

Seven different causes might be assigned, namely, progression of the isobars, wind denivellation, rapid flooding, partial rainfall, squalls, impact of wind gusts, and periodic minor fluctuations of the atmospheric pressure. Lantern-slides were shown giving simultaneous microbarograms, anemograms, and limnograms taken on Loch Earn, and from these it appeared that the most frequent causes of seiches were squalls and periodic minor fluctuations of atmospheric pressure. The well-known embroderies which appear on limnograms during windy or unsettled weather were found to be due, in many cases, to solitary waves or groups of waves which are raised by small squalls. In some cases these wave-groups travel faster than the squall which produces them, so that the lake vibration at certain places precedes the wind disturbance which has caused it but is following after it. A particularly good instance was observed of an atmospheric-pressure fluctuation which was steadily periodic for several complete periods, and which was immediately responded to by a seiche of marked periodicity. An account of the mathematical theory was reserved for the next meeting.—Notes on hydrodynamics, chiefly on vortex motion: Prof. Andrew Gray. These depended upon a novel transformation of the usual hydrodynamical equations, leading to specially neat forms of solution of certain types of problem.

December 7.—Dr. Horne, F.R.S., vice-president, in the chair.—A monograph on the general morphology of the myxinoïd fishes, based on a study of Myxine, part iii.: Prof. F. J. Cole. The chief interest of this continuation of previous papers on the same subject lay in the illustrations, which had been carefully and elaborately drawn.—An investigation of the seiches of Loch Earn by the Scottish Lake Survey, parts iii.-v.: Prof. Chrystal. The memoir concluded with a mathematical appendix on the effect of pressure disturbances upon the seiches in a uniform parabolic lake. Rayleigh's method of normal coordinates was made use of with great advantage. The first problem solved was the effect of a uniform excess of pressure over a part of a lake, the excess being assumed to last for a definite time, usually the half-period of one of the seiches, the uninodal, binodal, or trinodal, as the case might be. The amplitudes of the seiches generated were calculated, and found to be of the same order of quantity as the pressure disturbance when estimated in terms of the water barometer. The disturbance caused by a suddenly generated distribution of pressure, expressible in a series of zonal harmonics, was then found, and this led, by use of the principle of superposition, to the calculation of the effect of a pressure disturbance varying both in space and time. The special case of a sudden rise of pressure, propagated with uniform velocity from one end of the lake to the other, was worked out in detail for a lake of parabolic bottom contour six miles long and 270 feet in depth. It was proved that the uninodal seiche was most affected when the disturbance was propagated with a speed of thirty-seven miles per hour.

#### MANCHESTER.

**Literary and Philosophical Society, December 1.**—Prof. H. B. Dixon, F.R.S., president, in the chair.—The dawn of human intention: an experimental and comparative study of eoliths: Prof. A. Schwartz and Sir Hugh R. Beevor. The term "eolith" was first used to designate certain flint chippings found by Mr. Benjamin Harrison in the chalk plateau in Kent, which bore traces that led him to suggest that they were really primitive tools of early man. This view, though receiving the support of De Barri Crawshaw and Prestwich, was not generally accepted, and evoked much controversy. The authors now sought to show that the existence of eoliths as the work of man was a fact which was capable of demonstration. They found from anatomical and mechanical considerations that the fundamental processes in which primitive man would need the aid of tools were:—(1) striking; (2) cutting; (3) scraping; (4) piercing; and (5) the production of fire. Then, selecting suitable fragments of flint, they performed with them the simple operations involved in these processes, carefully noting the effects of such use, and of the secondary work of re-sharpening, on the flints themselves. In this way they

were able to establish certain definite characters for each hypothetical class of tools. A comparison of eoliths, collected in considerable numbers from different sources, with the artificially produced tools showed a very close agreement in respect of their characters.

### DIARY OF SOCIETIES.

THURSDAY, DECEMBER 17.

LINNEAN SOCIETY, at 8.—The Anomura (of the Red Sea): W. Riddell.—Forms of Flowers in *Valeriana dioica*: R. P. Gregory.—Études sur les Cirrhépèdes du Cambridge Museum: Prof. A. Gruvel.—Rhynchota from the *Sealarik* Expedition: W. L. Distant.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Electric Discharge and the Production of Nitric Acid: W. Cramp and B. Hoyle.

INSTITUTION OF MINING AND METALLURGY, at 8.—A Visit to the Mineral Districts of Canada: W. Frecheville and H. F. Marriott.—Notes on Plant in the Mining Districts of Canada: R. E. Commans.

FRIDAY, DECEMBER 18.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Type-casting and Composing Machinery: L. A. Legros.

INSTITUTION OF CIVIL ENGINEERS, at 8.—High-power Water-turbines on Moderate Falls: R. Wolfenden.

MONDAY, DECEMBER 21.

FARADAY SOCIETY, at 8.—The Influence of Cheap Electricity on Electrolytic and Electrothermal Industries: E. A. Ashcroft.

TUESDAY, DECEMBER 22.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Investigation of the Heat-losses in an Electric Power-station: F. H. Corson.

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