

FOR printing-out photographic processes, such as carbon printing, Mr. S. S. Richardson in the *British Journal of Photography* of January 24 recommends the new "Pointolite" lamp. This lamp needs so little current that special wiring is not necessary, and it will allow of, say, six negatives being printed from simultaneously, the exposure being about three-quarters of an hour with negatives of average density. Mr. Richardson also recommends the iron arc if a current of 5 or 6 amperes is available, using iron instead of the usual carbon poles. A lamp so arranged will run sometimes for hours without attention, as the iron burns away very slowly. At a distance of 50 centimetres the exposure required is about twenty minutes. With such "point" sources of light an ordinary glass negative may be printed "reversed" for the single transfer carbon process if ordinary care is taken to prevent troublesome reflections and movement of the negative during the exposure.

A PAPER on electric welding and three others on oxy-acetylene welding were read at the Institution of Mechanical Engineers on January 24. In his paper on electric welding Mr. Thomas T. Heaton says that in his opinion—based upon many years' experience—each known system of welding has its proper sphere, and that probably any given method may be the best in its respectively most suitable application. In the Benardos system of arc welding, direct current is employed at 90 volts and 250 to 500 amperes, according to the thickness of metal. The arc may be 1½ in. to 2 in. in length, and the heat may be spread over a fairly large surface, thus avoiding extreme local stresses. The work is positive to a carbon electrode. In the Kjellberg system a metallic electrode is used instead of carbon. The work is negative to the electrode, so that the natural tendency is to deposit the metal of the positive electrode on to the work. The electrode is coated with a fusible silica flux, which prevents oxidation and insulates the electrode. The arc dissipates this flux, leaving no slag. Generally, the electrodes are of 3/16 in. diameter soft iron wire. Mr. Heaton does not find this system to be satisfactory for plates thinner than 0.25 in. The quasi-arc process, invented by Mr. Arthur Strohmenger, of London, also employs metallic electrodes, and some excellent results are obtained by it. Various coatings may be applied to the electrodes, and may be of such a nature as to supply constituents that are burnt out of the metal in welding. Blue asbestos yarn is especially preferred as a coating in welding iron or mild steel, as it forms a reducing flux, and it may be smeared with a composition such as sodium silicate or aluminium silicate, etc., to vary the fusing temperature of the yarn. Descriptions of some useful testing machines for welds are included in Mr. Heaton's paper.

Messrs. H. K. Lewis and Co., Ltd., have in the press two books by Sir J. W. Barrett, viz. "A Vision of the Possible: What the R.A.M.C. Might Become" and "The War Work of the Y.M.C.A. in Egypt," illustrated. The latter work will contain a preface by Gen. Sir E. H. H. Allenby. *The Library Press, Ltd.*, is bringing out "Practical Shell Forging and the Plastic Deformation of Steel and its Heat Treatment," by C. O. Bower, of Messrs. Armstrong, Whitworth, and Co., Ltd. One object of the work is to show the ways in which hydraulic plant can be profitably employed in peace-time production. Messrs. J. M. Dent and Sons, Ltd., give notice of "New Town: A Proposal in Agricultural, Industrial, Educational, Civic, and Social Reconstruction," edited by W. H. Hughes.

A NEW weekly periodical is about to be published (at 8 Bouverie Street, E.C.4) entitled *Ways and Means: A Weekly Review of Industry, Trade, Com-*

*merce, and Social Progress.* Among the editorial features promised in the prospectus issued are Colonial development, expert opinion, industry and money, Government finance, education in relation to industry, industrial administration, reconstruction, art in industry, science and industry, organisation and system, and welfare.

OUR ASTRONOMICAL COLUMN.

BORRELLY'S COMET.—This comet was under observation by Mr. R. L. Waterfield in Cheltenham during January. On January 9 it was a fairly easy object with 3-in., the magnitude being between 9.0 and 9.5; on January 26 it was still visible with 3-in., but much more difficult. The following is a short extension of the ephemeris (for Greenwich midnight):—

	R.A.	N. Decl.	Log r	Log Δ
	h. m. s.			
February 6	6 31 57	66 14	0.2219	9.9607
10	6 36 17	66 6	0.2281	9.9815
14	6 41 48	65 52	0.2345	0.0014
18	6 48 20	65 34	0.2410	0.0203
22	6 55 39	65 11	0.2476	0.0381

REID'S COMET (1918a).—Circular No. 43 of the Union Observatory, Johannesburg, gives the following positions of this comet made by Mr. H. E. Wood, and the orbit which he deduced from them:—

G.M.T. 1918	R.A. 1918.0	S. Decl. 1918.0
	h. m. s.	° ' "
June 13, 1968	9 15 36.52	9 5 55.3
16, 1986	9 16 47.12	11 58 44.8
19, 1982	9 17 4.48	14 40 51.5

$$T = 1918 \text{ June } 5^{\text{h}} 27^{\text{m}} \text{ G.M.T.}$$

$$\omega = 194^{\circ} 7' 18''$$

$$\Omega = 17^{\circ} 49' 28''$$

$$i = 70^{\circ} 8' 41''$$

$$\log q = 0.04194$$

Middle place, obs.-comp. R.A. — 11", decl. 0". The orbit does not show a close resemblance to any in the catalogues. This was the only comet observed in 1918 that did not belong to the Jupiter family.

ASTRONOMY IN THE "TIMES."—We directed attention last week to the important new features in the meteorological reports in the *Times*, and have now pleasure in referring to another scientific innovation which appeared in the issue for February 1. A map is given, on the zenithal equidistant projection, of the stars and planets visible in London at 10 p.m. in mid-February, together with the path of the moon and our satellite's positions and phases at two-day intervals. There is accompanying letterpress by an astronomical correspondent, describing the leading points of interest in the constellations and directing attention to the approaching conjunction (in 1921) of Jupiter and Saturn, which are now such conspicuous objects. If, as we understand, this is the first of a series of monthly maps and articles, they are likely to lead to a considerable awakening of interest in astronomy on the part of the general public.

THE ENERGY OF MAGNETIC STORMS.—Dr. S. Chapman contributes a paper on this subject to the *Monthly Notices* for November last. He considers that the sun is the source of energy, and that it is transmitted by streams of electric corpuscles. These ionise and charge the absorbing layer in the atmosphere. The accumulation of charge continues until the electrostatic repulsion overcomes gravity, when the electrified gas is impelled upwards, the atmosphere thus losing both its charge and part of its substance. It was formerly considered that to make the sun the source of energy would involve an inconceivable amount of output from the sun, but under the new theory this is not the case.