

Extracts from Publications.

Some Interesting Nebulæ.—The nebulæ have an interest peculiarly their own. Their beautiful forms, their remarkable connection with the stars and the mysterious manner in which they pervade some parts of the heavens render the study of these strange objects very fascinating. Among the various forms the spiral is the most striking, and the profusion in which nebulæ of this type are found has led astronomers to devote much effort to portray them.

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A number of photographs have been made during the past year, with the Crossley reflector, of nebulæ hitherto unphotographed, and in the course of this work three nebulæ of rather unusual form have been discovered.

The first of these is the spiral nebula N. G. C. 5921 ($\alpha = 15$ h. 7 m. 0 : $\delta = +5^{\circ} 26'$). It has a nebulous central star, and from this extends on each side a nearly straight line of matter, from the ends of which spring two spiral branches; there are also a number of fainter spiral whorls. The central oval is about 1'6 long. The second nebula is N. G. C. 1300 ($\alpha = 3$ h. 15 m. 2 : $\delta = -19^{\circ} 46'$), which somewhat resembles the former.

The nebula N. G. C. 7293 ($\alpha = 22$ h. 24 m. 3 : $\delta = -21^{\circ} 21'$) is a most interesting object, and as far as is known entirely unique among nebular forms. Discovered before 1824 by Harding, visual observations give absolutely no idea of its true form, and it is described in the N. G. C. of Dreyer as p F, v L, E or bi N (Aww. 48). It is 13' in extreme diameter, making it the largest ring-formed object known, but from the original negative it is easily seen to be in reality two turns of a helix. It is suggested that this interesting object be referred to as "The Helical Nebula in Aquarius."

[*Journal of the Royal Astronomical Society of Canada,*

Atmospheric Electricity during a Dust Storm.—The writer (Mr. W. A. Douglas Rudge) has shown (*Philosophical Magazine*, May 1912) that during a dust storm the charge upon the dust (if siliceous) is positive, while that upon the air at the same time is negative, and he was led from this to devise an electrical machine by means of which charges of both positive and negative electricity might be obtained during a dust-storm. The essential parts are:—(1) A small insulated disc

coated with radium attached to a wooden rod about two metres in height; (2) a large hollow vessel with a fine wire gauze bottom; and (3) a pair of insulated spheres to serve as dischargers. The hollow vessel generally used was a five-gallon petrol tin supported upon an insulated rod, a distance of about 20 cm. above the ground, and directed with the open end towards the on-rushing dust. Much of this dust is carried through, but a considerable portion is retained, and any charge it may possess is given up to the vessel.

This charge was invariably positive. The radium-coated conductor, however, took the negative potential of the current of air blowing past it, so that the two balls acquired opposite charges, and a torrent of sparks as continuous as that furnished by an induction coil passed between them. On some occasions the sparks reached a length of 1.5 cm., showing that the potential difference between the conductors must have been at least 40,000 volts when the apparatus was set up in the open veld.

An ordinary vacuum tube having a radium-tipped wire attached to an electrode, the other electrode being earthed, will light up brilliantly during the passage of a dust-storm. A brush discharge is seen to proceed from the electrode and the shape of the positive electricity is escaping from the earth into the atmosphere.

[*Nature.*

High-level Measurement of Solar Radiation.—In No. 1, Vol. XXXVII, of the *Astrophysical Journal*, Prof. Very discusses the conditions affecting the measures of solar radiation at high levels. Taking measures made up to nearly 30 km. he shows that aqueous vapour, the chief atmospheric absorbent of solar radiations, is still present, in appreciable quantities, at these great altitudes; thus the limits of the aqueous atmosphere are extended much further than some meteorologists have thought to be possible.

Having reduced observations made at sea-level, 4,420 and 13,700 metres, he finds thermal equivalents, at these heights, of 1.5, 2.00, and 2.86 cal./sq. cm. min. respectively, and by plotting these results gets a value for the solar constant of radiation of 3.5 cal./sq. cm. min.

