduation. He was best known for his work in developing the use of moth traps as an indicator of the time to spray for codling moth control and for his research on oil sprays and other insecticides. Many of the results obtained in his investigations are the bases of established orchard practices in the Pacific Northwest."

Nature records the deaths of R. H. Adie, formerly secretary of the School of Agriculture, University of Cambridge, and the Hon. Mrs. Huia Onslow (Muriel Wheldale Onslow), university lecturer in plant biochemistry in the University of Cambridge.

SCIENTIFIC EVENTS

GIFTS TO THE BRITISH NATURAL HISTORY MUSEUM

AMONG the important acquisitions made by the Trustees of the British Museum (Natural History) and reported in the London *Times* are two considerable gifts from Mr. A. S. Vernay.

Some 60 mammals and 590 birds obtained by the Vernay-Lang expedition to the Kalahari Desert in 1930 have been presented by him, together with 264 flowering plants and ferns from the same region. The mammals include specimens of 11 forms described in South Africa as new to science, and the plant collections, from an area poor in flora and imperfectly known, make a welcome addition to the small representation hitherto possessed by the museum. The second gift from Mr. Vernay consists of 184 mammals, 29 reptiles, 34 fishes and 500 butterflies obtained by Captain Beresford Holloway, who accompanied the donor on his recent expedition to the Malay peninsula.

Other zoological gifts include 70 big-game trophies from India and Africa presented by Sir Richard Dane, and a collection made by Dr. E. B. Worthington during the Cambridge University expedition to the East African Lakes. In this are included 102 reptiles and amphibians, 900 fishes (including about 30 new species), and many molluscs and other invertebrates.

A gift to the Department of Botany is the British herbarium of the late Dr. John Thomas Irwin Boswell (1822–88), presented by Mr. F. J. Hanbury. This herbarium comprises about 20,000 sheets of well-mounted plants, contained in 14 mahogany cabinets. Boswell was the editor of the monumental third edition of the "English Botany," and was long connected with the Botanical Exchange Club as distributor. The accuracy and detail of his descriptions was based upon the material in this collection, which will be kept intact by the wish of the donor, who purchased it on Boswell's death. A collection of 372 Tanganyika