

beauty of calla-lilies, heaths, poppies, and ferns; the likeness between frost-flowers on the window-pane and the snow-laden forest-trees; the flower-like corals; the individuality of shells; the exquisiteness of hidden organic architecture; the conscious beauty of Argus pheasant and bird of paradise; and much more besides. Who is sufficient for all these things? The pages are too crowded to do full justice to the various pictures, the table of the beauty-feast is overloaded, but no one can fail to get an impression of subtle and exuberant beauty. The text accompanying the album consists of two essays. The first is by Haeckel, entitled, "Nature as Artist," and in it the veteran expounds his theory of a "plastic instinct" in protoplasm. Every organic product arises in accordance with physical and chemical laws, but it is none the less an expression of the "cell-soul." Many naturalists have said the same thing in different words! The second essay is by Dr. W. Breitenbach and deals with the universality of beauty in nature, its manifold expression, and the enrichment of human life which it may afford.

(9) We have nothing but praise for the Regional Survey which has been compiled and published by the Bournemouth Natural Science Society under the able editorship of Sir Daniel Morris. It is a model of what such a book should be—dealing with the topography, geology, zoology, and botany of the district, and not forgetting the works of man, both past and present. The society is to be congratulated on having so many members able to co-operate competently in a work of this kind; and those who have the good fortune to reside in an area with so many interesting features are to be congratulated on the possession of this excellent aid to a fuller appreciation of their opportunities.

(10) Prof. Bastian Schmid has done a useful piece of work in compiling a manual on the technique of natural science, and he deserves our thanks. The book had, of course, to be written co-operatively, for only experts could deal effectively with the great variety of technical methods now in use in nature study in the wide sense. Prof. H. Poll deals with zoological microscopy, Dr. H. Fischer with botanical microscopy, including bacteriological and mycological methods, Prof. P. Claussen with experiments in vegetable physiology, Prof. R. Rosemann with methods in animal physiology, Dr. C. Wagler with hydrobiology, Dr. O. Steche with collecting and preserving insects, Dr. Paul Kammerer with collecting molluses and vertebrates, Prof. Schoeler with herbaria, Prof. B. Wandolleck with preserving animals and setting them up, Prof. F. Urban with vivaria, Dr. P. Esser with school-gardens, Dr. H. Fischer with the microscope, Prof. B. Wandolleck with photography, Prof. R. Fricke with excursions, the editor with practical arrangements and devices in schools and colleges, Dr. A. Berg with geological school-collections, and Prof. Bock with the care and appreciation of what is beautiful and instructive in open nature. The result of this collaboration is a very remarkable

and valuable book which ought to be utilised by those teachers of natural science who wish to make their instruction more effective. Where we have been able to test the work, we have found it to be altogether to the point—detailed, precise, and up to date.

(11) Drs. B. Schmid and C. Thesing have made a brave attempt to combine a Who's Who in Biology, a directory of institutes, gardens, and technicians, an obituary, a list of the most important recent biological publications, and a number of short essays dealing with present-day problems. It is the first issue, and we sympathise with the editorial appeal for suggestions rather than criticisms. We would suggest that the editors should re-cast their net. A list of contemporary biologists which omits Bateson, Delage, Wilson (to take an instance from each of three countries), obviously requires revision, and the same remark applies to the pages devoted to the almost impossible task of giving a list of the most important publications. The bibliographies of the works of not a few of the biologists are much in need of pruning: others, such as Sir Ray Lankester's, are as much in need of being brought nearer completeness. The introductory essays on bird-marking, symbiosis, phenology, natural science in schools, problems of modern zoology, microscopic technique, and the like are admirable. As the calendar makes for co-ordination, we wish it success.

THE TOTAL SOLAR ECLIPSE OF AUGUST 21, 1914.

(1) THE ROYAL OBSERVATORY ECLIPSE EXPEDITION TO MINSK, RUSSIA.

THE programme of observations of the Royal Observatory Eclipse Expedition to Minsk, Russia, was in the main the same as that planned for the Brazilian eclipse in 1912, but which rain had prevented from being carried out. The instruments comprised: (1) the Thompson coronagraph, consisting of a lens of 9 in. aperture and of 8 ft. 6 in. focal length, in conjunction with a Dallmeyer negative enlarger, giving an equivalent focal length of 36 ft., for the purpose of taking large-scale photographs of the corona, on a scale of 4 in. to the sun's diameter. (2) Two telescopes of 6 in. aperture, and of focal lengths 2 ft. 3 in., and 6 ft. 6 in. respectively, used in conjunction with green colour filters (Wratten and Wainwright's mercury monochromat), which let through a band in the green in the region of the coronium line λ 5303, the object of these being to obtain evidence as to the presence and distribution of coronium in the corona. In order to disperse such continuous light from the corona as the filter transmitted, a prism was placed before each object glass. (3) The Hills' quartz spectrograph for obtaining the ultra-violet spectrum of the flash and of the corona. For (1) and (2) 16 in. celostats were used, and for (3) a celostat with a 9-in. speculum mirror, in combination with a speculum condensing mirror. Provision was also made for obtaining iron arc

and solar comparison spectra, for the accurate determination of the wave-lengths.

