OUR ASTRONOMICAL COLUMN.

FIREBALL OF OCTOBER 3.—A large number of additional observations have come to hand, and Mr. Denning writes us that the brilliant object was well observed as far north as Huddersfield and as far east as Hertford. Even at Huddersfield, where the observer was about 210 miles distant from the object, it exhibited a Venus-like lustre, and was followed until it disappeared in the mist very near the S.S.W. horizon. The new observations confirm, in general, the deductions already stated as regards the position and height of the fireball, but the exact place of the radiant point remains a little doubtful. With reference to the elevation at disappearance, this may have been less than thirty miles, for there are several observations indicating it at about twenty-four miles. The cloudy or misty condition of the sky at many places, however, hindered efforts at exact observation. Everywhere the spectators speak of the astonishing brilliancy of the object and admit that its startling aspect at first aroused fears of a calamitous sequel.

Erratum.—By a clerical error Launceston was mentioned instead of Seaton, East Devon, in NATURE, October 12, p. 116.

ANOMALOUS DISPERSION IN THE SUN.—The search for evidence of anomalous dispersion in the sun continues to attract considerable attention. Dr. Albrecht recently concluded that Rowland's measurements gave distinct indications of a mutual repulsion in close pairs of lines, such as is required by the anomalous dispersion theory. Mr. Evershed and Dr. Royds, however, have questioned the validity of this result, since it is not supported by data obtained at Kodaikanal by more direct methods (the *Observatory*, October, 1916). In agreement with Dr. St. John, Mr. Evershed finds that Rowland's separations were almost invariably overestimated; for eighteen pairs having a mean separation of 0·1920 according to Rowland, the Kodaikanal mean value was 0·1836. The tendency of Rowland was therefore to displace the violet components to the violet, and the red components to the red, thus simulating the effects of anomalous dispersion. Mr. Evershed considers that his results are decidedly against the view that anomalous dispersion is an effective agent in displacing solar lines.

Dr. St. John has also made an exhaustive examination of the cases included in Albrecht's list, and is strongly of opinion that the deviations are merely due to systematic errors in Rowland's measures of close lines (Proc. Nat. Acad. Sci., vol. ii., p. 458). He finds that the separations of pairs in the solar spectrum are identical with those obtained from terrestrial sources. "Within the limits of error, evidence of mutual influence is absent from the solar spectrum, and in so far as mutual influence is a necessary corollary of anomalous dispersion in the sun, evidence for it also is absent."

Experimental work bearing upon this question has been carried out at the Pasadena laboratory by Dr. A. S. King (Proc. Nat. Acad. Sci., vol. ii., p. 461). Anomalous dispersion effects in metallic vapours were obtained by the use of the electric furnace, in which a strong density gradient was produced by water-cooling the upper part of the tube. Tests for the mutual influence of lines were made on the mixed vapours of titanium, calcium, and chromium, in which certain lines of the two former elements fall well within the curved spectra given by the anomalous dispersion of chromium lines. When compared with the corresponding emission spectra of the mixture, and of the elements separately, the measures gave no evidence whatever of a mutual repulsion between close lines when anomalous dispersion is active.

THE VARIABLE STAR SZ CYGNI.—Extensive observations of SZ Cygni, covering the period from November, 1912, to August, 1916, have been made by F. C. Leonard (Mon. Reg. Soc. Prac. Astr., vol. viii., No. 5). The star is of the δ Cephei class, having a mean magnitude of 8·96 at maximum and 9·74 at minimum. The mean period is 15·10 days, with an interval of 6·6 days from minimum to maximum. Both range and period appear to be subject to slight variations. The star is stated to be of a reddish tinge, and to deepen in colour as the brightness diminishes.

FISHERIES INVESTIGATIONS AND DEVELOPMENT.

THE importance of utilising more fully the fisheries around our coasts was emphasised at the recent Newcastle meeting of the British Association, one day being devoted to papers and discussions on this and kindred subjects.

Prof. Herdman urged that with the view of making a rapid recovery from the effects of war, food-producing industries should be encouraged, and, among others, the inshore fisheries should be exploited. Shellfish cultivation, shrimping and prawning, whitebait and sprat fishing, and herring fishing and curing, if extended and exploited judiciously, would add to employment, increase the national food supply, and might lead to the establishment of permanent industries of a profitable nature. He illustrated by several instances how the transplantation of stunted mussels from an overcrowded area to suitable neighbouring areas resulted in the rapid production of mussels of good quality which were sold for eight to ten times the sum expended on their transplantation. As examples of local fisheries started recently, Prof. Herdman mentioned the winter sprat fishery in Morecambe Bay and the summer herring fishery in the Irish Sea.

Prof. Meek gave an account of the inshore fisheries of Northumberland, and pointed out what had been done to preserve them by legislation and to encourage them by such an attempt as that now being made to establish a mussel-bed large enough to supply the wants of the district. The importance to the nation of the fishermen of the smaller fishing stations has been emphasised during the present war. With the problem of the preservation and extension of the coastal fisheries is involved the economic consideration of better buying and selling, and also the social question of making life in the fishing village more attractive.

In his paper on the further development of the shell-fisheries Dr. James Johnstone dealt especially with the coasts of Lancashire, Cheshire, and North Wales, where such fisheries are of considerable actual value and of very great potential value. Here mussels and cockles exist in incredible abundance, though in certain areas a considerable proportion are always smaller than the specified legal size. Mussels are found to prefer shallow estuarine water of low salinity containing the drainage from cultivated land or from human communities. Dr. Johnstone dealt with the rationale of successful transplantation, and calculated that the yield in assimilable food substance of high nutritive value of a cultivated mussel-bed was probably greater than that of a similar area of land bearing a food crop. He pointed out that although mussels feed on contaminated material they can be cleansed, and regarded as pure, by placing them in an area where water coming in from the sea washes over them during the last hour of flood-tide for two to four days. Although it is practicable to develop the yield of the shell-fisheries to an enormous extent, it is difficult to see how this can be brought about without some

© 1916 Nature Publishing Group