[*Nature.*

The Distribution of Spectroscopic Binary Stars.—From Prof. Stroobant we have received an abstract from the Comptes Rendus (Vol. clvi, p. 37), in which he has discussed the distribution of spectroscopic binaries, as compared with other stars, in the celestial sphere. Dividing the sphere into 20° zones of galactic latitude, he finds that of the 306 stars given in Campbell's second catalogue of spectroscopic binaries, 217 lie within the zone $+30^\circ$ to -30° galactic latitude, and only 89 without it. For naked eye stars generally the proportion is 3,154 to 2,565, according to Howzean.

This preponderance near the Milky Way is found to be due to the relatively large number of helium stars among the binaries, about 35% of the total, for, according to Pickering, 93% of 686 helium stars are to be found in the galactic zone.

[*Nature.*

The use of a plane grating in stellar spectroscopy.—Some preliminary tests have been made at the Dominion Observatory, Ottawa, of a plane grating used as the dispersion piece of a stellar spectrograph. The grating used is one ruled by Dr. J. A. Anderson, who is now regularly ruling excellent gratings at the Johns Hopkins University, and has a ruled surface of $2\frac{7}{8} \times 3\frac{1}{4}$ inches with 15,000 lines to the inch. It was employed in the Littrow form of spectrograph, giving a linear dispersion of 17.5 Angstroms per millimetre, and gave excellent definition over a nearly flat field extending from λ 4800 to λ 3500. The photographs secured show a much more uniform intensity over a wide range than do those taken with a three-prism spectrograph, and for this reason will be especially useful. In the red, where the prismatic spectrum is so compressed, and in the violet and ultra-violet, where it suffers considerable absorption, the grating spectrograph will prove very advantageous, and the results of the further experiments to be made will be awaited with interest.

[*Journal of the Royal Astronomical Society of Canada.*

Solar Radiation during the Eclipse of April 17, 1912.—In the form of an extract from the Comptes Rendus de la Societe Scientifique, of Warsaw, we have received a paper in which Dr. W. Gorcynski describes the observations of the insolation made at Warsaw during the partial eclipse of the Sun which occurred on April 17, 1912. The diminution of the solar radiation readings began about half an hour before the eclipse, and remained below the normal for the date for nearly the same time after. The maximum reduction of the solar radiation attained 89 per cent. at Warsaw, where 0.88 of the disc was covered at maximum phase, and the radiation curve agrees

fairly well with the phase curve. Between noon and 4 P.M. each sq. om. of surface received 110 great calories, at normal incidence, less than usual, and the drop in temperature, as recorded in the screen, was between 2° and 3° C.

[*Nature.*

Bantu Star Names.—No. 12, vol. xii, of *Man* contains an interesting article by Miss A. Werner discussing the names by which the stars are described in Bantu by the tribes of Nyasaland. Miss Werner's general impression is that nearly, if not quite, all the peoples with whom she has come into contact have lost much star knowledge which they once possessed. The name for the Pleiades is always etymologically connected with agriculture, being derived from a root, "lima" meaning "to cultivate," thus indicating that the Zulus, Swahilis, etc., have employed this asterism, as have so many other primitive races, as a substitute for the modern calendar. The "belt" stars of Orion seem always to be connected with hunting, and the name for Venus conveys generally the idea that the planet is the Moon's wife. The names applied to Jupiter also suggest a connection with hunting, a native explanation being that a hunting expedition should start on a night when Jupiter is overhead just before dawn. Several other of the names given are of special interest, and tend to show that the astronomical observations of primitive races are essentially utilitarian in character.

[*Nature.*

The Explosion of Worlds.—Some interesting speculations as to the possibility of such a world as the earth being shattered by the explosive energy of the now pent-up internal forces are published by Mr. Hudson Maxim in the February number of the *Fortnightly Review*. Among other things, he shows that the pressure of the earth's crust is so great that the most powerful explosive known, in any quantity, would fail to do more than shake it locally. Gravitational pressure is so enormous that were two solid steel balls, as large as the earth and as hard as the Harveyised surface of armour-plate, gently placed in contact they would flow together like water, and could have no variation from a true sphere greater than fifty miles high. By such arguments Mr. Maxim demonstrates the enormous strength and rigidity of the terrestrial sphere, and shows that it is immune from the effects of any shattering force less than the collision of the solar system with another celestial system.

[*Nature.*