

ASTRONOMY

Radio Signals From Planets

Surprising and unexpected results of radio astronomy research were among recent scientific events reported at the American Association for the Advancement of Science meeting.

RADIO "messages" from Venus, Jupiter and Mars have allowed exploration of these planets from the earth. Some results have been surprising.

A recently discovered radiation hazard to space vehicles entering and leaving the atmosphere of Jupiter will be roughly a hundred times greater than the hazard of the earth's radiation belts, discovered by satellites, Dr. Frank D. Drake of the National Radio Astronomy Observatory, Green Bank, W. Va., told the American Association for the Advancement of Science meeting in Chicago.

Jupiter is emitting continuously at least three billion watts in radio radiation at frequencies above about 100 megacycles per second. Dr. Drake suggested that this kind of radiation is caused by high energy electrons trapped in Jovian radiation belts similar to the terrestrial radiation belts that may worry future space travelers. The number of trapped particles in the belts around Jupiter may be a million times greater than in the terrestrial belts. The Jovian belts would require for their origin a magnetic field on Jupiter at least ten times stronger than on earth.

Giant antennae forming radio telescopes allow the observation of radio emissions of heavenly bodies. The great new national radio observatory in a sparsely populated West Virginia area is one of the principal receiving posts for this new kind of look at the planets and other heavenly objects.

Jupiter emits extremely strong 20 megacycle radiation that seems to be caused by great electrical storm disturbances in the Jovian atmosphere. This comes from only a few points on the planet and has been observed for about eight years, this year's being less than before, suggesting that solar activity controls this radiation to some extent.

The radio telescope has also observed the hard surface of Venus for the first time. It has a very high temperature, very nearly 585 degrees Fahrenheit, likely caused by the atmosphere acting like a greenhouse, the same effect that keeps the earth warm at night. The variation in surface temperature from day to night is extremely small on Venus.

Because the temperature is very much higher than the expected boiling point of water on Venus, no liquid water is believed to exist anywhere on Venus' surface. Because of absence of water in the liquid state, Dr. Drake believes life is very unlikely on Venus. What water there is on Venus is in the form of vapor in the atmosphere and the planetary surface probably consists of barren rocks and deserts.

Older ideas on Mars have not been changed by radio observations. The radio

emissions from space are, of course, not from artificial sources like our radio stations but are natural and more like static.

Even before explorers from earth arrive on the moon, there can be better lunar maps, D. W. G. Arthur, research associate of Yerkes Observatory, Williams Bay, Wis., told the astronomers.

Moon photographs contain a wealth of detail that has not been translated into maps, Dr. Arthur said, and the photographs have not been used correctly so that the major maps compiled in this century are only low-grade sketch maps. The best lunar map that could be made would still be inferior to a military topographic map compiled from very poor quality high-altitude aerial photography. The best moon photograph is equivalent to a naked-eye view from about 2,000 miles above the lunar surface and a telescopic observer at the best moments obtains an impression equivalent to a view from 600 miles.

Foreseeing the day when space navigators will require a map giving an overhead view



TEMPERATURE POWER—A ferroelectric converter, developed at the International Telephone and Telegraph Corporation Laboratories, may be useful to power satellites using heat sources only. Engineer Sigmund R. Hob holds a satellite mock-up: the dark sections of special ceramic coating providing the high-voltage alternating current. Outputs of approximately 1,000,000 volts—AC or DC—are theoretically possible, with outputs of more than 1,000 already achieved.

of each part of the moon's surface, Dr. Arthur outlined ways of achieving new maps that will be incomparably superior to those available today. Optical-mechanical plotting equipment especially designed for the job and based on principles parallel to those used in aerial photography would do the job.

Youth in Aged Men

AN APPROACH to a pharmaceutical fountain of youth has been achieved by administering androgenic steroid to aged men. A degree of restoration of youthful function, particularly of muscles, has been observed.

Dr. Gregory Pincus, research director of the Worcester Foundation for Experimental Biology, Shrewsbury, Mass., told the Association that the androgen administration alone does not completely restore youthful function in elderly men but it does help bring back some youthful attributes.

The use of the steroid for the treatment of the aged men is based upon the fact that with advancing age the manufacture in the body of steroids declines.

"There may be irreversible age condition changes that cannot be corrected by the steroid treatment and there may be other hormonal deficits," Dr. Pincus suggested.

"We still have no knowledge of age-related changes in the production of other steroidal hormones such as progesterone and aldosterone. Furthermore, the effects of the steroidal hormones upon other hormone producing systems in the body such as the thyroid gland and the pituitary gland yet remain to be explored in elderly subjects.

Dr. Pincus declared that the full role of the hormones as sustainers of youthful metabolic function still remains to be determined.

Family Life Changing

MARRIED COUPLES will have more than 15 years together after their youngest child has left home, a team of U. S. Bureau of the Census workers predicts for 1980.

Important changes in birth rates, age at marriage and other vital statistics are gradually being reflected in a changed family life, Dr. Paul C. Glick, Dr. David M. Heer and John C. Beresford reported to the American Association meeting.

The full force of the postwar "baby boom" will be felt beginning in about five years: the number of first marriages and the average annual increase in the number of households and families will rise substantially, they said.

Furthermore, relatively more women are having their children before the age of 40. From now into the near future, the researchers predict, the average married couple will have close to one-third of their married life remaining after the last child leaves home. Women will have increasingly more time during which to perform their roles as wife, joint breadwinner, society lady and community servant.

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