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-

pointed by Governor Stassen late in 1940 to study the establishment of a $250,000 fund for a memorial to the Mayos. State Senator William B. Richardson, Rochester, is chairman of the commission, which is composed of seventeen representative citizens of Minnesota.

SCIENTIFIC EVENTS

AN INDUCTION ACCELERATOR

THE University of Illinois announces that it has arranged for the installation of a machine which opens new fields for scientific exploration and which, as a super x-ray, has important possibilities in medicine, industry and national defense.

It was invented by Dr. Donald W. Kerst, of the department of physics. The machine is the second of its kind, and is ten times as powerful as the first machine, which was built a year ago. Dr. Kerst was given leave of absence to enable him to superintend its construction at the laboratories of the General Electric Company in Schenectady, N. Y.

The machine is called an induction accelerator. It accelerates electrons to an energy of twenty million volts and also emits x-rays of this power. This radiation exceeds that from the existing supply of radium. The x-ray radiation is twenty times as powerful as the x-ray machines now used in hospitals and factories. The machine will be installed at the university in the new Abbott power plant.

With the induction accelerator, electrons are accelerated to a speed nearly that of light—186,000 miles a second.

Dr. W. D. Coolidge, director of the laboratories of the General Electric Company, points out that the induction accelerator provides an important new tool for fundamental research. His statement reads:

> Hitherto, experiments with high velocity electron beams have not kept pace with experiments done with positive ions from the cyclotron. The cyclotron can not accelerate electrons, and previous devices able to do so have seemed to reach a practical limit at something like one fourth the energy output of the new induction accelerator built in the General Electric laboratories for the University of Illinois.
>
> The induction accelerator seems to have no limit. Apparently its effective voltage can be increased indefinitely. It works not by applying the entire voltage at once, but by building up the speed throughout all revolutions.

It is announced that plans are now being considered for an induction accelerator to create 100- or 200-million volts energy.

THE NATIONAL INVENTORS COUNCIL

RECENT short-wave broadcasts from Europe and American responses thereto have centered attention upon the part which inventions are playing in the present war.

In response to this movement, Dr. William B. Coolidge, of the National Inventors Council of the Department of Commerce, stated that the council has already examined more than 35,000 inventions and suggestions during the past year, and that of those examined, several were of extreme import and might possibly affect modern warfare.

The inventions referred to include only those which have been received by the Inventors Council. When consideration is given to the work and achievements of the Office of Scientific Research and Development and of other Government agencies engaged in defense research and development work, it is apparent that the nation's inventive genius is contributing its share to the defense effort.

Lists have been made available by the War Department suggesting fields in which new ideas would be welcome. Among these are:

- Hydrocarbon vapors as an explosive.
- Rocket-propelled projectiles.
- Air, centrifugal and electromagnet guns.
- Automatic mines for land and sea.
- Searchlights, mobile landing-field flood lighting.
- Special automotive equipment for simplifying servicing of motor vehicles and aircraft, and improved motorized repair-shop equipment.
- Improved tank design.
- Better aircraft brakes.
- Light, protective armored clothing.
- Improved automatic anti-aircraft guns and small arms.
- Aircraft catapults and retarding device.
- Ice-prevention devices.
- Refueling equipment.
- Remote-controlled aerial and marine torpedoes, land vehicles and ships, and remote control for other combat weapons.
- Improved gun- and bomb-sights, optical and otherwise.

THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL

THE following statement has been received from the National Roster:

The National Roster of Scientific and Specialized Personnel is now conducting a survey of the senior and graduate students of chemistry and chemical engineering in the universities of the country. It is urged that all persons with training in this or any other scientific or professional field register with the National Roster as soon as possible.

The registers of this organization, containing the