ASTRONOMY

Gigantic Stars Discovered

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➤ GIGANTIC STARS that would engulf a large part of our solar system exist in other parts of the universe.

Dr. Harlow Shapley, director of Harvard College Observatory, suggested the existence of this new kind of star to the Mexican Scientific Congress held in Mexico City as a part of the 400th anniversary of the National University of Mexico.

This strange kind of heavenly body, as gigantic as the orbit of Jupiter, is believed to exist because of the photometric analysis of light given off. Dr. Shapley suggested that these stars have a very hot and brilliant center with an outer shell of less dense matter. The shell is some 500 million miles from the center. Between the shell and the center, the matter in the star is so sparse that it is less dense than the best vacuum that can be created here on earth.

Less than a thousandth of the star's substance is contained in the outer shell which is kept at such remote distance from the center through radiation pressure and gravitational attraction.

Most of those stars discovered are so far away that it takes light 80,000 years to reach from them to the earth. They are in the large Magellanic Cloud which is a galaxy of billions of stars much like our own Milky Way galaxy in which our sun is a rather ordinary star. Some such stars are also in the small Magellanic Cloud.

The newly discovered giant stars must be from 10,000 to 50,000 times as bright intrinsically as our sun. So large are these stars that some may not wish to call them star but consider them some other form of sidereal object. Their spectra shine like those of more normal stars, however.

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Photographs of these supergiant stars are obtained when the keen and modern telescopes of Harvard Observatory's South African station near Bloemfontein, Orange Free State, take pictures of the immense stellar aggregations that exist at great distances out in space.

Dr. Shapley gave his preliminary report on the superstars in Mexico because the Mexican Astrophysical Observatory at Tonanzintla, in the state of Puebla, is engaged in a cooperative program with a very modern telescope. His full report will be made to the National Academy of Sciences meeting at Yale in November.

Science News Letter, October 13, 1951

NATURAL RESOURCES

Benzene from Shale Oil

➤ BENZENE, IMPORTANT chemical in the manufacture of synthetic rubber, can be obtained in large quantities from the same Colorado oil shale that is now producing heating oil and gasoline. The same shale will also yield other important chemicals such as solvents, waxes, asphalts and tars.

Benzene is one of the strategic materials now in short supply. Last year the United States used approximately 190,000,000 gallons. While the larger part was used in making rubber, much was employed in making synthetic phenol for plastics, aniline for dyes, in nylon, DDT, aviation gasoline, detergents, solvents and many other products. The demand for benzene is far greater than the present supply.

The potential value of oil shale as a source of important chemicals to meet short supplies was emphasized by J. H. East, Jr., of the U. S. Bureau of Mines at Laramie, Wyo. This local laboratory of the Bureau is concerned with oil shale and its products.

Until recently, benzene was available only as a by-product of coke-oven operations. Now new plants are under construction to produce it from petroleum. The demand is so much greater than the supply that synthetic toluene plants built during World War II are being reactivated and converted to benzene production.

An oil-shale plant operated to recover benzene would produce also a large amount of ethylene, a chemical with many industrial applications, Mr. East stated. These include making ethyl alcohol, ethylene glycol for anti-freezes, synthetic rubber, plastics, aviation fuel, antiknock fluid, explosives, refrigerants and many other products.

At the Bureau's Oil-Shale Laboratory at Laramie, a unique process is under development for retorting oil shale to produce high yields of critical chemicals. It is a high-speed, high-temperature process to convert fine shale almost instantly under intense heat ranging from 1,200 to 1,800 degrees Fahrenheit. It offers particularly an attractive means of using the up to 10% of the crushed shale that is too fine for normal retorting operations and is now discarded as waste.

Science News Letter, October 13, 1951

BOTANY

College Ivy Grows Fast—One Inch Every Ten Hours

➤ IT TAKES practically no time at all for an ivy-clad college to get that way. Ivy grows at the rate of about an inch every ten hours.

Turning aside from the more weighty and complex research problems of Harvard University's department of biology, Sumner Zacks leaned out the window and measured the growth of a single shoot of ivy once every 12 hours for four days. When he began it was less than an inch long. Four days later it was almost ten inches long. Measurements were made with a millimeter rule.

At that rate, it would take a shoot of ivy two years and 60 days to grow from the ground up to the top of the Empire State building's new television tower. Mr. Zacks reported the results of his research in the journal, SCIENCE (Sept. 28).

Science News Letter, October 13, 1951

NUTRITION

Children Use More Energy Than Adults in Dishwashing

➤ BOYS AND GIRLS spend, on the average, 39% more energy washing and wiping dishes than grown-ups spend at this same job. Boys doing what is considered light carpentry use a little more energy than grown men doing heavy carpentry. And when Sister sews, she uses up 25% more energy than it would take her mother to sew the same button or seam.

Standing at the blackboard drawing or working problems takes an energy expenditure for children of from 76% to 125% more than their basal energy expenditure. The basal energy expenditure is made up of the calories required by the body at complete rest.

Energy expenditure figures, important for calculating how many calories in food must be eaten, are usually reported for grown-ups at rest and at various kinds of activity. The figures for children have been worked out by scientists at the Nutrition Laboratory, Teachers College, Columbia University, in collaboration with the U. S. Bureau of Human Nutrition and Home Economics. The various studies are summarized in NUTRITION REVIEWS (Oct.), published by the Nutrition Foundation in New York.

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