theoretical and practical results in terms of fundamental space array of molecules or aggregates acting as units, polymerisation, the swelling of gels, and changes during aging. X-ray science has apparently reached the stage wherein it may analyse all matter in any form whatsoever.

GEORGE L. CLARK.
Dept. of Chemical Engineering,
Mass. Institute of Technology,
Cambridge, Massachusetts, U.S.A.

Potentials during the Solar Eclipse.

OWING to adverse weather conditions we were unable to take any photographs of the solar eclipse at Bangor. Certain other observations which were made may be of interest. A thermometer mounted on a stand in the open and viewed through a telescope recorded a drop in temperature of only 0°·5 C., the actual temperature at the time of totality being 8°·5 C.

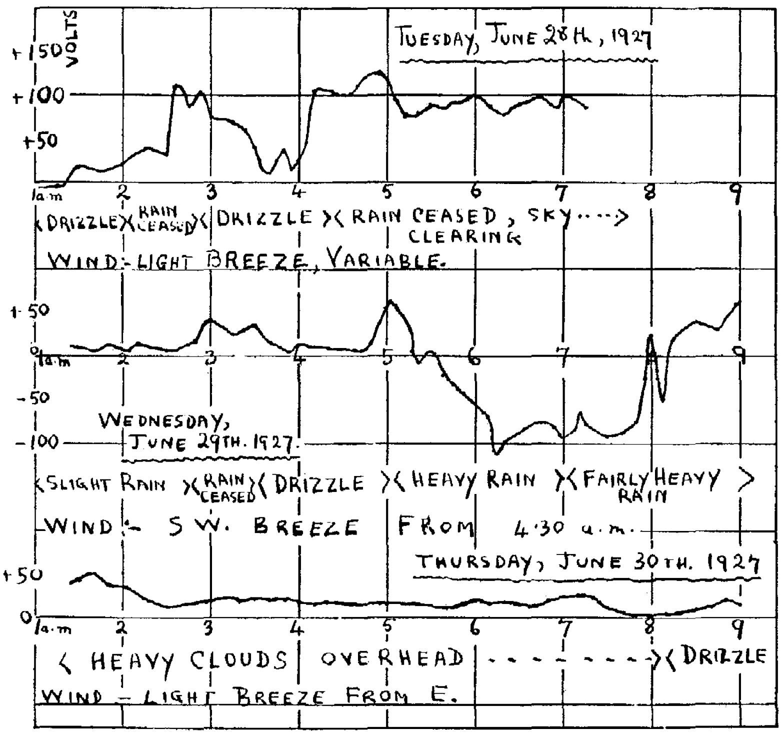

FIG. 1.

Readings were taken by the water-drop method of the variation of the potential at a point 215 cm. above the ground before, during, and after the eclipse. The potentials recorded on June 28, 29, and 30 are shown in the accompanying diagram (Fig. 1). It will be noticed that during the eclipse there was a change from a positive to a negative potential, this change being probably due to the heavy rain which fell at the time.

The darkness and fall of temperature during totality were not so marked as they would have been had there been no cloud, and the whole phenomenon was disappointing in this part of the country.

E. A. OWEN.
H. I. JONES.
Physics Department,
University College of North Wales,
Bangor.

Series in the First Spark Spectrum of Tin.

FOLLOWING the work of one of the authors on regularities in the spark spectrum of tin (Sn III, *Proc. Phy. Soc.*, **39**, 161; 1927; and Sn IV, in the course of publication), the spectrum of the element in the singly-ionised stage (Sn II) has been investigated.

According to the theory of spectra recently developed by Hund, the first spark spectrum of tin must arise from transitions of one electron successively through the O_2, P_1, O_3, P_2, Q_1, O_4 . . . shells which result respectively in the usual doublet terms in the order of value, 1^2P, 1^2S, 1^2D, 2^2P, 2^2S, 1^2F, etc. All these terms have been found, the largest being $1^2P_1 = 117684$, giving the second ionisation potential of tin to be about 14·5 volts. Besides these, the configuration of one O_1 and two O_2 electrons gives $^4\bar{P}$, a^2D, $^2\bar{P}$, a^2S terms. Combination pairs between this a^2D term (found to be identical with the x_{12} terms mentioned in the paper referred to above) and the regular ^2P and ^2F terms are detected, the latter forming a characteristic series, very prominently seen in the spark spectrum of the element, and there is probably an indication of the existence of the $^4\bar{P}$ term also. As a result of the analysis, about thirty lines of the first spark spectrum of the element have been classified, which include a large number of the strong lines observed in the ordinary spark and the vacuum arc in the visible and the fluorite region.

The first doublet P separation is found to be 4247 cm.$^{-1}$ which is in agreement with the value inferred from the probable limiting difference $\infty^3\bar{P}_1 - \infty^3\bar{P}_2$ of the arc spectrum of tin. The second separation $2^2P_1 - 2^2P_2 = 886·2$ and the second principal pair $1^2S - 2^2P_{12}$, with the aid of the relativity doublet laws, have led to the two following pairs in the spectrum of Sb III (which is under investigation by us). These pairs probably form the consecutive members of the second sharp series of the spectrum.

λ.	Int.	ν.	Δν.
4591·89	(5)	21771·5	1668·1
4265·089	(6)	23439·6	
4693·09	(5)	21302·0	1668·2
4352·25	(6)	22970·2	

In general features the first spark spectrum of tin is found to resemble closely the spectrum of Si II, analysed by Fowler. Details of the analysis will be published shortly.

A. L. NARAYAN.
K. R. RAO.
Vizianagram,
May 29.