



MARS AND JUPITER

With a steady red light shines the planet named for the god of war. Below it and farther east is the brighter Jupiter.

When we look at Mars, for instance, the light that reaches us has passed through both the atmosphere of the earth and that of the planet. Some of the bands that appear in the spectrum of its light are therefore caused by our own atmosphere, and some by that of Mars.

The problem is to sort them out. This can be done by comparing the spectrum of the planet with that of the moon which is known, on entirely independent evidence, to be completely devoid of any layer of air.

At Same Height

In taking such spectra for comparison purposes, the planet and the moon must be at the same height in the sky, in order that the light of each will pass through the same thickness of terrestrial air. If the bands are then found to be stronger in the planetary spectrum than in that from the moon, it would indicate the presence of that particular gas in the planet's atmosphere. Forty years ago Dr. W. W. Campbell, of the Lick Observatory, used this method, and found no appreciable difference between the strength of the lines in the spectra of Venus and Mars, and that of the moon. This experiment indicated that the atmospheres of these planets certainly did not contain a quarter as much oxygen and water vapor as are in the earth's.

In recent years a more delicate method of sorting the two groups of bands has been used. This depends on the Doppler effect, the same thing that makes the pitch of a fire engine bell sound higher when approaching you than when going away. When the bell comes towards you the sound waves are

squeezed together, they enter the ear at small intervals and give the effect of a higher pitched sound. But when leaving, the waves are spread out, the pitch is lower.

Exactly the same effect is observed with light. When light reaches the earth from a star or planet that is approaching us, the light waves are squeezed together and the wavelength, corresponding to pitch, is reduced. This produces a shift of the lines in the spectrum towards the violet end. If the star is receding, the shift is towards the red.

If the speed with which the earth and Mars are separating, or coming together, were great enough, the two sets of bands would be entirely separated, and then it would be easy to distinguish one from the other. With less speed, the bands would merely be widened. At the Mt. Wilson Observatory in California, several astronomers have been working on this problem with the world's largest telescope and a very powerful spectroscope used with it.

No Oxygen

No oxygen has been detected in the light of Venus and Mars, though it is estimated that one thousandth as much as is on the earth would have produced a noticeable effect. The test for water vapor is not so delicate, but it is certain that there is very little on either planet.

In his address Dr. Russell pointed out, however, that certainly some water vapor must be present in the atmosphere of Mars, because observations of the heat show that every day at noon on the Martian equator the temperature rises above freezing, and even at the poles it reaches that point in midsum-

mer. Consequently, the white areas that we can see around the pole of Mars, which form during the winter and disappear in their summer, must be snow, and must evaporate when they disappear. They are probably very thin, perhaps not more than a few inches deep, and they would account for only a minute amount of water vapor, too small to be detected.

But the case for life on Mars is not entirely hopeless. There are green areas on Mars which appear and disappear with the coming of spring, summer and autumn, and these seem very likely to be vegetation. Vegetable life might well adapt itself to the conditions on the planet. Dr. Russell points out that a race with no more intelligence than our own could probably have worked out means of living on oxygen obtained electrically from water. Whether this has been done on Mars, however, is pure speculation, and the astronomer does not concern himself with a problem of this kind.

The moon is new on the third, at first quarter on the tenth, full on the eighteenth and at last quarter on the twenty-fifth, so that it will be seen during the evening from about the sixth to the twentieth. At 3:12 p. m., E. S. T., on the first, it will be at perigee, or closest to the earth, 224,400 miles away. On the thirteenth, at 7:48 p. m., it is farthest, at apogee, at a distance of 251,700 miles, but on the twenty-ninth, at 11:00 a. m., it is again at perigee with 227,550 miles separating us.

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PSYCHIATRY

Conscience, Immortality Disputed in England

THE English are having their own Battle of Dayton.

Instead, however, of fighting over whether man is descended from monkeys, the compatriots of evolutionist Darwin are waging a religious controversy over such matters as the voice of conscience, belief in the soul and hope of immortality.

Instead of being fought in a court of law as was the famous Tennessee battle, the English version of the Battle of Dayton is being fought in that truly English court of public opinion, the London Times.

The shot that started the London battle was fired by Dr. David Forsyth, president of the section of psychiatry of the Royal Society of Medicine, when he

declared in his presidential address that science and religion are "more incompatible than ever," when viewed from the standpoint of modern psychology.

Vehement protests from fellow physicians and religious leaders immediately followed.

Charges and counter-charges in the theological battle are reviewed for the benefit of American physicians by the London correspondent of the *Journal of the American Medical Association* (March 9).