The expedition was fortunate in having an

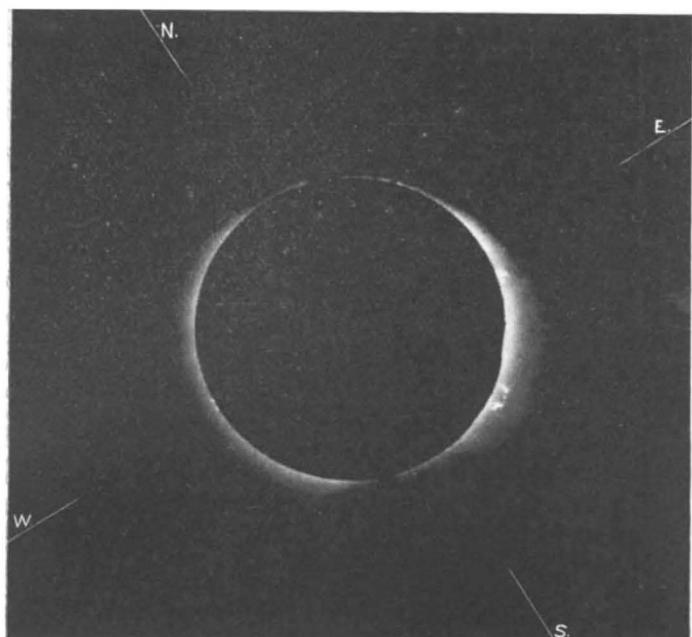


FIG. 1.—Corona, 2-4 sec., Ilford Process Plate.

unobscured view of the eclipse during the whole period of totality, there being much cloud in the sky at the time, and the returning crescent being hidden immediately afterwards. In the town of Minsk, three miles away, practically nothing was seen of totality. Thus the whole programme of observations was carried through.

To the eye, the corona appeared bright and of a steely-blue whiteness, and during totality the darkness was not very intense. Regulus could be seen shining through the corona, and Mercury and Venus were also visible. The corona was of the intermediate type, with four streamers, and resembling somewhat the 1898 corona. A sheet was spread for the observation of shadow bands, but none were observed. The temperature readings taken during the eclipse show that the shade temperature fell 5°F ., but the humidity was not affected.

With the coronagraph seven photographs were taken, with exposures varying from 2 to 25 secs., on Ilford Process, Empress, and Special Rapid plates. These show a large prominence on the limb of the sun near the point of second contact, about one-twentieth of the sun's diameter in height. In the neighbourhood of this prominence the corona shows some interesting detail in the form of coronal arches. There was also a smaller prominence on the other limb of the sun. The shape and structure of the present corona is interesting as compared with the records of past coronas, inasmuch as it is of a type which has not been previously studied, viz., that belonging to

the sun when near minimum, but with an increasing spot-activity. Fig. 1 shows the corona, near the commencement of totality, photographed on a

Process plate with an exposure of 2 seconds, and developed with pyro-soda. Fig. 2 shows it near the end of totality, the exposure being 5 seconds on an Empress plate, developed with methol-quinol.

With each of the telescopes with the colour filters four exposures were made, of 25, 40, 40, and 25 secs. respectively, the refracting edges of the prisms being vertical for the first two and horizontal for the second two exposures. For the purpose of changing from one position to the other, the telescopes had been mounted so that their axes could move upon the surface of a right circular cone the axis of which was in the direction of the beam reflected from the coelostat. The presence of coronium in the corona should be indicated on the photographs by a sharp ring superposed upon a fainter background due to the dispersed continuous light. The photographs taken enable us to assert that any results obtained without the use of prisms would have been of no value and liable to misinterpretation. Beyond that their evidence is negative. No trace of coronium light is apparent, and, in the absence of other evidence, it must be concluded that coronium as indicated by the green line was almost entirely absent from the present corona.

The photographs taken with the spectrograph

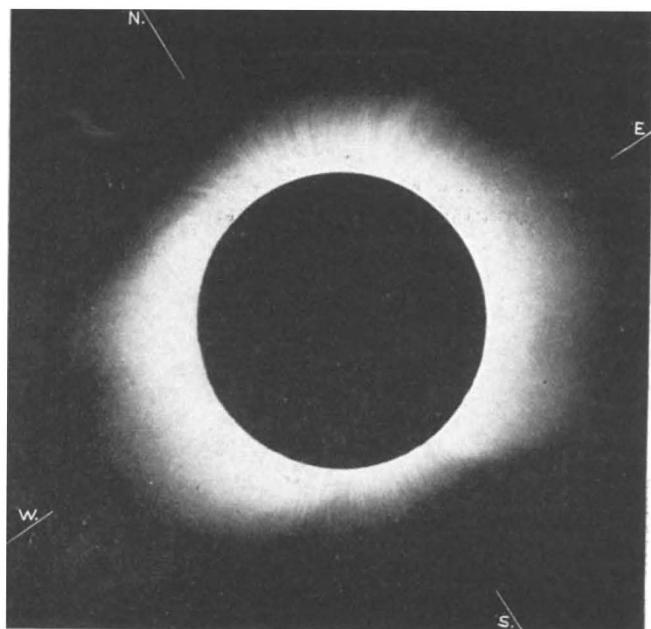


FIG. 2.—Corona, 112-117 sec., Ilford Empress Plate.

are good, though not quite so successful as had been hoped for. More cannot be said about these until they have been carefully measured.

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