

RADIO ASTRONOMY

U. S. Probe to Scan Venus

A space probe with radio telescopes is planned to determine if the surface of Venus is more than 600 degrees hot or about the same as on the earth's surface, Tove Neville reports.

► THE UNITED STATES is planning to send four small radio telescopes in a space probe to explore the mysterious planet Venus. This will be the first time radio telescopes have been launched from earth.

The radio telescopes' measurements of the radio spectrum of the planet can settle whether the hot temperatures of more than 600 degrees Fahrenheit, now calculated for Venus, exist on the surface as well as in the atmosphere of the planet.

Dr. A. E. Lilley of Harvard University, Cambridge, Mass., told the International Astronautics Congress in Washington, D. C., that the telescopes will operate on wavelengths from 20 millimeters down to four millimeters.

The probe will be able to do a job close to the planet that no radio telescope on earth can do. Dr. Lilley told SCIENCE SERVICE the probe would show a bright edge around the planet if the surface of the

planet has a temperature comparable to that on earth and the high temperatures are concentrated in the ionosphere of Venus.

However, if the "greenhouse effect" binds the sun's heat to the planet, creating high temperatures both on the surface and all through the atmosphere, then the edge of the planet will be "seen" by the space probe as darker than the center.

Dr. Lilley said that if the surface of Venus is no hotter than the earth's, the hot temperatures in its ionosphere will be due to high densities of electrons.

This space probe will be part of the U.S. Mariner program of probes to Mars and Venus, Dr. Lilley said. He also reported that a radio telescope will be launched in a satellite to measure the properties of the oxygen molecule 30 to 80 miles up in the earth's atmosphere by microwave spectroscopy.

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SPACE

Break Language Barrier

► A WORLD-WIDE network of communication satellites could cut down the 6,000 languages now believed to exist in the world to three: English, Mandarin and Russian.

This was suggested by the British physicist and fiction writer who foresaw communications satellites in 1945, Dr. Arthur C. Clarke of Clarke-Wilson Associates, Colombo, Ceylon.

He told the International Astronautical Congress in Washington, D. C., that global TV could be the greatest force yet discovered for breaking down the language barriers that prevent communication between men.

Dr. Clarke pointed out that of the multitude of languages existing, only seven are spoken by half the human race. First on the list is Mandarin, spoken by 15% of all mankind. English is second with 10%. On the five percent level are five languages: Hindustani, Spanish, Russian, German and Japanese.

However, these are mother tongues, and far more people understand English than any other language. Dr. Clarke believes that unless a synthetic language comes into use the choice will be between Mandarin, English and Russian.

Another revolutionary development foreseen by Dr. Clarke is a complete change in man's living pattern caused by global communication and an enormous, rapidly increasing amount of knowledge. Since man cannot do away with time he must learn to use it to greater advantage. He will be

able to contact anyone at any time of day and night by satellite telephone or person-to-person TV. However, sleep will interfere with communication around the globe, such as between New York and Bangkok, since one city will have daylight while the other lies in the darkness of night.

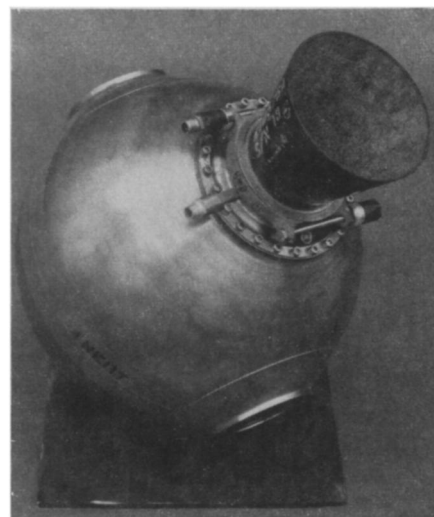
The answer, says Dr. Clarke, is less but more profound sleep. He said that in the USSR it is now possible to buy a five-pound box that keeps a person in such profound sleep, through electronic pulses applied to the temples, that only one or two hours sleep is required per day. Thousands of Russians are said to be using this device already, he stated.

Dr. Clarke believes that when people can "travel" all over the world via a screen and see anyone they wish instantly over satellite TV, actual travel will be reduced. This he sees as bad for the travel business but good for business in general.

The educational value of bringing information to the uneducated millions by picture and voice will be inestimable, but transmission of conflicting ideologies may also lead to new international problems with the result of jamming satellite communication from one country by another.

For better or for worse, communications satellites will be the nervous system of mankind, which will link the whole human race in a unity no earlier age could have imagined.

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POWER FOR TITAN II—The Chippewa spherical, solid propellant rocket engine is used in pairs on the Titan II missile. The 13-inch stainless steel engine, produced by the Thiokol Chemical Corporation, Trenton, N. J., uses a polyurethane propellant.

Man Not in Space

► THE PROBABILITY that man, as he is known on earth, exists anywhere else in the universe is so remote that it can be ruled out, an Italian biologist believes.

Dr. Rodolfo Margaria of the Milan University told the International Astronautical Congress in Washington, D. C., that the same geological, physical and chemical events that took place over three billion years on earth leading to life as now known would have to be duplicated exactly to create man elsewhere.

If the same elementary form of life did arise on another planet, the probability that it followed the same evolutionary path as man during the same time is so small as to be impossible to compute, he said.

Life in space, if it exists, will be far more different from man than is any other form of life surrounding man on earth, such as trees, Dr. Margaria predicts. Trees grow and have evolved under the same conditions as man and have also the same origin and ancestor as man.

Dr. Margaria believes it is unlikely man would find intelligent beings in the universe to communicate with. Such beings would have to be at least as intelligent as man as both sides would likely be handicapped by not having the same sensory organs. He pointed out how difficult it is for man to communicate with even the higher mammals which are so similar to man.

He noted that although it has been claimed that the chemical composition of the universe is fundamentally the same everywhere this claim refers to stars or solar systems as a whole.

For living forms to develop only the chemical condition of the surface of the planet is important and this is not supposed