shall ultimately be able to acquire a social organization as orderly as the constellations of other worlds. In our fight for individuality and freedom in this war and in the peace to come, I do not despair. The experimental method has demonstrated we must use force without stint to show that freedom and political morality as well as personal honesty really pay. We still cherish the faith that the free search for truth by the methods of science has power to rebuild the world and will prevail.

OBITUARY

ERNEST EVERETT JUST

AUGUST 14, 1883, TO OCTOBER 27, 1941

IT is a sad task to write this short memorial of my former student, collaborator and friend, Professor E. E. Just, of Howard University in Washington. His death was premature and his work unfinished; but his accomplishments were many and worthy of remembrance.

Professor Just was of the Negro race and undoubtedly the best investigator in the field of biology that his people has produced in America. In person he was tall and slender, of dignified mien, with fine, sensitive features. He was born in Charleston, South Carolina, on August 14, 1883. His mother, who was a teacher, after providing him with the best elementary education that his state could furnish, sent him to Kimball Union Academy in New Hampshire, where he made a very distinguished record. He then entered Dartmouth College.

Just took his A.B. degree at Dartmouth College in 1907. While there he specialized in zoology under William Patten, made an excellent record in courses, and devoted a good deal of time to a research problem; he was elected to Phi Beta Kappa and received special honors in zoology and history, as well as the only "magna cum laude" in his class. He began his graduate training at the Marine Biological Laboratory in 1909 with the course in marine invertebrates, and in 1910 in embryology. In 1911–1912 he acted as research assistant to the writer on the subject of fertilization and breeding habits in Nereis and the sea-urchin Arbacia. These experiences focussed his interest on marine eggs, which remained the center of his investigations throughout life. His duties at Howard University delayed the completion of his work for the Ph.D. degree at the University of Chicago until 1916. In the meantime he completed six papers, based on work at Woods Hole in the summer. This work was so good, and his efforts during the academic years to improve medical education at Howard and other Negro universities so effective, that as early as 1915 he received the first award of the Spingarn Medal presented annually to "The man or woman of African descent who shall have made the highest achievement during the preceding year, or years, in any honorable field of human endeavor."

He was on the staff of Howard University from 1907 to 1941, since 1912 head of the department of zoology. From 1909 to 1930, with the exception of two years, he spent all his summers in work at the Marine Biological Laboratory.

His first paper (1912) was an interesting study in which he showed by an ingenious method that the plane of symmetry of development is determined by the polar bodies and the point of entrance of the spermatozoon in a meridian of the spherical egg of the annelid Nereis. This was followed by about fifty papers in the next twenty-five years dealing with fertilization and experimental parthenogenesis in marine eggs, mostly of annelids and echinoderms, in addition to a number of theoretical contributions. In 1939 he published two books; the first, on "Basic Methods for Experiments in Eggs of Marine Animals" (89 pp., P. Blakiston's Son and Company, Philadelphia), is an account of the very refined methods that he had developed for work in this field; the second, on "The Biology of the Cell Surface" (392 pp., same publishers), brings together his work and thought in the fundamental field of cellular physiology.

In the twenty summer sessions that Just spent at the Marine Biological Laboratory at Woods Hole he became more widely acquainted with the embryological resources of the marine fauna than probably any other person; and he learned to handle the material with skill and understanding. In consequence, he was in great demand, especially by physiologists who knew their physics and chemistry better than biology, for advice and assistance which he rendered generously. When he withdrew from Woods Hole to work in European laboratories, his loss to the scientific community at Woods Hole was deeply felt.

Just maintained a fine sense of balance in his biological work: he believed that "the study of the state of being alive is confined to that organization which is peculiar to it," but that "life as an event lies in a combination of chemical stuffs exhibiting physical properties; and it is in this combination, *i.e.*, its behavior and activities, and in it alone that we can seek life." These statements are taken from the introduction to his book on "The Biology of the Cell Surface" published only two years before his death. The emphasis in his studies was always on the biological plane, though in his experiments he availed himself intelligently of physical and chemical techniques.

