

## ASTRONOMY

## Doubt Cast on Quasars

Doubt has been cast on the theory that quasars are the most distant objects in the universe by a new study which shows they are relatively close

► QUASARS are considered the brightest and most puzzling objects in the universe. They are also believed to be the most distant, some 10 billion light years away.

However, doubt was thrown on this picture of quasars by Dr. Halton C. Arp of Mt. Wilson and Palomar Observatories. He reported that some quasars are not at the far reaches of the universe but are relatively close, astronomically speaking. These quasars are at least five of the sources of radio waves associated with peculiar optical galaxies.

Dr. Arp has compiled an atlas of actual photographs of peculiar galaxies, published by the California Institute of Technology, Pasadena. When he looked at the positions of these unusual objects with respect to radio sources in the heavens, he found that many of them were about half way between a line joining two of the strong radio emitters.

The central peculiar galaxies for the five known quasars are only some 36 million to 360 million light years away, not many billions, Dr. Arp believes. These quasars are not the most brilliant objects in the universe but they are of

about the same brightness as ordinary galaxies.

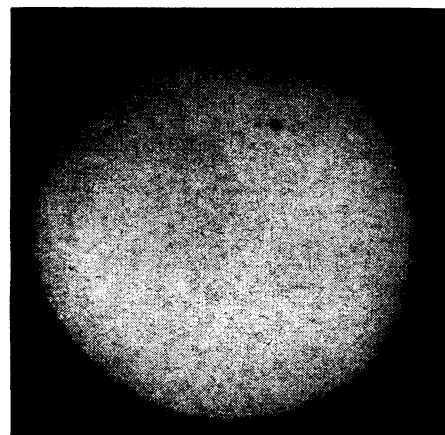
Dr. Arp reported in *Science*, 151: 1214, 1966, that some of the radio sources associated with peculiar galaxies are actually galaxies themselves. This implies that the galactic material was strewn into intergalactic space at speeds of 100 to 1,000 kilometers per second.

After this material had whisked through intergalactic space for 100 million to a billion years, the galaxies and radio sources reached the separations now observed from the central peculiar galaxy.

Therefore, the distances previously attributed to quasars are due either to gravitational collapse, the collapse velocities of clouds of material falling toward the center of compact galaxies or to a cause yet unknown, Dr. Arp believes.

If this is so, Dr. Arp said, the distances now attributed to ordinary galaxies "should be regarded with slightly more caution." He noted that the cause and mechanism of the ejection of material from the galaxies may be connected with their formation, and must also affect the composition of intergalactic space.

• *Science News*, 89:215 April 2, 1966



U.S. Naval Observatory

**HUGE SUNSPOT**—The largest sunspot of the current cycle, the black dot on the sun's surface as seen by the naked eye. It measured about 37,000 miles in diameter at its height.

## ASTRONOMY

### Largest Sunspot Of New Cycle Makes Bow

► THE LARGEST sunspot of the new cycle made its appearance on March 15 and moved off the sun's visible surface on March 28.

It caused some increase in earth's magnetic activity. The sunspot was the biggest so far of the present cycle in which the first solar blackmarks were seen in October 1963.

The current sunspot, which may increase in size or disappear while it rotates around the "far" side of the sun, measured about 37,000 miles in diameter at its largest.

• *Science News*, 89:215 April 2, 1966

## PHYSICS

### Nuclear Blasts Seen Scientifically Important

► NUCLEAR BOMBS exploded high in the atmosphere have many scientific uses, providing a completely new tool for investigating energies and intensities of radiation far greater than previously possible.

However, because such tests produce radioactive debris that contaminates earth's air for days and years, they have been banned by international agreement since December 1962.

Dr. D. W. Dorn of the University of California's Lawrence Radiation Laboratory believes an international agency would be able "to weigh the advantages and disadvantages of such experiments in a dispassionate way."

Nuclear explosions are not only a new tool for investigating earth's atmosphere but also simulate briefly the conditions in the stars.

Dr. Dorn thinks that nuclear detonations can be used to test theories about systems as large as the universe or as small as the atomic nucleus. His report on the possible scientific uses of nuclear blasts appeared in *Discovery*, 27:26, 1966.

• *Science News*, 89:215 April 2, 1966

## SPACE

## Study Mars With Photos

► CLOSE-UP photographs taken on the surface of Mars are the best way to discover whether or not that planet has life including even the remotest possible widely publicized "unimaginably strange creatures," a report by the Space Science Board of the National Academy of Sciences said.

It was "not intended and does not suggest" that such creatures actually exist, Dr. A. H. Brown of the University of Pennsylvania, chairman of the working group preparing the report, told *SCIENCE SERVICE*.

The phrase was used to illustrate how little is known about Mars, thereby emphasizing the high value of taking pictures from the Martian surface.

The National Academy report stressed that photographs would show much more certainly than chemical tests, either direct or indirect evidence of life or living forms, especially such changes as might be caused by vegetation over a period of time.

If the pictures are at least of average quality, and those sent back from the Mariner IV Martian probe were much better than average, the chances of detecting life are good, the Board said.

The Board therefore urged that photographic reconnaissance play an important role during the early as well as the advanced stages of Martian exploration. It called for "prompt attention" to development of techniques for including picture transmissions from Mars in the payloads for the Voyager probes.

The report emphasized that the "investigation of possible extraterrestrial life, especially on Mars, is a scientific enterprise of historic importance." It called for "strict sterilization" of any capsules to be landed on the Martian surface, in order to prevent contamination of the planet and to preserve any possible biological or prebiological material.

• *Science News*, 89:215 April 2, 1966