

ASTRONOMY

Tell Future of Stars

Electronic computer being used to help spell out the life history of stars. Data of supposed conditions long ago are fed to machine and compared with present observations.

➤ A KIND of combined astronomical "archaeology" and "fortune-telling," in which atom smashers and a giant electronic "brain" join forces, is helping University of California scientists spell out new details of the life-to-death history of stars.

This approach to the study of stellar evolution has already yielded new evidence that stars are being formed all the time. Problems about the way matter behaves at high temperatures have been uncovered. And the future of the research model, Sirius, the Dog Star, has been predicted for about a billion years.

Right now the scientists are working out the evolution of the sun, and probably will apply their method later in studies of other stars in various stages of development.

The researchers are Drs. Louis Henyey and Karl-Heinz Boehm, and two physicists, Dr. Robert Le Levier and Richard Levee, both of the Livermore site of the Radiation Laboratory, operated by the University for the Atomic Energy Commission.

The method of the scientists is simple. They feed the Livermore UNIVAC data proposing the chemical and physical conditions that may have existed when the star was formed. They add other data, some of it obtained from atom-smashing experiments, about the physico-chemical reactions that take place inside stars.

Then the scientists let UNIVAC work out the reactions that take place in a period of millions of years. These calculations would take months by other methods, but UNIVAC solves them in minutes.

When the machine brings the star up-to-date, the scientists compare the results with known conditions. If the comparison is

good, the scientists know that details worked out about the star's earlier history are correct. And they can work on the star's future with some assurance of accuracy.

The scientists have shown that Sirius is somewhat less than 100 million years old which is much younger than the earth. Since it was formed much later than the creation of the universe around five billion years ago, the results suggest that stars are being born all the time.

According to the new case history of Sirius, it apparently was formed from a primordial cloud of dust and gas. Soon after its formation, Sirius was only half as hot, about 150 times bigger in volume, and yellowish instead of white.

It was radiating energy at a tremendous rate, contracting and heating up. Soon the temperature rose enough to support thermonuclear reactions, in which hydrogen atoms fuse into helium atoms.

Sirius apparently has about 500 million years to go to deplete the hydrogen at its core. At the end of that time, its core will have expanded about one and one-half times over its present size, and it will turn yellow again.

The scientists followed the future of Sirius for several hundred million more years, when they ran into a new type of thermonuclear reaction, in which helium may begin to fuse into carbon.

At this point the California researchers encountered new problems in physics and chemistry that must be solved before any serious speculations can be made about what happens next.

Science News Letter, September 10, 1955

ICHTHYOLOGY

Isaak Waltons Need Bulbs in Bait Box

➤ FISHERMEN will be taking along electric light bulbs for bait soon.

Norwegian technicians have devised a metal container with four windows through which an electric light shines. Lowered into the water, the light attracts fish to swim close to the apparatus.

The lower part of the container, lying in darkness, is equipped with hooks. When the gear is jerked upward, the dazzled fish are caught, theoretically.

This is one of several uses for the "light ray fishing sinker," the U. S. Fish and Wildlife Service said, reviewing a report of the apparatus from the *Norwegian Fishing News* (Vol. 2, 1955).

In trawling, several of the light ray sinkers are placed on a special hoop set at the mouth of the trawl net. The fish, attracted to the light, gather in front of the net, thus considerably increasing the catch.

The gear was tried in the Pacific and in salmon fisheries, the FWS said, and catches were promising. Production of several thousand light ray sinkers a week is scheduled.

Science News Letter, September 10, 1955

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NUTRITION

Keep Vegetable Flavor: Blanch Before Freezing

➤ VEGETABLES will taste better and look better if you blanch them before freezing, food scientists at the New York State Agricultural Experiment Station, Geneva, N. Y., advise.

Off-flavors in frozen vegetables come from the action of digestive chemicals, called "enzymes," which cause the small amounts of fatty materials in plants to turn rancid.

Blanching destroys or inactivates the enzymes so that the vegetable fats are not attacked, and the fats keep their characteristic qualities and flavor intact. Coloring matter also remains unchanged when vegetables are properly blanched.

Science News Letter, September 10, 1955