

the council for the year:—Alloys, 220*l.*; steam-nozzles, 150*l.*; hardness tests, 150*l.*; and cutting tools, 100*l.* The alloys research has been carried on at the National Physical Laboratory, and the eleventh report will be presented at an early date. The construction of the experimental apparatus for the steam-nozzles research has been further delayed for lack of funds, but help has been promised by a grant of 500*l.* from the Turbine Blade Research Committee of the British Electrical and Allied Manufacturers' Association. It is intended to erect the apparatus at the Dickinson Street Power Station, Manchester, and the experiments will be conducted under the supervision of Prof. G. Gerald Stoney and Mr. S. L. Pearce. Hardness tests have been carried out at the National Physical Laboratory by Dr. T. E. Stanton, and it is hoped that reports will be presented this year. A bibliography on cutting tools is being prepared by Mr. G. W. Burley, and it is proposed to collect information from makers and users of cutting tools. The work of the wire-ropes research committee has been considerably delayed owing to the war; arrangements have now been made for experimental work to be carried out at Woolwich Polytechnic by Dr. W. A. Scoble. The work of the refrigeration research committee has been suspended since 1914; it is hoped that investigations may be made shortly into the physical properties of the substances used in refrigeration.

A CATALOGUE (No. 357) of rare books and manuscripts has just been issued by *Messrs. Bernard Quaritch, Ltd.*, 11 Grafton Street, W.1, and is worthy of perusal. It is of a fairly general character as to the subjects, but two sections will appeal especially to readers of NATURE, viz. those dealing with natural and physical sciences (21 pp.) and with periodicals (13 pp.). Many scarce volumes and long runs are to be found in these. The price of the catalogue is 1*s.* We notice that *Messrs. Quaritch* are about to begin the publication of the *Journal of Pomology*. It will appear at quarterly intervals under the editorship of Mr. E. A. Bunyard, who has secured the promise of assistance from many experts.

AN illustrated book on "Weeds of Farm Land," the work of Dr. Winifred E. Brenchley, of the Rothamsted Experimental Station, is to be published by *Messrs. Longmans and Co.* It will deal with various aspects of the weed problem, but especially with the relations existing between weeds and the soils and crops with which they are chiefly associated. A survey will be given in the volume of the present position with regard to the questions of prevention, eradication, and uses of weeds, also of their habits and method of distribution and the vitality of buried weed-seeds.

READERS of NATURE who are interested in ancient herbals and old-time gardening and agriculture should see Catalogue No. 81 of *Messrs. Dulau and Co., Ltd.*, 34 Margaret Street, W.1, in which are to be found particulars of 1000 works dealing with these and other scientific subjects, many the property of the late Sir Frank Crisp. An unusual feature is a collection of volumes on sundials.

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### Our Astronomical Column.

**BRIGHT METEORS.**—A fine meteor was observed on February 17 at 8h. 52m. by Mr. F. Wilson, Totteridge, and Mr. S. B. Matthey, Plumstead. It was brighter than Jupiter, and moved very slowly from a radiant at  $72^{\circ}+43^{\circ}$  near  $\alpha$  Aurigæ. The approximate height of the object was 67 to 30 miles, path 53 miles, and velocity 10 miles per second. It passed from over south-west of Needham Market to Woodbridge.

Another very brilliant meteor was observed on February 27 at 8h. 58m. by Mrs. Wilson and Miss Cook, and also by Mr. S. B. Matthey at Plumstead. The radiant was at about  $17^{\circ}+8^{\circ}$  near the horizon  $9^{\circ}$  north of west. The height of the object was 53 to 49 miles, path 95 miles, and velocity 12 miles per second. It passed from over Lydd, Kent, to about 50 miles east of Calais, France. Fireballs from Auriga and Pisces have been recorded in previous years at about the same dates as those of this year.

**TOTAL LIGHT OF THE STARS.**—The late Prof. Newcomb laid stress on the desirability of obtaining this observational constant, and several attempts have been made to do so. The latest is by Mr. P. J. Van Rhijn (Contributions from Mount Wilson Observatory, No. 173). This paper shows that there is illumination, which is probably due to (a) a faint extension of the zodiacal light, including the Gegenschein, and (b) faint auroræ. The amount of these was found by observing regions of the sky remote from the Galaxy and assuming that the starlight in these regions could be inferred from the observed number of stars of each order of magnitude. The amount of each of these is discussed, and it is concluded that the total amount of light received from all the stars in both hemispheres is equal to 1440 stars of magnitude 1.00, Harvard visual scale. The following are the values of extra-galactic sky brightness per square degree found by different observers, the unit being a star of magnitude 1.00:—Newcomb, 0.029; Burns, 0.050; Abbot, 0.075; Yntema, 0.140; and Van Rhijn, 0.130. The magnitude of the full moon is about  $-12$ ; it is, therefore, about 140,000 times as bright as a star of magnitude 1.00, or a hundred times as bright as all the stars together.

**STAR CLUSTERS.**—*Scientia* for March contains the fourth of a series of papers on clusters by Dr. Harlow Shapley. Dr. Shapley quotes a remark that distance introduces simplification in our study of the clusters; it makes apparent magnitudes equivalent to absolute ones, since all the components are at practically the same distance from us. He then proceeds to consider the local cluster to which the sun belongs, which he regards as defined by Dr. Charlier's research on the distribution of the B stars in space. The conclusion was that they form a flattened cluster, with greatest diameter 4000 light-years. This is supposed to be merely one unit out of many that go to make up the galaxy. Its equatorial region is marked by a zone of bright stars, to which attention was directed by Sir J. Herschel and Dr. B. A. Gould. Its plane is inclined some  $15^{\circ}$  to the medial line of the galaxy. Dr. Charlier puts the centre of the local cluster in Carina, some 250 light-years from the sun; while Dr. Shapley makes the distance only 150 light-years.

Since from analogy the cluster is likely to be moving with respect to its neighbours, the two star-drifts would appertain respectively to cluster and non-cluster stars. It is left an open question to which category the sun belongs. Viewed telescopically from the Hercules cluster, the local cluster would seem to be mainly composed of B stars, with a smaller number of giant M ones. The sun would be of the twentieth magnitude, too faint for visual observation, though it might be photographed.