

## ASTROPHYSICS

# Sun Younger Than Galaxy

**Propose solar system formed about five billion years ago, compared to about seven and a half billion years for age of Milky Way, on basis of uranium isotope measurements.**

► THE EARTH and other solar system objects are two and a half billion years younger than the Milky Way galaxy, the giant pinwheel of stars in which they are found.

This is true if the elements of which the earth is composed were built up gradually, not formed in a tremendous primeval explosion, four scientists report.

They date the formation of the solar system as about five billion years ago, compared to seven and a half billion years for the Milky Way.

The Milky Way's age is based on the presently-found proportions of two isotopes of uranium, the rare uranium-235 and the relatively common uranium-238. These two were formed in approximately equal proportions at the time of the origin of the galaxy, the scientists calculate, although now found in the proportion of about one to 140.

When separated from the abundant isotope, uranium-235 is easily fissioned by slow neutrons and is, therefore, a desirable fuel both for atomic bombs and nuclear reactors.

Recent evidence, the four astrophysicists state, indicates "the elements have been and are still being synthesized by stars." Thermal cooking in hot stellar interiors can account for the build-up of all presently known elements as well as some heavier than uranium.

The four describing the origin of the elements in *Science* (Oct. 5) are Dr. F. Hoyle of St. John's College, Cambridge University, England, a visiting astronomy professor at Mount Wilson and Palomar Observatories in California; Dr. William A. Fowler, physics professor at California Institute of Technology's Kellogg Radiation Laboratory; Dr. G. R. Burbidge of Mount Wilson and Palomar Observatories and his wife, Dr. E. M. Burbidge of the Kellogg laboratory.

Three separate processes are used in the build-up of heavy elements in stars, they conclude. One is the capture of neutrons in a fast process on a time scale of 10 to 100 seconds, another the slow process associated with giant stars that evolve in about 100,000 years. The third is the "rare" proton-capture process.

The processes described by the scientists supplement the stellar reactions of ordinary thermal cooking, the conversion of pure hydrogen into helium in the so-called "carbon stove" reaction described by Dr. Hans Bethe.

The new effects arise when the cooking is not of pure hydrogen, but of hydrogen mixed with small proportions of the heavier and most abundant elements, those up to and including iron.

Stars being born condense from material lost into space by older stars. This can account for the observed differences in the abundances of elements between young and ancient stars.

Science News Letter, October 20, 1956

## HEMATOLOGY

## Geiger Counter Over Heart Measures Work

► THE HUMAN HEART'S OUTPUT of blood can be measured with 94% accuracy in a few minutes by a technique in which, among other things, a Geiger counter is placed over the heart.

The technique was reported by Drs. Robert E. Zipf, Joe M. Webber and G. Richard Grove of Miami Valley Hospital and Dr. Terence McGuire of the Aero-Medical Laboratory, Wright Patterson Field, Dayton, Ohio, at the meeting of the American Society of Clinical Pathologists in Chicago.

Radioactive iodine mixed with blood plasma is injected into the blood stream. The Geiger counter over the heart records the time the radioactive iodine goes into the heart, the time it stays there and the time it leaves the heart.

This gives a quick safe measure of the heart's output rate, from which doctors can calculate its work ability.

Studies of lung disorders and lung cancer might also be made by a further application of the techniques, the Ohio researchers said.

Science News Letter, October 20, 1956

## VETERINARY MEDICINE

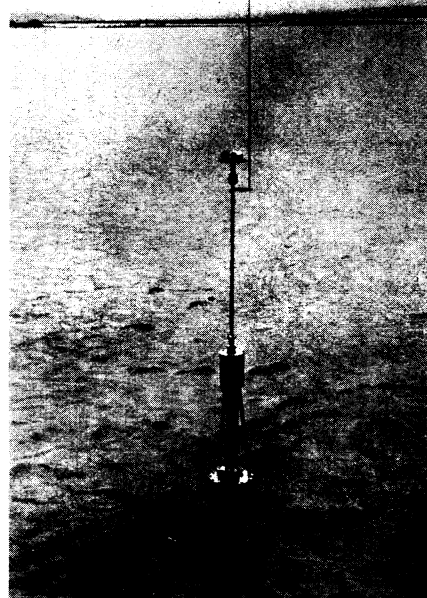
## Devise Treatment for Fatal Chick Disease

► BABY CHICKS can be saved from the fatal disease cecal coccidiosis with a combination treatment of aureomycin and sulfamethazine.

U. S. Department of Agriculture scientists report the combination treatment is 100% effective. The most favorable results with the drugs were achieved from feeding afflicted chicks 100 grams of aureomycin per ton of feed with 0.125% sulfamethazine.

The experiments also showed that treated chicks gained weight faster than healthy chicks fed without the drugs. Chicks affected with the disease usually show no symptoms until the fourth day of infection and then die on the fifth day.

Science News Letter, October 20, 1956



**HURRICANE BUOY**—The U. S. Navy has launched several of these buoys, developed for the Bureau of Aeronautics by the National Bureau of Standards and the Naval Research Laboratory, along known hurricane paths off the southeast coast of the United States. The free-floating buoys will broadcast regular weather reports to aid in detection and location of hurricanes.

## ANIMAL NUTRITION

## Cow Gives Vitamin B-12 Regardless of Her Diet

► COWS give anti-anemia vitamin B-12 in their milk, regardless of what they eat, so long as they eat enough cobalt.

The breed does not make any difference. Holsteins and Jerseys give practically the same amount of the vitamin in their milk.

The reason is that the bacteria in the cow's rumen synthesize the vitamin, U. S. Department of Agriculture scientists report.

Pasteurization does not destroy the vitamin. Neither does storage in a household refrigerator for three days.

Cheese also contains the vitamin. Natural Swiss cheese has the highest count for this vitamin among cheeses tested. Next comes natural Cheddar, either mild or sharp. Then come processed Swiss cheese, processed Cheddar and cottage cheese.

The great vitamin B-12 content of Swiss cheese is believed due to synthesis of the vitamin by propionic acid bacteria involved in the manufacture of this cheese.

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