

lytic ferment which will convert fibrin into peptone and then into leucin and tyrosin.

2. This exists in the resting seed in the form a zymogen, which is easily convertible into the ferment.

3. The ferment acts best in a slightly acid medium; its activity is hindered by neutral salts and destroyed by alkalis, and it is most active at a temperature of 40° C.

4. The process of germination is started or accompanied by a transformation of the zymogen into ferment on the absorption of water and the development of vegetable acids in the cells of the seed.

5. The ferment so developed converts the proteids of the resting seed into acid albumin or parapeptone, peptone, and crystalline amides.

6. The nitrogen travels from the cells of the seed to the growing points in the form of the latter bodies and not in that of peptone or other proteid.

VII. "Preliminary Account of the Observations of the Eclipse of the Sun at Grenada in August, 1886." By Captain DARWIN, R.E. Communicated by LORD RAYLEIGH, Sec. R.S. Received November 25, 1886.

The instruments allotted to me consisted of the coronagraph and the prismatic camera; the two instruments being mounted on the same equatorial stand.

The prismatic camera is the same instrument which was used at the eclipses of 1882 and 1884. It consists of an ordinary photographic camera with a 60° prism placed in front of the lens.

The coronagraph consists of a reflecting telescope arranged for obtaining photographic records, and in which special precautions are taken to avoid internally reflected light.

This instrument was designed by Dr. Huggins, with the idea that it might be possible to obtain photographs of the corona in sunlight, that is at other times than at eclipses, and I was especially directed to test the practicability of this method. The test could be applied in two ways:—

1st. By obtaining photographs shortly before or after the eclipse, and comparing any irregularity that might appear in the halo round the sun with any photographs of the corona taken during totality; a similarity of form indicating that the corona had been photographed.

2nd. To take photographs during partial eclipse. Then if the light of the corona produces any effect on the plate, the limb of the moon should be visible against it.

On the day before the eclipse I took a considerable number of photographs for the first test. No similarity has yet been traced between the form of the corona as obtained on these plates, and the form of the true corona as obtained during the total eclipse.

During totality I had intended to carry out the following programme :—During the first minute a photograph was to be taken with the prismatic camera. After that four plates were to be exposed with the coronagraph with the same length of exposure as that given during sunlight. The exposure was given automatically by means of a shutter, with an estimated length of between one-tenth and one-fifth of a second. Besides these, two photographs were to be taken with exposures of five and ten seconds respectively.

The programme could not be carried out exactly. Immediately after I had commenced exposing the prismatic camera, I looked up, and found that the corona was covered by a light cloud. The sky became clear again in about fifty seconds. I was anxious not to take any other photographs at the same time for fear of vibration ; but as nearly a minute had been lost something had to be sacrificed, and I decided to take some of the photographs with the coronagraph before putting the cap on the prismatic camera. I do not think that the work has suffered in consequence, and at all events I obtained all the plates I had intended to. As to the results, I am not yet in a position to fully report on them.

The photograph obtained with the prismatic camera shows several images of the prominences, and it therefore gives every promise of yielding good results when measured and examined.

The five and ten second photographs of the corona show signs of a slight vibration, but they will be useful for the inner part of the corona. As my main object was to obtain instantaneous photographs, these long exposure plates had to be obtained by working the automatic shutter by hand ; it was this probably that caused the vibration.

The instantaneous photographs of the corona when developed were complete blanks, proving that the exposure was too short. It should, however, be observed that this does not prove that the light of the corona was insufficient to cause an appreciable effect on the plate if combined with other light. More light energy is necessary to start photographic action than is required to produce a visible difference of shade when once the action is started.

Many of the photographs taken during partial eclipse show what may be described as a false corona, that is, an increase of density near the sun and between the cusps, or *in front of* the moon. In none of them can the moon be seen eclipsing the corona.

The results, therefore, are adverse to the possibility of obtaining photographs of the corona in sunlight ; it is, however, I consider by no means proved that the method is impossible. But at present I am

inclined to consider that the result tends to show that a *practical* method of obtaining photographic records of the corona during sunlight is not likely to be obtained. The trial was not conclusive because the conditions were very unfavourable. In order to reduce the air-glare to a minimum, so that the light of the corona shall not be overpowered, the following points must be observed :—

1st. The air should be clear and dry.

2nd. The sun should be near the zenith.

3rd. The station should be at a considerable elevation above the sea.

4th. The corona, if it does vary in intensity, should be at its maximum brightness.

Now every one of these conditions was unfavourable. The air was saturated with moisture, the sky was of a hazy blue, the sun was low, the station was near the sea-level, and the corona according to the general impression was not so bright as on other occasions.

I hope, however, to deal more fully with the considerations on another occasion.

The Society adjourned over the Christmas Recess to Thursday, January 6th, 1887.

*Presents, December 9, 1886.*

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