

the second child, but there is no conclusive evidence that after a mother has had two children there is any change in her tendencies.

IN the *Monthly Review* for August Mr. J. E. S. Moore discusses "the cancer problem to-day," in which he details recent investigations into the cytology of malignant growths; and in the *Fortnightly Review* Dr. Alfred Mumford writes on the alleged physical degeneration of the race. The general trend of this article is that the deterioration in the vigour and health of the British race as a whole has been exaggerated, and that all the combined effort of the past for the permanent improvement of the race cannot have been without result.

At a special meeting of the *Accademia dei Lincei* held on June 5, the results of the competition, which closed on December 31, 1902, for the royal prizes of the academy were made known. In the section of philology, a royal prize is awarded to Prof. A. Trombetti for a work on the genealogical connection between the languages of the ancient world. The prize for astronomy is divided between Prof. E. Millosevitch and Vincenzo Reina, and that for philosophical science between Prof. Sante Ferrari and Prof. Covotti. To celebrate the tercentenary of the academy, which is the oldest institution of its kind in the world, it is announced that Prof. Pirota is preparing for publication the botanical works of Prince Federico Cesi, who, with Galileo Galilei, founded the *Lincei* in 1603.

IN the *Physikalische Zeitschrift* (No. 15) H. Mache concludes that the emanation from the Gastein thermal spring, which is so strongly radio-active, is identical with that of radium, as the activity of both emanations decays according to the same law. Moreover, the activity induced in other bodies by the emanation from the water is of the same character as that caused under similar conditions by radium. In the same number E. F. Burton shows that the diminution in the conductivity of air enclosed in a metal vessel which is produced by surrounding the vessel with water is proportional to the thickness of the aqueous layer. The view that the radiations causing the discharge come from an external source is thus confirmed. It is also shown that, on diminishing the pressure of air in the vessel surrounded by water, the conductivity falls off continuously with the change of pressure.

IN the *Physical Review* for June, E. L. Nichols and Ernest Merritt give an experimental confirmation of Lommel's contradiction of Stokes's law that, in fluorescence, the fluorescent light is always of greater wave-length than the exciting light. The variation in the intensity of the light throughout the fluorescence spectra of such substances as fluorescein, eosin, and naphthalene-red was measured by means of a spectrophotometer, and it is shown that, whatever be the wave-length of the exciting light, the curve connecting intensity of light with wave-length in the fluorescence spectrum is always of the same character. The maximum of intensity in the excited spectrum may have a wave-length much smaller than that of the exciting source. Thus in the case of eosin, with an exciting light of wave-length  $\lambda$  585-605, the maximum in the fluorescence spectrum is at  $\lambda$  580, the whole spectrum extending from  $\lambda$  535 to  $\lambda$  640.

PART ii. of the *Bulletin* of the French Physical Society for 1904 contains a description by A. Turpain of a new apparatus for cleaning large quantities of mercury. The

cleaning agent is a solution of mercurous nitrate, and the mercury, after being cleaned, is dried by means of concentrated sulphuric acid, any free acid in the mercury being subsequently removed by potash. The apparatus works automatically during long periods, and needs little attention.

IN the July number of the *American Journal of Science* Mr. H. A. Bumstead describes experiments on atmospheric radio-activity, which indicate that the activity acquired by a negatively charged wire exposed in the open air at New Haven, is of a two-fold character. From the rate of decay it is concluded that thorium as well as radium excited activity is present. With a three-hour exposure of the wire, 3 to 5 per cent. of the initial effect is due to the thorium activity, and with a twelve-hour exposure the thorium activity is sometimes 15 per cent. of the whole. Messrs. Trowbridge and Rollins communicate that the electrical resistance of an aluminium wire is not altered to a measurable extent when subjected to the action of radium.

THE *Geographical Journal* for August contains a very clear map showing the work of the National Antarctic Expedition. The map is the work of Lieut. Mulock, R.N., who joined the *Discovery* from the *Morning* in February, 1903. The positions fixed by observations, magnetic variations, soundings, heights, and the tracks of the sledge travellers are clearly shown, as well as the track of the ship to her furthest point along the coast of King Edward VII. Land. An inset map shows the position of the discoveries with reference to the circumpolar area. The same number also contains the paper on "The German Antarctic Expedition" which was read before the Royal Geographical Society in April last by Dr. E. von Drygalski. It is illustrated by some remarkable reproductions of photographs of icebergs, &c.

