

## RADIO ASTRONOMY

**Discover Radio Waves Absorbed by Nebula**

► DISCOVERY that radio waves are absorbed by one mass of glowing gas in the heavens known as an emission nebula was reported by three Australian radio astronomers.

The Australian discovery means that radio astronomers can isolate individual objects by their absorption of certain energy bands in the radio region, just as optical astronomers now analyze a stellar composition by absorbed light.

Although only one emission nebula, NGC 6375, has so far been thus isolated, larger radio telescopes now being built or planned should result in similar discoveries for other objects.

Drs. B. Y. Mills, A. G. Little and K. V. Sheridan of the Commonwealth Scientific and Industrial Research Organization, Sydney, Australia, report the first case of absorption of radio waves by an emission nebula in *Nature*, (Jan. 28).

They used the 1,500-foot radio antenna at Sydney to study 14 nebulas at a wavelength of three and a half meters, or about 11 and a half feet.

Shortest radio waves from commercial AM stations are measured in hundreds of feet.

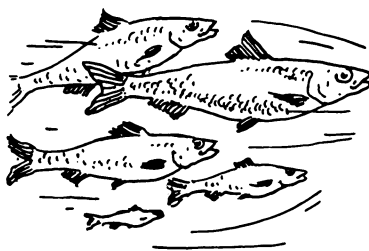
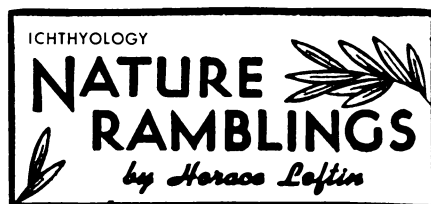
Six were observed in emission, seven were not detected at this wavelength, and NGC 6357 was found to be an absorber.

Astrophysicists thus have a method of learning about the physical characteristics of emission nebula without depending on optical measurements, made unreliable by obscuring dust between the earth and such objects.

The Australian scientists estimate the nebula's temperature as 6,500 degrees Kelvin, somewhat lower than usually assumed from optical measurements.

Position of the nebula, they found, was in good agreement with previous optical sightings and with its location based on radio waves about an inch long, which only last year scientists at the Naval Research Laboratory, Washington, D. C., discovered were being broadcast by the object. (See SNL, April 16, 1955, p. 243.)

Science News Letter, February 11, 1956

**Fish Schools**

► FISH IN SCHOOLS have much in common with children in schools. So long as there is order among them, each facing the front attentively and in his given place, then "schooling" can be accomplished. But when the bell rings for recess and they each dash off in an independent direction, even though they stay in the "school room," then you have only an "aggregation," not a school.

A true school of fish is a group in which all of the individuals are facing in a common direction, parallel to one another and regularly spaced. They should be moving at a uniform rate of speed. In an aggregation of fish, on the other hand, the group is attracted together but is not uniformly spaced or directed.

There may be "false schooling" on occasion, when an aggregation of fish line up in the same direction in response to a water current. One scientist, experimenting with the sunfish, *Lepomis*, found that his test fish all faced the flow when a current was started in their tank, but they broke up as soon as the current was stopped—something like the recess bell!

This scientist, Dr. James W. Atz of the New York Zoological Society, believes fish that cannot see one another will not school, nor even form aggregations. Vision plays

the dominant role in fish schooling, he suggests, with other senses like touch and smell having lesser parts.

How do fish form schools? There are many guesses, and here are two of the best.

First, two or more fish swim towards each other, coming into visual range. When this happens, they line up in parallel paths to keep each other in the desired close range. A certain antagonism, however, operates to keep them a minimum distance apart.

Another idea is that schooling fish use each other as visual reference points, to help locate themselves in the empty space of water. Typical schooling fish are usually those of the open sea, where there is practically nothing—save another fish—for a constantly moving fish to fix upon to give himself a sense of location.

Do schooling fish have individual leaders? Only with the tunas has it been established with reasonable certainty that there are "teachers" in fish schools.

Science News Letter, February 11, 1956

## BIOCHEMISTRY

**Drug Permanently Excites Mice**

► A CHEMICAL so exciting that one or two injections make mice run continuously for the rest of their lives, except when they sleep and eat, is under study at the Allan Memorial Institute, Montreal.

The chemical is a nitrile compound, iminodipropionitrile. The continuously running mice are being studied by Dr. H. Azima of the division of psycho-pharmacology.

Because the mice stop running long enough to eat they do not lose weight. The running may go on, however, for two and a half years, or until the end of the mouse's life.

Whether this drug could safely be given to patients who need to be aroused from trance-like states of mental illness cannot yet be told. Further tests on larger animals such as monkeys are needed to determine whether it would be safe.

Meanwhile Dr. Azima has given the mice some of the new tranquilizing drugs. These slow them down and they do not run quite so much or so vigorously.

Science News Letter, February 11, 1956

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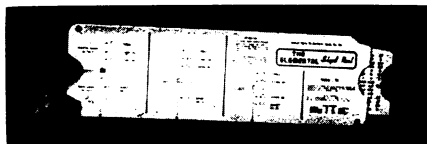
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