it is because somehow the rabbits were placed there in advance. For this the pure scientist, working behind the scenes, is in large part responsible. The public sees only the play; not the author and the backstage force.

It should not be difficult to find ways and means of educating the public to understand the contributions that pure science makes to world progress. Indeed, various agencies are already working toward this end—newspapers, periodicals, occasionally radio, for example. The public is reasonably responsive to anything which has a utilitarian end. When it becomes generally understood that to expand industry we must have applied science; to have applied science we must have pure science; then pure science will receive increased recognition, and perhaps more adequate support.

But—a utilitarian argument again! Are scientists ready to admit that the only justification for maintaining laboratories for work in pure science is that out of those laboratories may come a few discoveries that may ultimately find industrial applications? I am sure that scientists themselves do not believe so. While they are usually gratified when a scientific discovery does become "useful," as the man-of-the-street uses the term, it is not for that purpose that they carry on research. They believe that science —a knowledge of the universe around us and its laws —should interest the average citizen; that in the scheme of modern society science, pure science, should have a place at least on a par with art and music and poetry. The pictures on the wall do not make the house warmer in winter. Yet it is a poor room indeed that does not have them.

But what are scientists themselves doing to urge this view-point? And who will do it, if not the scientists?

I believe that graduate schools can very greatly extend their services during the next twenty-five years by broadening their own horizons beyond the utilitarian specialization characteristic of the past half-century. By means of that subtle thing called "atmosphere," and in various other ways they can see to it that "doctor of philosophy" means something more than a badge of professional proficiency; and that the holders thereof are men and women who recognize and accept their obligation to help make this a better world in which to live.

OBITUARY

CHARLES E. JOHNSON

IN the untimely passing of Professor Charles E. Johnson on June 6, at the age of fifty-six years, the field of zoology sustains a very real loss.

Born in Oslo, Norway, on April 24, 1880, he came to this country with his parents at the age of two, the family settling near the town of Warren, Minn., on the east side of the Red River Valley. Their arrival was about contemporaneous with the disappearance from that region of the last herd of bison, but Dr. Johnson used to relate how their whitened skulls dotted the prairie for many years afterwards.

After graduating from Warren High School, he attended the University of Minnesota, taking his A.B. in 1906, A.M. in 1907 and Ph.D. in 1912. For brief periods he worked with Dr. Minot at Harvard and with Dr. B. M. Allen at Wisconsin. During this period of university study, he made frequent long trips into the wild, among others a journey to the west coast in 1907, traveling on foot across Vancouver Island. He also took the first motion pictures of animal life in the Superior National Forest during the summers of 1912–1915, as photographer of the James Ford Bell expedition, which films are now in the Museum of the University of Minnesota. He was an expert woodsman, known as a crack shot with the rifle, and in addition a member of the university championship strong man team.

In 1914 he married Miss Jane Wood. After teaching at Minnesota from 1912 to 1918, and at Kansas from 1919 to 1923, he went to the New York State College of Forestry and in 1926 became director of the Roosevelt Wild Life Station at that school. In this capacity he supervised and edited a series of publications on the animal life of New York State which are unsurpassed in the quality and extent of the work which they represent.

Author of about forty contributions to zoology, in his earlier days he published outstanding work on the pharyngeal derivatives of the turtle, but in later years he abandoned embryological and anatomical studies for the field of vertebrate ecology. His papers on the beaver in the Adirondacks and the muskrat in New York are regarded as classics in their field. Throughout his entire life he was a passionate student of wild life, and any excursion into the country was for him an occasion for study and observation.

In photography he found his chief hobby and diversion, producing work which was often accepted for public exhibition. As teacher and scientist, his chief personal qualities were painstaking thoroughness and honesty. In a day when the field of education has become debauched by so much of fad and folly, he was almost unique in his adherence to high academic standards and sound scientific principles. He had no use for opportunism or expediency in any form, and

in his judgments he was guided by his sense of truth and fairness alone.

