

it rises well south of the east point and sets well south of the west point. For us it is above the horizon much less than half of the twenty-four hours. Even at noon it does not rise very high. But in the summer, conditions are just the opposite. The sun rises in the northeast, sets in the northwest, is above the horizon for considerably more than half the day, and climbs to a great height at noon. Because it is in the sky so long, it has much more time to heat the earth. But even more important is the greater height. Its rays, on this account, fall on the ground almost vertically, and are thus more concentrated than when it is low.

*Science News Letter, June 26, 1937*

#### MEDICINE

### Medical Association Ends Birth Control Opposition

THE American Medical Association, after years of refusing officially to countenance birth control, adopted a committee report recommending investigation of methods and materials for contraception and the teaching of birth control procedure in medical schools.

All contraceptive advice, it was recommended, should be given at legally licensed clinics under medical control.

This seems to be in the nature of a triumph for the supporters of birth control movement. It means that physicians need no longer hesitate to give such advice to their patients when in their opinion bearing children would threaten the life or health of the mother or her children.

Only restriction on physicians now in this matter is such as may be imposed by the laws of their particular state.

*Science News Letter, June 26, 1937*

Insects living in dark cave recesses in Lehman Caves National Monument, Nevada, apparently are insensible to light but are highly sensitive to vibrations.

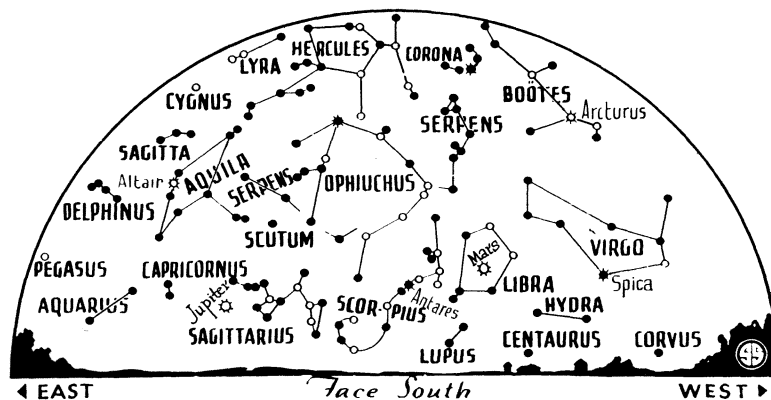
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#### RED PLANET, RED STAR

*Antares is not Mars' equal in brilliance and ruddy color.*

#### PHYSICS

## "Pencil and Paper" Team Set Pace For Cosmic Ray Research

THE mathematical genius of two University of California scientists is now guiding much of the cosmic ray research throughout the world. The "paper and pencil" team of Prof. J. F. Carlson and Prof. J. R. Oppenheimer has developed a new brain child in a theory of how the piercing cosmic rays are absorbed when they hit the upper atmosphere and eventually find their way into the recording instruments of the earth-bound investigators.

A majority of the cosmic ray researches reported at the recent meeting of the American Physical Society in Washington, for example, listed the work of Profs. Carlson and Oppenheimer as references.

The passage of a cosmic ray through the earth's atmosphere is like the return to earth of a 4th-of-July star-burst, according to the picture which physicists now have in mind. The path of the original ray branches out again and again into an ever-increasing number of new rays, called secondaries.

The task of Drs. Carlson and Oppenheimer was to calculate how often this branching-out takes place, how many times it can occur before the energy of the original ray (like the gunpowder in the 4th-of-July bomb) is all used up. Physicists want to know this in order that their observations near the earth's surface may tell them how many rays are coming into the atmosphere from outside.

The branching-out occurs when the cosmic ray particle comes very close to the nucleus of an atom in the air, according to the process which these physicists have calculated. In the intense electric field of the nucleus the cosmic ray particle (electron) generates a powerful kind of X-ray (photon) which in turn, when it comes close to another nucleus, is transformed back into a pair of electrons, charged positive and negative, respectively. The process repeats itself until the energy of the original ray is exhausted.

Another but less frequent kind of branching which Drs. Carlson and Oppenheimer mention in their paper involves the actual destruction of the atom with whose nucleus the cosmic ray collides. This results in a spray of atomic debris and is of the same nature as the transmutations which physicists accomplish with their high voltage atom-splitting machines and cyclotrons.

A current point of discussion among physicists is whether calculations like those made by the California physicists are valid for the tremendously high cosmic ray energies. The question might be, "Do the high-speed electrons from outer space obey the same laws as the electrons in radio tubes?" The tide seems to be turning in favor of the answer "Yes," according to recent reports.

*Science News Letter, June 26, 1937*