be the star L 97–12, with a luminosity 20,000 times smaller than that of the sun, unless, of course, Van Biesbroeck's star should turn out to be a white dwarf.

Whether these several groups are isolated from each other or whether all the white dwarfs are related in one continuous sequence it is too early to say. In so far as their motions are concerned, the white dwarfs appear to resemble the stars of high velocity, but this was to be expected, since the majority of them were found among the stars of large angular motion.

In their distribution over the sky the white dwarfs do not show any pronounced idiosyncrasies except, perhaps, for a slight concentration near the south pole of the galaxy, but this may be only apparent, or accidental.

Among the most interesting white dwarfs are those which form part of binary systems; ultimately these will become very important, for it is only from the orbital motions of such double stars that we can really determine that crucial quantity—the mass of a star. Sirius is, of course, the classical example and in this case both the orbit of the faint white dwarf around the normal primary and the radio of the masses are accurately known, yielding the only really accurate value for the mass of a white dwarf we possess. In the case of Procyon the mass and luminosity of the faint companion are known, but neither its color nor its spectrum have been observed, and while we suspect it to be a white dwarf because of its much larger mass than expected from its luminosity, we can not be sure. The faint companion to the giant variable star Mira Ceti may be a white dwarf, but if so, it appears to be considerably more luminous than any others now known. One of the components of o_2 Eridani is unquestionably a white dwarf, and while at present neither the orbit nor the mass ratio are accurately known we expect to clear up both these deficiencies in a few decades. In addition to these four systems seven other double stars are known to contain one white dwarf, but in most of these the two components are so far apart and hence the orbital motions so slow that certainly decades and perhaps centuries must elapse before we can accurately determine their orbits and mass-ratios.

To all these may now be added the double white dwarf found by the present writer. To date it is the only double star of which both components are white dwarfs. Situated in the constellation Antlia, nearly 50 degrees due south of the bright star Regulus in Leo, it was first found on Harvard plates to possess the large proper motion of 0".37 annually. Further observations I made at Tucson then showed the star to be both white and double; other plates taken by Baade at Mt. Wilson and Van Biesbroeck at MacDonald, and kindly sent to Minnesota for examination, have led to the following conclusions:

The two components are very nearly equal in brightness, and probably 1,600 times less luminous than the sun; they are both white or blue in color, and would appear to have a diameter smaller than that of the earth. If they are of normal mass, about equal to that of the sun, their density would be of the order of one million times that of water, or about 25 tons per cubic inch. They appear separated by about 4 seconds of arc, which, if our guess as to their distance is correct, would mean about fifty times as far apart as the sun and the earth. Insufficient time has elapsed since the discovery to enable us to do more than estimate the period of orbital revolution at around 250 years. Within the next ten years it should be possible to determine this quantity, as well as the star's distance from us with much precision: from these we shall then obtain the combined mass of the system. In all other binaries involving a white dwarf component the ratio of the masses would also be necessary —and to determine this even approximately would take much longer than a decade—because in all other systems the two components are very dissimilar. In the present binary, however, the two components appear to be so nearly identical in color and in luminosity that one may safely assume that their masses are also virtually equal, and this new double white dwarf therefore seems destined to play an important role in our search for knowledge concerning the white dwarfs.

SCIENTIFIC EVENTS

THE NEW YORK BOTANICAL GARDEN

POST-WAR plans for the greater development of the New York Botanical Garden, in conformity with the post-war plans of the City of New York, were outlined by Dr. William J. Robbins, director, in presenting his annual report on January 16 to members of the Corporation and the Board of Managers. These plans, he pointed out, have occupied much of the time of the staff members and officials of the garden during the past year, and their consummation will provide the means for carrying on more work of world-wide scope in botanical research, as well as providing for the people of New York ornamental displays and recreational and educational facilities in the field of botany and gardening. In the preparation of these plans, the garden has had the cooperation of the Park Department of the City of New York, of Major Gilmore Clarke and of the architectural firms of Aymar Embury II and Skidmore, Owings and Merrill.

