

basalts of County Antrim, and consists of basic lava flows covering Mesozoic beds, and at Scawt Hill occurs the "neck" of one of the volcanoes from which the lavas came. A few years ago one of the members of the section came unexpectedly on a basic dyke traversing the dolerite neck. The neck has been found to be a fine-grained ophitic dolerite. The dyke is a granitoid basic rock, and may be classed as a diabase without olivine. A section of the chalk taken two yards from the dyke showed it to be converted into a typical crystalline limestone with large crystals of calcite. The geologists of the Belfast Naturalists' Field Club made during the excursion the observation that even at a distance from the dyke the band of chalk in contact with the dolerite neck seemed to have undergone a similar change, and to have been converted into hornstone.

In the *U.S. Monthly Weather Review* of January last references are made to interesting communications by Mr. R. F. Stupart, director of the Canadian Meteorological Service (dated March, 1909), relating (1) to the establishment of new stations in Newfoundland and Labrador, and the proposed extension of storm warnings and weather forecasts to Newfoundland, and (2) to the supply of a complete equipment to several stations in the north of Canada, extending as far as Fort Macpherson (lat. $67^{\circ} 27'$, long. $134^{\circ} 57'$ W.). In connection with the source of "cold waves" frequently experienced in North America, Mr. Stupart thinks that the study of the far north with trustworthy barometer readings will be most valuable. He remarks that the persistent high pressures found there in some seasons apparently owe their origin to upper currents from the equator coming to earth farther north than usual, and that "we may very probably in the future connect the situation in the equatorial regions and trade-wind belts with that in the high latitudes."

THE first complete account of the new method which has been adopted by the Gesellschaft für drahtlose Telegraphie to secure an almost undamped series of oscillations in the secondary circuit of the sender is given by Prof. Fleming in the *Electrician* for June 11. The primary spark is divided into eleven very short sparks of about 0.01 inch in length, which are formed between twelve discs of copper, which may be water-cooled. The damping is so great that not more than two or three oscillations occur in the primary circuit, and the oscillations in the secondary are therefore free oscillations, which are only slightly damped. The device evidently marks a distinct advance in wireless telegraphy.

LAST year in the *Comptes rendus* and in *Le Radium* M. J. Becquerel described experiments on the electric discharge through vacuum tubes which appeared to indicate that, in addition to the canal rays, there existed positive rays which could be deviated by a magnetic field by amounts comparable with those to be expected if the rays were composed of free positive electrons. In the *Journal de Physique* for June, M. A. Dufour describes his own work on the same subject. He has repeated and extended M. Becquerel's experiments, and comes to the conclusion that the observations do not warrant the statement that the deviable rays observed are due to free positive electrons.

MR. R. H. COLLINGHAM contributes an article in *Engineering* for June 18 dealing with Ilgner-operated winding-engines. The principle of the Ilgner system is the employment of a motor-generator set coupled mechanically to a heavy fly-wheel and electrically to the motor driving the mill or winding gear. The motor of the motor-generator is driven off the power mains, and

the function of the fly-wheel is to minimise the variation in the load drawn from the source of supply. All the heavy loads which come on the mill are met from the store of energy in the fly-wheel. In order to obtain this result, an automatic slip-regulating device is provided in the rotor circuit of the induction motor driving the motor-generator set, which regulates the amount of slip on the induction motor according to the amperes taken by the stator, the slip-regulating device only coming into operation when the stator current has reached a certain fixed value. When this value has been attained the regulating device increases the slip of the induction motor, causing the speed of the set to drop; the fly-wheel then gives up energy corresponding to the given variation in velocity. By this means the load on the supply mains is kept much more steady than would be the case if no fly-wheel were employed. Mr. Collingham treats especially the mechanics of the problems involved with the view of finding expeditiously the weight of wheel, size of motor, &c., required in given cases.

IN our article upon the Astrographic Congress at Paris (June 10, p. 440) it was stated that Rome was represented by Signor Lias. We are asked by Dr. P. Emanuelli to state that this should have been Signor Lais, who is vice-director of the Vatican Observatory, and was the representative, not of Rome, but of the Vatican.

WE have received from Messrs. Flatters and Garnett, Ltd., of Manchester, a copy of their conveniently arranged catalogue of collecting apparatus, nature-study appliances, cabinets, museum glassware, glass-top boxes, pocket lenses, and so on. The list is well illustrated, and reference to its contents is made easily.

