ASTRONOMY

Tiny "Stars" With Life

Cool dark Lilliputian stars in the vast spaces beyond the solar system have conditions suitable for the origin and maintenance of life, Ann Ewing reports.

➤ THE VAST reaches of space beyond the solar system are sprinkled with millions upon millions of unseen tiny "stars." Many of these dark cool objects have conditions suitable for life.

The Lilliputian stars cannot be observed from earth now, even with the most powerful telescopes. However, instruments to detect them are expected in the future.

Thus the nearest life outside earth, except for possibly the planet Mars, could be on such dark stars. They would have crusts warm enough to maintain water in a liquid state, to support the living organisms on their surfaces.

These are the suggestions of Dr. Harlow Shapley, retired director of the Harvard College Observatory, based on his analysis of the process of star birth. He proposes that the space between visible stars is populated with "myriads of independent celestial bodies." These dark objects have masses between one-tenth and one-thousandth that of the sun. That places them about half way in size between the giant planets, such as Jupiter, and the sun.

Dr. Shapley believes the ordinary stars visible in the night sky or photographed with telescopes are but a "small minority" among those that condensed out of the primeval gas clouds from which the known universe is believed to have formed.

These undetected objects wander through space, instead of traveling in a path around a star, as the earth and other planets in the solar system circle the sun. However, even in the cold and dark of interstellar space, in complete absence of effective visible radiation from a neighboring star, the tiny stars can be suitable for the origin and maintenance of living organisms.

Modern astrophysical (physics of stars) and biochemical research indicates that evolution of life is a natural and inevitable product of cosmic evolution.

The heat necessary to keep water liquid and maintain life would come from internal heat sources, such as the object's gravitational pressure. As Dr. Shapley explains it:

"At some mass, however, between that of Jupiter and the dwarf red stars, the surface temperature must be right for a permanent crust to form and for water molecules to appear in a liquid state—not steaming hot, not frozen cold. Then something momentous can and undoubtedly does occur.

"Slowly but inevitably, with lightning playing on the primitive atmospheric gases, natural chemical reactions produce amino and nucleic acids—the forerunners of proteins, of biological cells and of organisms."

Dr. Shapley points out that cosmic numbers are big enough and cosmic time is long enough to permit even very infrequent reactions to occur abundantly. The chemical make-up of a lightless, crusted star, or self-warming planet, must be much the same as in the sun or the planets of the solar system. Chemistry through the known universe is believed to be everywhere the same.

However, the biochemistry on such dark objects would be "strange" by earth standards. Sense organs might detect long wave radiation or magnetic fields. And the photosynthetic process by which the green leaves in earth's plants change the energy of sunlight into food would be of an entirely different kind.

To detect such stars, or brobdingnagian planets, Dr. Shapley proposes using the techniques of radio astronomy, since some of them would likely radiate inch-long radio waves.

The most acceptable theory of the origin of the sun's system is that the sun, earth and other planets condensed from a great cloud of dust and gas. Dr. Shapley then asks why the sun is just so big, and how much larger or smaller than the sun stars can be.

He reasons that if both Jupiter and earth (one-thousandth and one-three-hundred-and-thirty-thousandth of the sun's mass, respectively) could condense from a primeval gas cloud, "all sorts and sizes of end products" should exist.

It would be reasonable to expect many more Lilliputian stars than those of sun-like mass. The smaller the objects are, the more numerous they should be, down to a size where gravitation does not hold the proto-planet together.

Dr. Shapley suggests that the hundreds of sources of radio waves, which have been detected but not identified with any visible object, could be cool dark stars that steadily send out their low temperature radiation from weak energy sources.

MEASURING RADIOACTIVITY— Dr. Dogan Kizilay adjusts the probe of a scintillation detector to measure radioactivity pickup in a patient's regional lymph nodes as part of a study of oral cancer and the lymphatic system. The research is conducted at the Murry and Leonie Guggenheim Foundation Institute for Dental Research at the New York University Dental Center.

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ASTRONOMY

Space Travel Simulated In Planned Planetarium

➤ A NEW PLANETARIUM, which can show the heavens as viewed from various points in space, is under development by the Spitz Laboratories for Michigan State University in East Lansing.

The new intermediate space transit planetarium (ISTP) will vary from the conventional "earth-bound" planetariums by allowing the viewer to see the sky as it appears from the earth, the moon or outer space. Sections of the sky of greatest interest can be projected onto the part of the dome most easily seen by the audience.

Conventional projectors show how the sky would appear from any place on earth, allowing ancient or future skies to be viewed or reviewed. They show the circling of planets and the moon and the changes in the constellations. But ISTP will show these and, in addition, the universe as space travelers will see it.

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MEDICINE

Effect of High Salt Diet On Blood Pressure Varies

➤ IT DEPENDS on the family, be it mice or men, whether or not a high salt diet will raise the blood pressure.

Three resereachers at the Medical Research Center, Brookhaven National Laboratory, Upton, N.Y., reported in Nature, 194:480:1962, that there is considerable evidence of a familial trend in human essential hypertension.

Twenty-three male and 24 female rats, selected for inbreeding, demonstrated that genetics plays a part in determining whether or not the offspring will have high blood pressure when fed high salt diets.

"It seems reasonable to expect that similar genetic factors operate in man," the researchers said, adding that it would be illogical to expect all individuals on similar salt intakes to have similar blood pressure.

Some persons on low salt intake will have high blood pressure, they pointed out, but others can consume large amounts of salt and maintain normal pressure.

Dr. Lewis K. Dahl, with Martha Heine and Lorraine Tassinari, reported the findings.

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