solutions could be increased in such a manner that in laboratory tests the first stage of the reaction of zymase, for example, on glucose, produces 4, 5, and more c.c. of carbon dioxide per minute, so that a cell-free zymase solution can easily be prepared which will produce (using 20 c.c. of the zymase preparation containing 5 per cent. of the substrat) 100 c.c. or more of carbon dioxide in less than one hour. Similar effect of increased production of oxygen was obtained by the decomposition of hydrogen peroxide by means of catalase from fresh tobacco leaves.

The reactivity of the surface of the enzymes concerned in this reaction may be tremendously increased by appropriate peptisation, and the velocity of the reaction later undergoes a decrease which cannot be due yet to the decreasing concentration of the reactant. Further experiments have shown that this capacity to react in an intensive manner can be maintained, within certain ranges, in both cases by working with living cells or with the colloidal cell-free solutions. The experiments carried out indicate that certain chemical compounds are capable of forming an adsorption film on the surface of the enzymes which has the rôle of a *protector* (F. F. Nord, *Protoplasma*, **2**, No. 2; 1927). It might thus be assumed further that certain compounds which are supposed to have the effect of an 'activator' of an enzymatic reaction are in reality not activating the reaction, but only insufficiently protecting the enzyme from the damaging effect of intermediate or final metabolic products of the reactions concerned. It might be regarded, therefore, as correct to assume that regardless of the absence or the presence of a protector, which might even be a specific protector, there is always a certain concentration of enzymes present which is potentially capable of acting. However, since the reactivity of the enzyme is dependent on its surface activity, it undergoes immediately with the initial reaction alterations which decrease relatively the velocity of the reaction independently of the concentration of the reactant. In the course of the reaction the ratio between active and 'damaged' enzyme may decrease more and more below 1. Our present experiments have shown that it is possible to delay the speed of the reaction reflected in the change of the quotient noted above.

Since the most favourable conditions for the performance of an enzymatic reaction are in most cases not known, the statements above suggest the conclusion that in a great number of so-called 'activations' of enzymatic reactions by means of chemical compounds, in fact no 'activation' takes place by influencing enzymatic reaction through these compounds, *but the so-called 'activators,' which appear to be really protectors, enable the enzymes to act under conditions which are more nearly those which might be expected to be prevalent in ideal cases.*

The experimental work has been carried out in collaboration with Kurt W. Franke. The details will be prepared for publication in the near future.

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April 12.

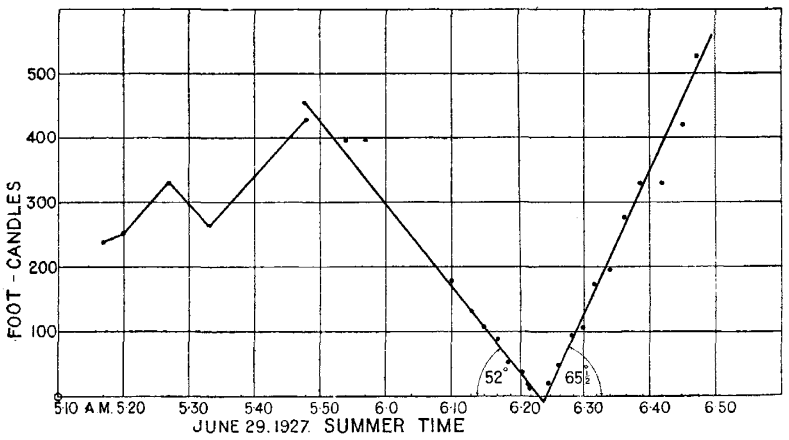

FIG. 1.

Photometric Measurements during the Total Solar Eclipse.

IT occurred to me that it would be interesting to measure the illumination received by a horizontal surface exposed to the hemisphere of sky during the whole period of the eclipse.

I had the good fortune to see the eclipse from a large flat field to the south-east of Bankfield Lane, Southport. There were some distant low houses to the north-west, and some distant trees to the west-south-west, but for the purpose in question it may be assumed that the white test surface, placed six inches above the ground, was exposed to the hemisphere of sky, except for the obstruction of light caused by my crouched body. This was allowed for before the results were plotted (Fig. 1). The readings were taken by means of a daylight photometer (a lumeter).

Practically the whole of the sun's disc was visible for the whole of the time, but there was a haze all the time. Sometimes this haze was noticeably thicker, but fortunately this variation occurred towards the beginning and end of the readings. The regularity of the readings from 5.48 A.M. (with the exception of 5.57 A.M. when the haze was noted) to 6.47·5 A.M. seems to show that the haze must have remained constant during that period. My position when reading was north-east of the test surface, so that the direct sunlight was screened from the surface.

It will be seen that the two inclined lines intersect at 6.24 A.M. (mid-totality), and that the line of decreasing illumination makes an angle of 52° with the horizontal, while in the case of the line of increasing illumination the angle is 65·5° This is due to the greater elevation of the sun during the latter period.

Several accounts of the eclipse refer to the " sudden switching off of the light at totality." This does not seem to be borne out by the curve. It was also thought by many that the light after totality was much greater than before. The curve does support this impression to some extent, but probably most of it was due to the physiological effect of the eye (pupil and retina) adjusting itself gradually to the decreasing light and then suddenly receiving the bright light after totality.

For the convenience of readers when studying the curve, it may be mentioned that at Southport on June 29, the sun rose at 4.47 A.M. Summer Time, first contact occurred at 5.30 A.M. Summer Time, and last contact at 7.21 A.M. Summer Time.

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