Dr. Forsyth declared in his address that the mysterious business of gods and spirits is an example on a colossal scale of a hang-over of childish thinking. Religious thinking is "pleasure thinking, not reality thinking," in his terms. Christianity, he charges, is often cruel and sadistic: in other aspects it manifests a perverted enjoyment of being cruelly treated.

The "voice of conscience," according to this prominent psychologist, is merely the voice of the father remembered

from childhood. The sense of guilt, which begins to be felt around the age of seven, is always a conflict between the child's inclinations and the parents' wishes. Belief in a soul and the hope of immortality have simply been taken over by Christianity from primitive religions, and science has failed to discover a foundation for belief in the supernatural which Dr. Forsyth declares is the chief characteristic of religion.

Six medical psychologists and several other physicians have publicly disputed Dr. Forsyth. More largely than any other department of medicine, psychology rests on theory and speculation, they say. They deny his charges of sadism and masochism in Christianity—sexual perversions leading to cruelty and enjoyment of being cruelly treated.

The dean of St. Paul's, Dr. Mathews, also replied to Dr. Forsyth, admitting his argument that fantasy plays a part in some religious experience, but declaring that this is an aberration of religion.

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opinion that the sex gland product may in certain circumstances produce cancerous tissue.

Here is another new-found link: Breathing carbon monoxide in certain concentrations make mice sterile; in the same concentration, the gas slows the rate of growth of two kinds of cancer in mice.

What it all means and whether the links can be forged into armor strong enough to protect humanity against the dread foe, cancer, cannot yet be told, but these discoveries may well be the first links for such a coat of mail.

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ETHNOLOGY

"Wandering Gipsies" Becoming Stay-At-Homes

THE life of the wandering gipsy has been described by the story-writers as carefree, picturesque and highly attractive, although actual contact with a tribe quickly rubs off the glamour. It is only between the pages of a book or on the screen that a Lady Babbie is to be found.

Now science tells us that the gipsy tendency to wandering about the countryside, romantic or shiftless according to how you look at it, is not really the inherent characteristic of gipsies that fiction writers would have us believe. Three-fourths of the gipsies would not be gipsies if they had been trained to be anything else, although here, as in most cases, the training to be successful must start early.

This statement may be too optimistic but it is suggested by a study of the gipsy situation in Norway which has been reported by a Norwegian physician, Dr. E. Gisholt, who has been medical officer to one of the homes for children organized by the Gipsy Mis-

MEDICINE

Cancer Now Linked To Beginning of Life

CANCER brings to most minds a picture of suffering and death. Far different are the thoughts associated with the process that starts life, so that it is very strange to find the two processes—one so gloomy and the other so bright—linked together. But scientists are finding more and more links between them.

The latest discovery suggests that a product of the female sex glands may directly or indirectly produce in the body natural resistance to cancer. This does not mean that the gland product can be used as a remedy or preventive of cancer. The discovery of its possible role in prevention was made on animals and so far there is no human application. But the possibility of the gland product playing a part in building up resistance to cancer finds support from experience with human cases.

If this sex gland product or hormone is in some way responsible for natural resistance or immunity to cancer, one would expect the disease to occur most often when production of the sex hormone ceases, Dr. J. Argyle

Campbell of the National Institute for Medical Research, London, points out (*Nature*.) This is the case at any rate in women, since cancer is most prevalent in the age period after sexual activity has ceased.

The idea that the sex gland product is a factor in the development of natural immunity to cancer arose when Dr. J. B. Murphy of the Rockefeller Institute found that the embryonic skin of mice is equally with placental tissue the most powerful agent in making mice immune or resistant to tumors. It is possible that this skin which covers the mouse before birth manufactures "immune bodies"—substances which give the body power to resist disease—as the result of sex hormone and uterine activity, Dr. Campbell says.

Another interesting link between cancer and the reproductive process is the discovery of British scientists, Prof. E. C. Dodds and J. W. Cook, that this female sex gland product is chemically related to a cancer-producing substance derived from coal tar.

Other experiments have led to the

● RADIO

Tuesday, April 2, 4:30 p. m.

WHAT IS BELOW GROUND? by Dr. Charles Thom, Principal Mycologist of the Bureau of Plant Industry, U. S. Department of Agriculture.

Tuesday, April 9, 4:30 p. m.

THE MINOR PLANETS: STRAY SHEEP OF THE SOLAR SYSTEM, by Dr. A. O. Leuschner, Professor of Astronomy, University of California.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.