MR. JOHN MURRAY has published a second edition of Mr. R. H. Lock's "Recent Progress in the Study of Variation, Heredity, and Evolution." The first issue of the book was reviewed at length in *NATURE* of April 18, 1907 (vol. lxxv., p. 578), but it may be pointed out that several alterations and additions have been made in the present edition. A short list of references has been added at the end of each chapter; the different chapters have been revised and supplemented, and a new chapter has been added.

"A SHORT HISTORY OF ENGLISH AGRICULTURE," by Mr. W. H. R. Curtler, is announced by the Oxford University Press for early publication. As the agriculture of the Middle Ages has often been ably described, Mr. Curtler devotes the greater part of his book to the agricultural history of the subsequent period, especially the seventeenth, eighteenth, and nineteenth centuries.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JULY:—

- July 3. 14h. 30m. Uranus in conjunction with the Moon (Uranus $2^{\circ} 22'$ N.).
7. 17h. Mercury at greatest elongation ($21^{\circ} 11'$ W.).
8. 3h. 46m. Mars in conjunction with the Moon (Mars $1^{\circ} 21'$ N.).
11. 15h. Uranus at opposition to the Sun.
15. 14h. Saturn at quadrature to the Sun.
18. 17h. 50m. Venus in conjunction with the Moon (Venus $3^{\circ} 5'$ S.).
19. 18h. Mars at greatest heliocentric latitude S.
20. 17h. 39m. Jupiter in conjunction with the Moon (Jupiter $4^{\circ} 22'$ S.).
23. 5h. 17m. Mercury in conjunction with Neptune (Mercury $1^{\circ} 6'$ N.).
25. 19h. Mercury in perihelion.
30. 22h. 4m. Uranus in conjunction with the Moon (Uranus $2^{\circ} 16'$ N.).

COMET 1909a (BORRELLY-DANIEL).—Several observations of this comet are recorded, and an ephemeris for it is given, in No. 4333 of the *Astronomische Nachrichten*. Neither photographs nor eye observations show any remarkable features, whilst the ephemeris indicates that the brightness is declining; on July 16 the comet will be but about one-third as bright as when discovered. The distance from the earth is, at present, about 1.09 astronomical units; and is rapidly increasing.

THE SHAPE OF THE PLANET MERCURY.—Referring to a recent statement by Mr. Levander, that the equatorial diameter of Mercury has been shown to exceed the polar diameter, M. R. Jonckheere, in No. 4333 of the *Astronomische Nachrichten*, expresses the belief that the opposite is the case. His observations, made during the most recent transit of Mercury, indicated that the vertical diameter was the greater, the values being, vertical = 9.46", equatorial = 8.73"; this is supported by other observers, whose results he gives. At present the positions of the equatorial and polar diameters of the planet are not known, but M. Jonckheere contends that the statement that the greater diameter is the one parallel to the celestial equator is, in the face of the evidence to the contrary, inadmissible.

OBSERVATIONS OF SUN-SPOTS, 1908.—The results of the first year's regular observations of sun-spots at the Royal Observatory at Capodimonte (Naples) are given by Signor E. Guerrieri in No. 6, vol. iii., of the *Rivista di Astro-nomia* (Turin). The sun was observed on 304 days, and on five days was seen to be free from spots, whilst the mean daily frequency of spot groups for the year was 5.3. The first half of the year showed an excess of groups in the ratio 3/2, but the analogous ratio for single spots was 4/5; altogether, 1606 groups and 9262 individual spots were observed during the year. The observations are tabulated and discussed in several different ways, and, if continued regularly, will form a useful supplement to the work so ably performed by the other Italian observers.

OBSERVATIONS OF SATURN AND ITS RINGS.—In No. 4331 of the *Astronomische Nachrichten*, M. Schaer records the observations of Saturn and its ring system made at the Geneva Observatory, with the 40 cm. Cassegrain reflector constructed by himself, during the period September 18, 1908, to January 24, 1909. The chief feature recorded is the discovery of the new dark ring announced on October 7, 1908. This ring was seen, but thought to be the shadow of the bright rings, on previous occasions, but on October 5 it was seen to extend to the right and left, and was therefore judged to be something more than shadow; on October 6 the dark ring was seen to be separated, and the planet, with its usual colour, was seen through the interstice, which was about 3" to 4" long and 0.5" to 1" broad. In January of the present year the new ring was seen more easily than during the preceding months.

