

thirst in dogs. Under ordinary conditions a dog does almost all of his drinking within two or three hours after eating. During this time there is a marked reduction of the flow of saliva, corresponding roughly to that occurring if the animal does not get any water for 48 hours. But in four or five hours the secretion of saliva returns to normal,

even though the dog has had nothing to drink in the meantime.

Furthermore, if the animal is deprived of drink for five or six hours after feeding and then allowed to drink freely, his entire intake of water for the 24 hours is only about one half or one quarter of the amount he usually drinks during 24 hours.

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ASTROPHYSICS-METEOROLOGY

Climatic Cycles May Allow Long-Range Forecasting

Sunspots and Other Phenomena Show Regular Fluctuations Which May Have Practical Significance in Future

CLIMATE here on earth varies in cycles and there is hope that future generations may use the knowledge and records being accumulated by science to predict their weather and climatic environment for long periods in advance.

The National Academy of Sciences devoted one session to reports from the leading investigators of climatic cycles. While they presented evidence from sunspots, tree rings, clay layers, solar radiation and other phenomena showing regular fluctuations, they joined in placing the wide-spread practical application of these methods of prediction some years in the future.

The importance of knowing the regular fluctuation of climate was emphasized by Dr. John C. Merriam, president of the Carnegie Institution of Washington, chairman of the Academy's committee on the subject.

Weather Abnormalities Periodic

Summarizing forty years of study of the sun's radiation, Dr. C. G. Abbot, secretary of the Smithsonian Institution, reported that the sun's output of radiation is variable, that its variation is periodic, that the United States weather departures from normal are periodic, and that nearly all the ranges of weather departures from normal are comprised in a series of periodicities which are identical to those found in the sun.

"We have not yet tried the bold venture of long-range forecasting that might even enable meteorologists to forecast long in advance the fat years and the lean years as Joseph is said to have done in Egypt," Dr. Abbot ex-

plained. "We expect to discover by a little more research whether we have real cause and effect in these relationships."

The variations in solar radiation as measured daily from high mountain peaks in this country and South America can be reproduced by seven regular periodicities of 7, 8, 11, 21, 25, 45 and 68 months, Dr. Abbot's studies show.

Dr. Walter S. Adams, director of the Mount Wilson Observatory, upheld the reality of the sunspot cycle of about 11 years but declared the real cycle is from the time the spots are fewest until the sun is again free of spots. This is about 22 years long. The period of any one rise from minimum to maximum may vary from 9 to 14 years and the amplitude of the maxima may vary by 50 per cent. A longer period of 60 to 80 years also has been detected.

"It seems probable that both the quantity and quality of solar radiation vary during the sunspot cycle and many attempts have been made to correlate terrestrial phenomena with sunspots," said Dr. Adams, who has worked in collaboration with Dr. S. B. Nicholson. "Definite correlations have been found with the variations of terrestrial magnetism and its related phenomena. There is evidence of a slight correlation between sunspots and atmospheric temperature in certain regions on the earth and with other factors of weather and climate for limited regions and for limited time intervals. These correlations are so uncertain that, in the majority of cases at least, predictions based on them have very little weight."

Tree rings that record climate varia-

tions extending 3,000 years into the past were analyzed by Dr. A. E. Douglass of the University of Arizona. He explained how graphical analysis of the records had shown convincing evidence of the reality of climatic cycles, including one that corresponds to that of the sunspots.

Hope that the layers of clay sediments left by the receding glaciers of Ice Ages may be made to reveal the climates of those ages was expressed by Dr. Isaiah Bowman of the American Geographical Society. As yet these climatic indicators have not yet been tied into the present time or with the tree-ring records. Scientists are now attempting to link these natural records through study of the mud layers left in old lake bottoms in western United States and the trees that grew nearby.

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MEDICINE

Bad Cold May Nullify Liver Treatment in Anemia

WHY the effect of liver in treating pernicious anemia is checked by an acute infection, such as a bad cold or an acute attack of sinus trouble or any other infectious disease, was explained by Dr. Gulli Lindh Muller of the Thorndike Memorial Laboratory, Boston City Hospital and Harvard Medical School, who reported results of his studies to the American Association of Pathologists and Bacteriologists at Philadelphia.

The reason seems to be that acute infection has exactly the opposite effect on blood formation to that of liver or liver extract. The liver stimulates the blood-forming organs to produce new red blood cells. The infection seems to have a restraining effect on the blood-forming organs.

In the first series of patients treated with liver, Drs. Minot and Murphy, first to use the method, noticed that infection checked the response of the blood cells and the general improvement in the patient. Seeking an explanation for this, Dr. Muller studied pigeons, the only animals yet found to be peculiarly sensitive to liver.

Liver extract given to pigeons produces a condition of blood and bone marrow similar to that in pernicious anemia patients after treatment with liver, Dr. Muller explained. An acute infection will inhibit the response to liver treatment in these animals.

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