SCIENCE NEWS

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DISCOVERY OF TWO FAINT NEBULAE

DISCOVERY of two new members of our local group of galaxies, vast number of stars whirling through space together, may bring us closer to solving the riddle of how our world came into existence. This brings to thirteen the number of galaxies, close neighbors to our own galaxy or Milky Way, with which we are familiar.

The two faint nebulae, representing previously unobserved stages through which a stellar system passes in changing from a nebula which is either round or elongated in shape into a globular group of stars, are reported by Dr. Walter Baade, of the Mount Wilson Observatory, of the Carnegie Institution, at Pasadena, Calif., in the current number of the *Astrophysical Journal.* Known to astronomers by the New General Catalogue numbers of 147 and 185, the nebulae in structure differ considerably from typical elliptical nebulae which become continually brighter toward the center and gradually get fainter toward the edge.

The pair, Dr. Baade reports, seem to be intermediate in form between systems like NGC 205, in which it is just apparent that the usual distribution of stars in elliptical nebulae is no longer being followed, and the Sculptor and Fornax systems, globular systems where so few stars seem to be grouped together that observers hesitate to claim that they belong to the group of elliptical nebulae.

"It seems that a marked change in the internal structure of the elliptical-type nebulae takes place as we reach the systems of lowest luminosity," Dr. Baade states. The strong concentration of stars toward the center and the central nucleus gradually disappear. In one nebula investigated the central nucleus was faint, in the other it was entirely missing.

For years elliptical nebulae have puzzled astronomers anxious to investigate the secret of their creation. It seemed impossible, even by the most powerful instruments, to photograph the individual stars. It has recently been discovered, however, that when red-sensitive plates were substituted for the blue used hitherto, stars just beyond the reach of the blue-sensitive plates could be photographed.

By means of red-sensitive plates nebulae can now be resolved with the 100-inch telescope if their distance is not greater than 300,000 parsecs or about 980,000 light years. Since this distance coincides with the distance adopted for the outer limit of the local group of galaxies, ability to resolve the nebula into stars provides a convenient criterion by which nebluae within the "family circle" can be distinguished from those outside.

The pair of elliptical nebulae chosen by Dr. Baade are about the same distance from us as the great Andromeda spiral, now visible high in the evening sky, near which they are located. Both systems were easily resolved into stars on the red-sensitive plates, the brightest stars in the groups appearing to be about as brilliant as those in Messier 32, NGC 205 and the inner part of the Andromeda nebula, recently investigated by Dr. Baade.

Showing only an ill-defined elongated patch of faint nebulosity by ordinary plates, under red exposure NGC 147 appears as a large star cloud. Although its shape could only be guessed at before, it now seems to be definitely ellipsoidal in structure. Its absolute magnitude is about the faintest thus far observed in a galaxy, but it is clearly visible because of its nearness to us. Long known to have two dark clouds near the center, on red-sensitive plates the individual stars of NGC 185 can easily be distinguished. Considerably brighter than its companion, the nebula may well be described as a slightly elongated, giant globular cluster of stars.

ITEMS

CONTINUING its "good neighbor" policy of stimulating interest in aviation in neighboring American republics, the Civil Aeronautics Administration, in cooperation with the State Department, recently announced that applications are now being received for 128 aviation training scholarships in 19 Latin American countries under the CAA's fourth Inter-American training program. These scholarships, financed by the State Department, entitle successful candidates to one year of training in the United States at CAA selected schools. Provision has been made under the present program to train 19 pilots, 37 mechanics, 35 communications technicians and traffic control workers, and 37 others who will receive on-the-job training in other aviation activities. Examinations will be given on December 1 and selection of successful candidates will be made by committees in each of the 19 countries. Training will begin in the United States about two months later.

To improve the quality of aerial photos and to make it easier for photo-reconnaissance experts to put together the hundreds of pictures that make up photo montages used by field commanders in planning military operations, a new device times the taking of photos to provide a uniform percentage of overlap in all photos. Known as the intervalometer, it is designed to click the shutter automatically in one or more aerial cameras at predetermined intervals with a range of from 1 to 120 seconds. Developed by the Fairchild Camera and Instrument Corporation, the controls of the new device are installed on the instrument panel of the plane. Cameras which may be back in the tail of the plane can be operated by this remote control system. As many as seven fully automatic aerial cameras are operated in synchronization by one controlling device. In addition, there is an extra-picture switch button, permitting the aerial photographer to take an extra picture if he happens on an unusual subject that does not fall within the interval timing, without interrupting the predetermined scale. A thermostat-controlled electric heater keeps the equipment at uniform temperatures during high altitude flight. The resulting overlap provides the same area coverage in any given strip of pictures. This results in a uniform percentage of overlap in all photos taken from an identical altitude but to different scales.