M. Schaer's observations also suggest the presence of a cloudy, absorbing atmosphere, and the occurrence of slight changes in the white ring between the crape-ring and the Cassini division. The invisibility of the rings when their plane passes through the earth is probably due to the masking effect of the newly discovered outer dark ring.

TABLES FOR THE REDUCTION OF "STANDARD COORDINATES" TO RIGHT ASCENSION AND DECLINATION.—In No. 4329 of the *Astronomische Nachrichten* Herr A. Hnatek published a series of tables for the computation of α and δ from the standard coordinates given in the catalogues of the international *carte du ciel*. A few copies of these tables, printed on stout paper have been prepared, and may be obtained from the publishers for one mark per copy.

THE TRANSVAAL OBSERVATORY, JOHANNESBURG.—From the *Observatory* (No. 410, p. 262, June) we learn that from July 1 next the institution directed by Mr. R. T. A. Innes is to be known as the Transvaal Observatory,

Johannesburg, South Africa. The instrumental equipment is to be increased by the addition of a large refractor for visual work, and a photographic astronomical telescope, the gift of Mr. Franklin Adams, so that this institution will now rank as an astronomical, as well as meteorological, observatory.

THE COMETS OF 1907 AND 1908.—In a brochure published by Prof. Kobold, comet observers will find a very useful summary of the cometary phenomena of 1907 and 1908. Observations of fifteen comets were made during those two years, and for each object Prof. Kobold gives a short summary of the observed phenomena, a set of elements where available, and a table of references to the publications in which the observations were severally recorded.

THE ROYAL SOCIETY CONVERSAZIONE.

THE ladies' conversazione at the Royal Society is always a brilliant function, and last week the presence of delegates and other distinguished foreign guests from the Darwin celebration at Cambridge added to its interest. The conversazione was held on June 24 in the rooms of the society at Burlington House, and the guests were received by Sir Archibald Geikie, K.C.B., president. Many of the exhibits were also shown at the conversazione held in May, and were described in *NATURE* of May 20 (vol. lxxx., p. 347). Summaries of the other exhibits are given below, based upon the descriptions in the official catalogue, related subjects being here grouped together for convenience of reference.

Dr. W. N. Shaw, F.R.S.: Representation of temperatures and pressures in the atmosphere up to a height of fifteen miles, on July 27 and 29, 1908.—A. Fowler: Photographs of the spectrum of scandium. The photographs show the varying intensities of the scandium lines in the arc flame, normal arc, and the arc in hydrogen. Corresponding differences are found in the spectra of sun-spots and prominences.—Messrs. Zeiss: Liquid crystals observed under high temperatures with polarised light by micro-projection apparatus.—Dr. F. Edridge-Green: Spectroscope for estimating colour perception. In the focus of the instrument are two movable shutters, either of which is capable of moving across the spectrum. By means of the two shutters any given portion of the spectrum can be isolated. Each shutter is controlled by a drum graduated in wave-lengths, so that the position of the edges of the shutters can be known.—C. E. S. Phillips: Permanently luminous watch dial and military night compass. The watch dial is transparent (glass), and the figures are painted upon its upper surface. The dial is backed with a compound containing a minute quantity of RaBr. (radium bromide), which renders it luminous, so that the time may be easily read in the dark. The compass is arranged upon the same principle. By means of a luminous disc and strip, direction may be determined at night.

W. M. Mordey: The effect of electrostatic condensers in preventing or extinguishing arcs. A suitable condenser placed in shunt to an arc, or in shunt to a resistance in series with an arc, will instantly extinguish the arc. If connected in shunt to the contacts before they are separated it will prevent the formation of an arc even in a circuit having considerable electromotive force.—The Linolite Company: Metallic filament "tubolite." The metal filament is held at each end by a zig-zag spring to take up the expansion, and is supported by anchors at two intermediate points. The lamp may be placed in any position, and can be run on an alternating current or direct current circuit.—Hon. C. A. Parsons, F.R.S.: (1) Model of leakage path device for regulating voltage of alternators. The apparatus depends on the following very simple fact, that while an alternating current cannot directly produce a unidirectional field, it can have a strong action in diminishing magnetic flux. When applied to an alternator, the field magnets of the exciter are provided with a leakage path, around which windings carrying alternating current are placed. (2) Some samples of the blades used in steam