

University College, London, and flown recently on the satellite Ariel V.

In the April 17 *NATURE* C. J. Eyles, G. K. Skinner and A. P. Willmore of the University of Birmingham and F. D. Rosenberg of the Mullard Space Science Laboratory report the position of the source as right ascension 11 hours, 18 minutes, 59 seconds, declination minus 61 degrees, 35.3 minutes, a location in the constellation Centaurus. J. C. Ives, P. W. Sanford and S. J. Bell Burnell of the Mullard Space Science Laboratory discuss a study of 39 days of its spectral records. Its

period is 6.75 minutes. Both the beamed radiation of a rotating neutron star and the square-wave appearance of the pulses of an eclipsing binary system are ruled out by the quasi-sinusoidal appearance of the new object's pulses. Thus it seems to be neither of those objects. The investigators' tentative suggestion is that the new source is a close binary system composed of two compact objects, instead of a fairly wide binary system composed of one compact object and one normal star as the long-period sources are supposed to be. □

## How black was my body?

It is now about 10 years since radio astronomers began to find that the universe is pervaded by a background flux of microwaves that seems to represent the radiation of a blackbody at a temperature of 3 degrees K. Such radiation can be interpreted as a relict of a big-bang explosion at the beginning of the universe, and its discovery was widely hailed as an important support for the big-bang theory.

But the ultrafastidious have always prefaced their hosannas with a certain caveat: In the radio microwave range the spectrum shows a neat straight line, which can belong to a blackbody but may also be part of a graybody or Rayleigh-Jeans spectrum, which has

nothing to do with the big bang. It was necessary for full certainty to make measurements in the submillimeter range, where a blackbody spectrum would show a characteristic curve. Such a measurement is impossible from the ground, and it has just now been made with balloon-borne equipment.

In the April 21 *PHYSICAL REVIEW LETTERS*, D. P. Woody, J. C. Mather, N. S. Nishioka and P. L. Richards of the University of California at Berkeley and the Lawrence Berkeley Laboratory report that in the range between 2.5 millimeters and about half a millimeter the spectrum is that of a blackbody at 2.99 degrees K. with 90 percent confidence. □

## Whooping cranes survive disease threat



When waterfowl in Nebraska began dying in drastic numbers last week of avian cholera, ornithologists in Texas panicked. Several of the nation's flock of 49 wild whooping cranes, which winter along Texas's Gulf shore, had just left for their nesting grounds in Canada. The cranes customarily stop in Nebraska to rest, and officials envisioned a mass epidemic among the birds. The disease has already killed 15,000 of the Sacramento Game Refuge's 140,000 waterfowl.

When nine of the whooping cranes landed in infected waters April 18, game wardens tried in vain to shoo them off with airplanes, but 36 hours later all nine of the birds took flight voluntarily, seemingly unaffected by

the disease. (The infection kills a bird in 24 hours.) Six more birds from the Aransas Wilderness Refuge in Texas were frightened from the waterways, and only two more cranes, still wintering in Texas, have the flight to Canada to go, says Frank Johnson, manager of the Aransas refuge.

In the early 1940's only two dozen of the birds existed in America, and as a last-ditch effort to save whooping cranes from extinction, biologists established an artificial hatchery, importing eggs from Canada, at Patuxent Wildlife Refuge in Maryland, where a total of 14 experimental birds are studied. For the first time ever, a Patuxent captive crane has laid an egg, due to hatch in 30 days. □

## Soviets help India into the 'space club'

Less than a year after joining the elite nuclear club (U.S., U.S.S.R., France, China), India has joined the only slightly less select membership of the space club (U.S., U.S.S.R., Canada, China, France, Germany, Great Britain, Italy, Japan, the Netherlands, Spain) with the orbiting of its first satellite.

Named Aryabhata, the Indian-built probe was launched from the Soviet Union with a Soviet rocket on April 19, much as the United States has launched spacecraft for nations without their own boosters. One of the major goals of the Indian Space Research Organization, in fact, is to develop a rocket of its own, as well as a national launching facility at Sriharikota on the country's east coast. The booster is envisioned as a four-stage vehicle capable of sending a 40-kilogram payload into a nearly circular orbit about 400 kilometers above the earth. (Such a booster would not have been sufficient for Aryabhata, a 300-kilogram probe whose orbit ranges in altitude from about 569 to 610 kilometers.)

The satellite is a scientific probe, as are most initial space club bids. It is instrumented for X-ray astronomy, a high-energy neutron and gamma-ray search during intense solar activity, electron monitoring in earth's ionosphere and ultraviolet measurements of the night sky.

Soviet assistance was reportedly needed on several fundamental aspects of the satellite such as its stabilization system, on-board data storage and solar and chemical power sources. Nevertheless, Indian officials view the project as, in the words of President Fakhruddin Ali Ahmed, "putting India on the map." An indication of the high priority of Indian space research is that the budget of ISRO doubled between 1967 and 1970, more than doubled again by 1972 and had nearly doubled a third time by the end of last year. The number of workers in the Indian space program has also been doubling about every two years to a present total of more than 8,000.

Besides the satellite and launch vehicle efforts, ISRO has a third major project in the works, which will begin in early August when the U.S. ATS-6 satellite begins a year of service relaying informational television programs through inexpensive community receivers in about 2,500 rural Indian villages. Another 2,500 will receive ground-based rebroadcasts of the programs, which, under the guidance of the Indian government, will deal with such topics as agriculture, health and family planning. □