

Astronomer Forecasts English Rains

Meteorology

Storms which hampered the early days of the Boy Scouts' jamboree in England are but a forecast of a return to normal rainfall for the second half of 1929, after an exceedingly dry six months, according to predictions of Dr. Dinsmore Alter, professor of astronomy at the University of Kansas.

A test prediction by Dr. Alter, published in the U. S. Monthly Weather Review for June, 1927, forecast the dry season through which the British Isles have just passed. If the observed rainfall follows the prediction for the next six months as closely as it has in the past several years, England may look for approximately normal rainfall the rest of the year. After a damp spring in 1930, the prediction indicates, England may experience two years of sub-normal rainfall.

Dr. Alter has published a dozen papers on periodicity of rainfall, basing his studies on records from many sections of the world. The British Isles and the Pacific Coast of North America, with their purely marine

types of weather, and the purely continental types as found in the Punjab of India, and in Siberia, gave the most consistent results when mathematical formulae were applied.

The British Isles predictions, for example, were based on a study of data from six different places in the Isles, covering the years from 1834 to 1924. From these data, a periodogram was computed with a dozen or more peaks, the four principal of which were applied in producing the chart published in the United States two years ago, and making test predictions up to 1940.

Actual reports received since the test prediction was published have been charted, and found to have a high correlation. The predicted excess of rainfall by 12 per cent., in the spring of 1926, was found actually to be 18 per cent. excess of normal. The predicted excess of 3 per cent. in the fall of 1923 became an actual 4 per cent. deficiency, but the predicted excess rainfall for the latter part of 1927 and all of 1928 was even exceeded

by the actual figures. Reports received by Dr. Alter for the first three months of 1929 showed even less rainfall than the 22 per cent. he had predicted. The prediction is "practically normal" for the second half of this year.

Dr. Alter leaves for Europe the latter part of August to spend a year under a fellowship granted by the Guggenheim Foundation. He expects to spend the greater part of his time in England and Scotland, examining rainfall records, many of which are only in manuscript form, in a hope to discover further data that will make his predictions more accurate.

He disclaims all hope of being able to predict long in advance the weather probabilities for any particular day, but he does believe there are possibilities in predicting in larger units the possible weather, especially as to rainfall. Such predictions, if reasonably accurate, he believes, would be of great benefit to agriculture.

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Torricelli's Vacuum—Continued

Water E F: then the Mouth A was closed, that so only the *Water* in the space A G H might press upon the *Mercury*, which nevertheless lost none of the height lately gained by the weight of all the Incumbent *Water* E F, above the First Level I; yet in this case the included *Water* A G H, not by virtue of any Springs (which perchance it had not) but because it had been torced by the Charge of the whole height E F into the space left by the *Quick-silver* rising from I to O, and kept there by the same force, and so hindered from Returning. The same may be said to happen to the *Air*.

Lastly, Some desirous to see what Effect a greater, or lesser Rarefaction of the *Air* included in A G H would have, made this Trial.

Joyning to the Vessel A B the Beak C D (into which they fastned a Mouth of Metal with a *female Screw*), they adapted a *Syringe*; Then whenever a *Suction* was made of the *Air* in A G H, and so what remained attenuated and weakened, the Level I, might be seen to *subside*, contrarily when compressed more, by forcing in new *Air*; the same Level I was raised.

The same happens from *Fire* or *Ice* approaching it; for the Mouth C being closed, when *Fire* is Externally applied to the *Air* in A G H, the

Mercury rises, and by the application of *Ice subsides*; as if after the same manner, as it happened in the contrary operations of the *Syringe*; the *Air* had been Condensed, and enforced by Heat, and rarefied and weakened by Cold; from all which Matters it seemed probable, that this *sustention* of the *Fluid* does not absolutely depend upon the *weight* of the *Air*, but also upon the *compression* which lower parts of the *Air* receive from those above.

Evangelista Torricelli (1608-1647) was born at Faenza, Italy. At the age of 19 he was sent to Rome to study science. His work was chiefly in mathematics and mechanics. His development of the theory of some of Galileo's experiments led his teacher, Castelli, to send him to Galileo, and Torricelli served as amanuensis to the blind Galileo for the last three months of the older man's life. But Torricelli himself lived only six years longer. The famous experiment of creating a vacuum above the column of mercury supported by air pressure was first made in 1643.

The Academie del Cimento was a group of Italian scientists, pupils and followers of Galileo and of Torricelli, who banded together for the purpose of making experiments supplementary to those of their masters. They rigidly excluded philosophical interpretation and explanation, and sought only experimental truth. They published their researches only in the name of their society.

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Breathe Exhaust Fumes

Physiology

The U. S. Bureau of Mines, in cooperation with the bridge and tunnel commissions of New Jersey and New York, has recently conducted an experiment to discover whether persons exposed for long periods of time to the exhaust fumes in the Holland Vehicular Tunnel would become ill.

Six men volunteered to breathe the fumes for from four to seven hours each day over a period of 68 days. The gas mixture used in the experiment contained 2, 3, and 4 parts of carbon monoxide to 10,000 parts of air. Some of the men had frontal headaches after breathing the mildest mixture for 3½ hours and after an exposure of only 1½ hours to the strongest mixture. After four hours of exposure to the 4-part mixture the blood had absorbed the gas to an extent of 30 per cent. No serious effects were noted in the short time that it would take to drive through the tunnel.

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Umbrellas are considered signs of dignity and authority among natives of the Gold Coast in West Africa.

Chinese tung oil, which has many uses, is now the fourth largest chemical import of the United States.