The recent rehabilitation of the growing greenhouses

which were partially destroyed by fire late in 1942 was one of the major events of the year, because it means the gradual resumption, starting within a few weeks, of the special floral displays which had been a leading attraction in the main conservatories every winter for a number of years. These displays, in a normal season when the plants could be grown and the people could reach the garden easily, have brought from five to fifteen thousand visitors to the conservatories on a single Sunday. The greenhouse which was damaged was the one in which the display material was being propagated and grown, and since the fire there has been no other place on the grounds where this extensive work could be carried on.

The opening of the new building will also enable the garden to re-establish experimental work and to resume the growing of a large collection of plants of scientific and economic value.

Explorations have been carried out in the tropical regions of the Americas during the year just closed. Dr. Bassett Maguire, curator, returned on November 1 from an eight months' exploring expedition in British Guiana and Surinam. E. J. Alexander, assistant curator, is now directing a six months' expedition for botanical and horticultural material in little known parts of southern Mexico. Dr. W. H. Camp, assistant curator, who is on leave of absence, is collecting specimens of plants in the mountains of Ecuador, while on a Government project in search of cinchona trees for quinine production.

THE ANNUAL REPORT OF THE COMMONWEALTH FUND

IT is stated in the annual report by Barry C. Smith, general director of the Commonwealth Fund, that in the year ending September 30, 1944, the fund appropriated $1,254,988, chiefly for the relief of needs created or revealed by the war, for the long-range encouragement of health services, and for basic research and planning designed to improve health services after the war.

He reports that "In the field of health services conspicuous changes concerning medical practice seem to be in the making. These, although their exact form can not be foreseen, look primarily to the wider and more equable distribution of medical care. If they are judiciously planned and intelligently administered, they may also help to better the quality of medical care. The fund has contributed toward the exploration of these questions through a subvention (voted in 1943) to the New York Academy of Medicine for a study of medicine and the changing order; during the coming year it will publish a series of monographs growing out of this study. The fund will continue to experiment, as it has done for years, with ways and means of bettering the quality of medical care.

"In medical education—obviously a dominant factor in setting the level of medical practice—the situation is confused by the violent adjustments of the accelerated program. Many medical educators feel the need for new teaching methods, new cross-connections between departments in the medical school, new ways of retraining men already in practice. The fund hopes to share in furthering such changes, some of which, on a small scale, it has already helped to initiate.

"In medical research the future is unpredictable. What is predictable is that the growing preoccupation of investigators with underlying physiological patterns—the patterns that may hold the key to understanding and perhaps control of the chronic diseases of middle age and senescence—will continue for many years to justify the wholehearted support of many inquiries that seem, on their face, recondite and even 'impractical.' It is clear, too, that there may be a strong trend toward coordinated research, so strikingly vindicated in the handling of some problems of war medicine and so hard to reconcile with long-established habits in scientific work."

GRANTS OF THE COMMITTEE ON SCIENTIFIC RESEARCH OF THE AMERICAN MEDICAL ASSOCIATION

THE following grants have been made by the Committee on Scientific Research of the American Medical Association:

George Ulett, University of Oregon Medical School, electroencephalograms in experimental focal brain lesions.

Hans Popper, Cook County Hospital, Chicago, liver structure in relation to function tests.

Wilbur Thomas, Bowman Gray School of Medicine, Winston-Salem, N. C., experimental cardiac rupture.

A. M. Lassek, Medical College of the State of South Carolina, effect of paralysis on human pyramidal system.

Archie R. Tunturi, University of Oregon Medical School, acoustic area in cortex of the dog.

Leo Hardt, Loyola University School of Medicine, Chicago, new gastroscope.

David Sandweiss and Thomas L. Patterson, Wayne University College of Medicine, Detroit, relation of the endocrine glands to urogastrone.

Israel Davidsohn, Mount Sinai Hospital, Chicago, problems of Rh factor.

Frederick M. Allen, New York, studies on refrigeration surgery and treatment.

J. LeRoy Conel, Harvard Medical School, postnatal development of the human cerebral cortex.

Herbert S. Kupperman, University of Georgia, pregnancy test.

Theodor E. Bratrud, University of Minnesota Medical School, colored illustrations for article on congenital adrenal hyperplasia.

Wilhelm Raab, University of Vermont College of Medi-