tation cycles but of tree-growth, clay-varve, auroral and earth-quake cycles. Tree-rings and annual clay-varves have been used to establish the existence of many long cycles.

By means of such cycles the clay-varves of De Geer and Antevs have been chronologically tied to the tree-rings of Douglass, thus furnishing a recording "rain-gage" that runs back without a break to 16,460 B.C. which was the "peak" of the last Ice Age.

Accurate long-range weather forecasting is in sight, but much research remains to be done before that can be accomplished. The most fruitful fields of research are tree-rings and varves in many regions, cyclograms of which will establish the amplitudes of precipitation curves and regional characteristics of these curves. Then by combining the ordinates of all cycle curves, a resultant curve will be produced for each region that will fit the actual curve. When this is accomplished satisfactory forecasting of precipitation many years ahead will begin.—Excerpts from author's abstract.

Discussion: Colonel HERSHEY said he found Mr. GILLETTE's paper so interesting that even if he did not believe it he would like to hear it often. Meteorology is a young science in comparison with astronomy and there are many things yet to discover.

Dr. MCEWEN expressed the idea that since there was so much difficulty in accounting for results by thermal causes it seems likely there must be some important outside extraterrestrial factors, probably magnetic or electrical effects. He suggested a more thorough study of the so-called "natural rain gages" or varves and other methods to project rainfall records back into ancient times.

Mr. HAYS asked how many short cycles had been accounted for. Mr. GILLETTE replied there were numerous short cycles, such as the 70-day sunspot cycle with its subcycle of one-twelfth, the moon's sidereal cycle; solar cycle; etc.

Major BOWIE spoke of the many men who had attempted to correlate planetary influences and weather and of the need for more investigation. (To be continued in December BULLETIN)

THE EAST WIND AT BOSTON1

By G. A. LOVELAND, U. S. Weather Bureau

Dr. Loveland said that the east wind with its raw, chilly and disagreeable aspects, and regarded as retarding the advance of spring and delaying the cold weather in winter, in fact actually blows only a small percentage of the time. During 24 years, he said, it actually blew only four per cent of the time. He said its effects on the climate of Boston are in the main beneficial.—Abstr. from U. S. Daily.

Discussion: As a factor in the frequency of the east wind in May Dr. Brooks cited Bigelow on the inflow of cold water into the Gulf of Maine at this time of year following the break-up of ice in the St.

1 Washington meeting, May 4, 1931. See more extended notes in May BULLETIN.
Lawrence estuary. Mr. H. A. Jones mentioned dry east winds in Mississippi which dried up crops. Even in West Virginia he had known of east wind damage by drying that exceeded frost damage. He asked for the cause of the dryness of such east winds, and the Chairman, Prof. Marvin, called for an answer. Dr. Brooks responded with the suggestion that the dryness was due both to the polar source of the air and to its descent in the anticyclones that cause these winds.

WEATHER CONDITIONS AFFECTING PORT OF NEW ORLEANS¹

By W. F. McDonald, U. S. Weather Bureau

Climatic conditions bearing upon the commerce of the port of New Orleans are more favorable than otherwise, with the sole exception of the hazard of severe tropical storms, which is infrequent, having occurred only twice in the last forty years.—Author's summary.

Discussion: The high humidity was stressed as a factor in the commerce, and the statement was made that the increase in weight of purchases in Colorado where the humidity is low due to moisture absorbed en route to New Orleans was enough to pay the freight. Cotton absorbs some 20 lbs. to the bale. Mr. Patterson mentioned a climatological port survey of Canada which is being made.

VISIBILITY METER ²

By John Patterson, M.A., Meteorological Office, Toronto

A visibility meter has been devised for determining the distance from which airport boundary lights (100 watt) can be seen at night. A flashlight bulb light reduced to a standard of $10^{-6.7}$ meter candles, calibrated by a star, is reflected into the line of sight of the airport light, and the airport light is reduced by a neutral wedge to equality with the standard light. The wedge is calibrated and the distance the boundary light can be seen is then obtained from the scale reading.

Discussion: Dr. Littlehailes asked if the paper were to be published, and Mr. Patterson said it was in press now. Dr. Humphreys remarked that uniformity of obstructing material would have to be assumed, and Mr. Patterson said he considered the wedge as meeting this requirement. The extinction method of determining visibility is not so good as the comparison method, for eyes differ both as to vision and as to accommodation to the dark. He considered a wedge better than a number of glasses of equal thickness. Mr. Gregg remarked there were local differences in visibility and that it is well to observe distant lights as well as near-by ones. Mr. Johnson asked what method was used to reduce the intensity of the pilot light, and Mr. Patterson replied that screens were used for this purpose, and said the intensity was kept constant by controlling the current through the lamp.

² Washington meeting, May 4, 1931.