THE current *Century Magazine* contains two contributions which should be of interest to all students of nature, one, by that careful American observer, John Burroughs, on "What do Animals Know?" in the course of which a good deal of out-of-the-way knowledge is given in a charming manner, the other, illustrated by some striking engravings (one in colour), on "The Colossal Bridges of Utah," which deals with the wonderful arches or natural bridges that are to be found near the head of White Cañon, in San Juan County, Utah. One of these bridges, named by the discoverers the Caroline, measures two hundred and eight feet six inches from buttress to buttress across the bottom of the cañon. Its height is one hundred and ninety-seven feet from the surface of the water, while its thickness at its highest point is one hundred and twenty-five feet. The floor of the bridge is one hundred and twenty-seven feet wide, so that, as is pointed out, an army could march over it in columns of companies, and still leave room at the side for a continuous stream of artillery and baggage waggons. Two other magnificent bridges, named respectively the Augusta Bridge and the Little Bridge, are described and figured in the article, which is well worth perusal.

#### OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR ENCKE'S COMET.—A set of elements for Encke's comet, corrected only for the Jupiter perturbations of the first order between 1901 and 1904, is published by MM. Kaminsky and Oculitsch in No. 3962 of the *Astronomische Nachrichten*. These elements are given below, together with an extract from a daily ephemeris for the period August 1 to October 16:—

Epoch and Osculation 1904 November 9.0 (M.T. Berlin).

$$\begin{aligned} M &= 341 \quad 3 \quad 39 \\ \pi &= 159 \quad 2 \quad 39 \\ \Omega &= 334 \quad 27 \quad 8 \\ i &= 12 \quad 35 \quad 37 \\ \phi &= 57 \quad 54 \quad 20 \\ \mu &= 1075'' \cdot 666 \\ \log a &= 0 \cdot 34555 \\ T &= 1905 \text{ Jan. } 11 \cdot 8 \text{ h. M.T. Berlin.} \end{aligned}$$

Ephemeris oh. (M.T. Berlin).

1904		a (app.) h. m. s.	$\delta$ (app.) °	log r	log $\Delta$
Aug. 13	...	1 51 3	+21 10'2	0'3685	0'2634
" 17	...	1 52 13	+21 45'0	0'3615	0'2421
" 21	...	1 52 57	+22 19'8	0'3542	0'2201
" 25	...	1 53 14	+22 55'1	0'3467	0'1970
" 29	...	1 52 59	+23 30'4	0'3390	0'1732
Sept. 2	...	1 52 9	+24 5'7	0'3309	0'1485
" 4	...	1 51 28	+24 23'4	0'3268	0'1358
" 6	...	1 50 36	+24 41'2	0'3226	0'1229

THE REVISION OF THE CAPE PHOTOGRAPHIC DURCHMUSTERUNG.—In the third volume of the Cape Durchmusterung Sir David Gill referred to several lists of stars which Prof. Kapteyn had prepared in order that the objects might be re-observed and the origins of the discrepancies between the Cape and other catalogues discovered. The work of revision was commenced by Mr. Finlay, but has been continued, since 1896, by Mr. Innes. Parts i., ii., and iii. of vol. ix. of the Cape Observatory *Annals* contain the results of this revision, giving the observer's full notes and copious remarks concerning each object observed. Mr. Innes believes that not a single uncoloured star of the ninth magnitude or brighter, and south of declination  $-19^\circ$ , is now missing from the catalogue.

Many of the questionable objects have been found to be variables or highly coloured, whilst others are fainter than the ninth magnitude. Part ii. is especially devoted to full particulars of each variable star observed at the Cape between 1896 and 1902, the elements, the curve, the region-charts, and all the available information—or references to the same—being given for each of the seventy-three objects observed.

A summary of the number of stars in the C.P.D. exhibits several interesting points. For example, whereas M. Stratonoff found that the B.D. (dec.  $+90^\circ$  to  $-20^\circ$ ) gave a mean of 4.895 stars brighter than the ninth magnitude for every square degree, the corresponding value in the C.P.D. (dec.  $-19^\circ$  to  $-90^\circ$ ) is 5.85. Part of this difference, at least, may, however, be due to a difference of magnitude standards. The total number of stars now contained in the C.P.D. is 91,358, and the richest region is near to  $\eta$  Argus, for in the  $-59^\circ$  zone, between 10h. and 11h., there are 256 stars, or 32.7 per square degree, brighter than the ninth magnitude.

Part iii. tabulates, and comments on, the errors found by Prof. Kapteyn—and others discovered since—in other southern star catalogues for the regions south of dec.  $-19^\circ$ , and concludes with a table of reference to all the published errata.

