

## MARS MAY SUPPORT LIFE, NEW OBSERVATIONS SHOW

The climate on Mars is such that it may support life, mosses and lichens or trogdolytic animsla able to withstand a freezing night and a thawing midday on that ruddy planet. These are the conclusions presented to the American Physical Society by Dr. W. W. Coblentz of the U. S. Bureau of Standards, who with Dr. C. O. Lampland of the Lowell Observatory, Flagstaff, Ariz., has measured radiation from this planet and determined its temperatures accurately.

The north pole during the Martian winter has a temperature of 94 degrees below zero, Fahrenheit, and in summer the south pole is 76 degrees below zero. An estimated value for the night side of the planet is 112 degrees below zero Fahrenheit. In the equatorial regions of the planet, higher temperatures corresponding to those on earth are attained during the day, reaching 41 degrees Fahrenheit in the bright regions and 59 degrees Fahrenheit in the dark regions. The integrated temperature of the whole disk is 22 degrees below zero.

"What about life on Mars?" Dr. Coblentz said. "That depends upon our point of view; whether we think of palm trees growing in our tropics, or mosses and lichens which grow on the apparently bare piles of volcanic cinders of Arizona and under our arctic snows.

"The foregoing measurements show that for a few hours at noonday on the equator of Mars the surface temperature is not unlike that of Washington on some bright day in March. But consider the exceedingly cold nights and the great daily variation in temperature, amounting to perhaps 180 degrees Fahrenheit. Water is not present on Mars in sufficient quantity to form permanent lakes.

"Hence, with noonday temperatures of only 40 to 60 degrees Fahrenheit, even on the hottest spots on the equator, and with temperatures so low that probably all the water vapor freezes out of the atmosphere at night, it is evident that while vegetable and perhaps animal life appears to be possible on Mars it must be adapted to withstand prolonged drought and intense cold. Moreover, with such rapid temperature changes the reactions must be rapid. With most of the surface at arctic temperatures it is reasonable to assume that if vegetable life similar to ours can exist on Mars it must be like the mosses and lichens which thrive under our arctic snows. Similarly, animal life must be trogdolytic, able to burrow deep and hiberna or able to withstand the intense cold in a benumbed state, as do, for example, the torpid grasshoppers, wasps, and ants one find on warm days in winter.

"Apparently life on the equatorial regions of Mars is a process of thawing out and limbering up in the forenoon and a reversal of the process in the afternoon. On the other hand, in the polar regions where the Martian day is a matter of eight to twelve terrestrial months, judging from our measurements which are not yet completed, the temperature rise is not as high as on the equator. But during the long arctic day, temperatures will not be so extreme and living matter will not be subjected to such short periodic changes in activity as occur on the equator. From this it would appear that in the polar regions of Mars the cycle of development, reproduction and death of the living cell is not subjected to the hazards that appear to occur on the equator.

"For the first time in history physical measurements have been made which give an indication that the temperature of the surface of Mars rises above the freezing point of water. Prior to our measurements of 1922, and especially those of 1924, the general opinion prevailed that the temperature of Mars is far below freezing. On the basis of these new measurements speculation is already rife as to life on this planet."

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