His technical papers were characterized by intimate knowledge of material and use of it in its optimum state; he was thus able to avoid the pitfall of failing to distinguish between results due to unphysiological initial conditions and the real object of his experiments, *viz.*, the effects of altered physical and chemical conditions.

His observations and deductions led him to emphasize the reactions of the cortex ("ectoplasm") of eggs, and to assert their primacy not only in the initiation, but also in the course of development. This is the main theme of his last book. He conceived that the behavior of the ectoplasm is one prime factor in differentiation during development, and the building up of nuclear material another; there is constant interplay of both with the general protoplasm. This led to an interpretation of the action of the gene in heredity, and the conception was even extended to interpretation of evolution. "As the boundary, the living mobile limit of the cell, the ectoplasm controls the integration between the living cell and all else external to it. . . . It is keyed to the outside world as no other part of the cell. It stands guard over the peculiar form of the living substance, is buffer against the attacks of the surroundings and the means of communication with it."[1] Just thus regarded the surface of the cell as something much more than the "semi-permeable membrane" of the physiologists.

Just's scientific career was a constant struggle for opportunity for research, the breath of his life. He was condemned by race to remain attached to a Negro institution unfitted by means and tradition to give full opportunity to ambitions such as his. For this condition no blame is to be attached to the institution, which indeed cooperated by constant and prolonged leaves of absence with Just's friends outside in securing support to enable him to carry on investigations elsewhere. It was due to the National Research Council, Mr. Julius Rosenwald, the General Education Board, the Carnegie Corporation and the Rosenwald Foundation that Just was enabled to spend the greater part of his scientific life during repeated leaves of absence in research, at first largely at the Marine Biological Laboratory, and in the last ten or twelve years in various European laboratories: in Germany at the Kaiser Wilhelm Institut für Biologie in Berlin, in France at the Sorbonne and marine stations and in Italy at the Naples Zoological Station. The successive fellowships and research awards bear witness to the high esteem in which he was held as scientist. All these appointments were limited as to time, and Just never experienced the security of a life appointment adequate to carry out his work.

An element of tragedy ran through all Just's scientific career due to the limitations imposed by being a Negro in America, to which he could make no lasting psychological adjustment in spite of earnest efforts on his part. The numerous grants for research did not compensate for failure to receive an appointment in one of the large universities or research institutes. He felt this as a social stigma, and hence unjust to a scientist of his recognized standing. In Europe he was received with universal kindness, and made to feel at home in every way; he did not experience social discrimination on account of his race, and this contributed greatly to his happiness there. Hence, in part at least, his prolonged self-imposed exile on many occasions. That a man of his ability, scientific devotion, and of such strong personal loyalties as he gave and received, should have been warped in the land of his birth must remain a matter for regret.

FRANK R. LILLIE

[1] "Biology of the Cell Surface," page 366.

DEATHS AND MEMORIALS

DR. WALTER LINDSAY NILES, professor of medicine and acting dean of Cornell University Medical College, New York, died on December 23 in his sixty-fourth year.

DR. WILLIAM PITT DURFEE, emeritus professor of mathematics and emeritus dean of Hobart College, died on December 17 at the age of eighty-six years.

THE death is announced of Dr. Filippo Bottazzi, professor emeritus of physiology at the University of Naples. Dr. Bottazzi was president of the fourteenth International Congress of Physiology which was held in Rome from August 29 to September 3, 1932.

Nature reports the death on November 12, at the age of eighty-four years, of Dr. E. S. Beaven, the agricultural botanist and plant breeder.

A BRONZE plaque has been hung in the main building of the University of Texas School of Medicine, Galveston, in memory of the late Dr. Meyer Bodansky, who at the time of his death in June was professor of pathologic chemistry at the university. He had been a member of the faculty since 1919.

IT is reported in the *Journal* of the American Medical Association that a bronze statue of the late Drs. William J. and Charles H. Mayo in their surgical gowns will be the central point of interest of the Mayo Memorial Shrine to be erected in Rochester by residents of the city and Olmstead County. It will be placed on a granite base before a granite background in the central open space of an amphitheater, symbolic of operating rooms. The shrine, designed by James Earle Fraser, New York sculptor, will be separate from that being planned by the Minnesota Memorial Commission. This commission was ap-