DETERMINATION OF LATITUDE AND ITS VARIATIONS.—In No. 3962 of the *Astronomische Nachrichten* M. E. Bijl, of the Royal Belgian Observatory at Uccle, gives the results of 685 determinations of latitude made by him during the period 1898.4–1899.5. The table given shows the time of each observation and the corresponding latitudes as deduced from the star positions given in the Berliner Jahrbuch and Newcomb's catalogue respectively. There is a constantly positive value for the difference Newcomb-B.J. of something of the order of  $+0''.6$ . The resulting latitudes show a range of about  $0''.7$  with a maximum at 1888.6, a minimum at 1889.0, and a lower maximum at 1889.3–1889.4.

THE STANDARDISATION OF ROWLAND'S WAVE-LENGTHS.—In an article appearing in No. 1, vol. xx., of the *Astrophysical Journal*, Prof. Hartmann answers the criticisms which have been passed on the proposals of his previous article, wherein he strongly urged the standardisation of Rowland's wave-lengths to a uniform relative scale. It

has been urged that Michelson's absolute values should be used for the construction of an absolute scale, but Prof. Hartmann points out that the adoption of this idea would necessitate a wholesale revision each time a new estimate of the absolute wave-lengths was made.

In lieu of this he again suggests that the wave-length of the red line in the cadmium spark spectrum in air at  $+20^\circ$  C. and 760 mm. pressure be adopted as  $\lambda = 6438.6911$  for all time, and that a coordination of a system of relative wave-lengths should be made with this as the standard.

The most urgent need before such a system can be completed is that an observer having the control of a large grating spectrograph shall continue Kayser's work in establishing a system of standard iron lines in the region as yet untouched by that observer. This need supplied, the values obtained by Michelson, Hamy, Fabry and Perot for a number of metals would furnish the connecting links for the completion of the proposed system.

SATURN'S NINTH SATELLITE.—From a note by Prof. E. C. Pickering in No. 3962 of the *Astronomische Nachrichten*, it appears that the position angles and distances of the satellite Phoebe, which were recently published in a Kiel *Circular*, were obtained from an ephemeris corrected to agree with the positions determined from eleven photographs obtained by Prof. Frost at Arequipa. These allowed the path of the satellite to be followed from April 16 to June 9.

#### DISTRIBUTION OF SUCCESSES AND OF NATURAL ABILITY AMONG THE KINSFOLK OF FELLOWS OF THE ROYAL SOCIETY.

THE result of this inquiry is to prove the existence of a small number of more or less isolated hereditary centres, round which a large part of the total ability of the nation is clustered, with a closeness that rapidly diminishes as the distance of kinship from its centre increases.

The materials are derived from the replies to a circular which I sent with a blank schedule, to all fellows of the Royal Society, asking for the names and achievements of their "noteworthy" kinsfolk in each degree of near kinship as specified in the schedule. Notworthiness was defined as including any success that was, in the opinion of the sender, at least equal in its way to that in which the honour of a fellowship of the Royal Society is held by scientific men.

Returns are still dropping in, and now exceed two hundred. They continue to be very acceptable, but I judged it best to content myself with the number received up to a date when I could conveniently work at them, and to publish preliminary results without longer delay. The total number of returns received up to the date in question, that contained one or more noteworthy kinsfolk, was 110.

Subjoined are classified lists of the qualifications that were considered by one or other of the 110 correspondents as warrants of notworthiness. I attached to each of these more or less noteworthy kinsmen (for my own private use in this inquiry) a \*, a +, a -, or a o, signifying respectively 3, 2, 1, or no marks. In doing this, account was taken of honours, of biographical notices, and of the context of the communication, which often helped in deciding cases. Only one of these symbols was allotted to each individual.

A List.—Mostly recipients either of a \* or a +.

Ministers of State, Heads of Departments, Permanent Secretaries, and other high posts in public offices. Member of Parliament, but subject to reservation.

Foreign Ambassador or Minister, Consul General, Secretary of Legation.

Governor of a Colony, Colonial Secretary, high Colonial Office.

Admiral or General in important command, high Staff appointments.

Clerical dignitaries, eminent ministers, philanthropists.

Legal dignitaries at home and in the colonies.

Medical men of distinction.

Professors in great universities, heads of the more important colleges and schools.

University scholarships, first or second place in class lists of universities or in competitive examinations for Woolwich, Indian Civil, or principal home services.

Distinction in any form of Art—as poet, musician, singer; architect sculptor; painter, engraver, caricaturist; actor.

President or secretary of great institutions connected with science, literature, art, or purposes of public utility.

Authorship of a standard work, editorship of an important journal, authorship of valuable memoirs.

Inventor in any branch, scientific traveller.

Founder of a great business, management of great commercial undertakings, pioneer of a new industry.