Modest and retiring by nature, Dr. Johnson never went out of his way to invite the friendship of the many; he cared little for the ordinary run of social amusements, and was too sincere to be the average "good mixer"—qualities which often caused him to be misunderstood by those who were only casually acquainted with him. But he nevertheless had a genuine interest in people, and under an apparently impassive exterior he harbored a keen sense of humor. Those who knew him well will recall that no one could tell a good yarn with better effect or more genuine gusto, and his close associates came to appreciate the real warmth and kindliness of his personality.

He is survived by his widow, their two children and his brother, Arthur M. Johnson, of the University of California at Los Angeles.

JUSTUS F. MUELLER
N. Y. STATE COLLEGE OF FORESTRY

RECENT DEATHS

DR. MARK FRANCIS, dean of the school of veterinary medicine at the Texas Agricultural and Mechanical College and chief of the division of veterinary science at the experiment station, died on June 28, at the age of seventy-three years.

DR. H. C. GRAHAM, president of the New Mexico State Teachers College at Silver City, N. M., died on June 21. Before his appointment as president of the college in 1933, Dr. Graham had served as head of the department of chemistry for five years, and during his presidency he continued his teaching and research in that field. He had gone to the New Mexico college from Eastern State Normal School, Madison, S. D. Dr. Graham was a graduate of Ouachita College and received his doctor's degree from the University of Iowa. He was thirty-six years old.

Nature announces the following deaths: Professor A. A. Bowman, professor of moral philosophy in the University of Glasgow, on June 12, aged fifty-three years; Sir George Hadcock, director of Vickers-Armstrongs, Ltd., and of Armstrong Whitworth, on June 4, aged seventy-five years; and Professor Charles A. King, principal of the Engineering College and Jodhpur Hardinge professor of technology in the Benares Hindu University since 1919, on May 19.

SCIENTIFIC EVENTS

EXHIBITION OF HISTORIC SCIENTIFIC APPARATUS

Nature reports that the Cambridge Philosophical Society has been responsible for the arrangement of a large and interesting exhibition of historic instruments and records which was opened by Lord Rutherford on June 8 and was on view until June 20. Acting on the suggestion and with the help of Dr. R. T. Gunther, of Oxford, an attempt was made to collect together old apparatus illustrating the work of well-known Cambridge men, as well as some of the equipment used by students of natural knowledge in former days. The collection gave an idea of the material instruments by the aid of which scientific progress has been made in the university, and it established contact with the present day by the inclusion of series showing the progress in the design of certain important pieces of apparatus like electrometers, electroscopes, galvanometers, air pumps, slide rules, microscopes and microtomes.

Among the pieces of special interest are the fourteenth century astrolabe believed to have belonged to Dr. Caius, a circular slide-rule designed by William Oughtred and made about 1640, Pepys' Musarithmica, the instruments used by W. H. Miller in making the Standard Pound, and the microscopes of Charles Darwin and of his grandfather Erasmus.

The remains of the equipment of the observatories of Trinity and St. John's Colleges and a number of Maxwell's instruments form important features, while the cabinets of materia medica preserved since the early eighteenth century in the libraries of Queen's, St. Catherine's and St. John's Colleges were shown together for the first time. The microscopes used by Francis Maitland Balfour form another exhibit interesting to biologists.

BOUNDARIES OF NATIONAL FORESTS

BY two proclamations signed by President Roosevelt, new boundaries have been given to the George Washington and the Monongahela national forests. The Monongahela is now confined to West Virginia and administration will be facilitated. The George Washington in Virginia will continue to include for the present some area in West Virginia, but the consolidation will make for improved administration.

Similar action was taken recently when portions of several units further south were combined into a new national forest entirely within Virginia. It was named the Jefferson National Forest. Sections of the Monongahela stretching across the state line into Highland, Bath and Allegheny counties, Virginia, will be detached from the Monongahela and added to the George Washington.

The George Washington National Forest recently was enlarged by consolidation of the old Shenandoah