

IN the first part of the *Bulletin* of the Imperial Society of Naturalists of Moscow, Mr. J. Gerassimow adds another paper to his contributions to the physiology of the cell. In cultures of *Spirogyra crassa* and allied species he obtained abnormal cells, without nuclei, or with excess of nuclear matter, or with two nuclei, by cooling the cultures in which the filaments were in an active stage of division. The result of changing the proportion of nuclear substance to cell contents was to cause irregularity of growth, so that where the nuclear substance was in excess, cell division was retarded, but general growth accelerated.

WE have received a copy of a pamphlet entitled the "Advantages of Ambidexterity," which may be obtained from Messrs. Sampson Low, Marston and Co., Ltd., price 6d. The booklet contains a lecture, delivered before the Ambidextral Culture Society by the honorary secretary, Mr. John Jackson, dealing with the "advantages accruing to any and every individual who may acquire the faculty of using both hands with equal facility."

AN unpretentious magazine has just appeared under the title of *Discovery*; and it merits encouragement because its aims are to publish trustworthy information on scientific and other topics. In the first number, Dr. J. Oldfield writes on diet, Dr. Edith Temple Orme on the modern education of women, Mr. A. A. Buss on spectroscopy, and Mr. A. C. D. Crommelin on the total solar eclipse of August 30, 1905. Other subjects of popular interest are dealt with in shorter contributions. The editor is Mr. G. McKenzie Knight, and the London agents Messrs. Bensberg Bros., 7 Electric Parade, Seven Sisters Road, N.

THE Cambridge Scientific Instrument Company has just issued a useful illustrated list under the title "Technical Thermometry." It is a new, revised, and enlarged edition of an earlier catalogue entitled "The Measurement of Temperature by Electrical Means." Copies of the list may be obtained on application to the company. Among the chief contents may be mentioned sections dealing with electrical resistance thermometers, thermoelectric thermometers, continuous temperature recorders, and electrical resistance furnaces. The excellent illustrations and full descriptions will render the list very serviceable to teachers and investigators.

OUR ASTRONOMICAL COLUMN.

THE LINE SPECTRUM OF COPPER.—Some exceedingly interesting results have been obtained by Mr. A. S. King at Bonn during a detailed study of the line spectrum of copper under many various conditions of arc and spark discharges. Mr. King suggests that an accurate knowledge of the conditions which produce spectral changes can only be obtained by the detailed study of each element under every possible condition of temperature, vapour pressure, and electrical excitation, and to this end he has commenced with the line spectrum of copper.

He found that on using a high voltage, but small current, in producing the arc spectrum, the "spark" lines were shown on his photographs, and he attributes this phenomenon to the frequent interruptions of the arc producing electrical conditions similar to those obtaining in the spark discharge. Again, in the spark, he photographed the spectrum of the green luminous vapour outside the direct path of the spark, and found that whilst the air spectrum was almost entirely eliminated, there were very few changes amongst the intensities of the copper lines. As this outer layer would have, presumably, the same electrical conditions as, but a lower temperature than, the spark track, he suggests that the experiment affords strong evidence that the electrical condition, rather than the vapour density or

the temperature, is the governing factor in producing the various types of spectra.

Mr. King gives a table of the lines which he has studied, showing the behaviour of each line under the different conditions, and he also describes the experimental methods and the results obtained when the temperature, pressure, &c., were varied (*Astrophysical Journal*, No. 1, vol. xx.).

EPHEMERIS FOR THE RETURN OF ENCKE'S COMET.—A further extract from the ephemeris for the approaching return of Encke's comet, published by MM. Kaminsky and Ocoultsch in No. 3962 of the *Astronomische Nachrichten*, is given below:—

*Ephemeris oh. (M.T. Berlin).*

1904	$\alpha$ (app.) h. m. s.	$\delta$ (app.)	log $r$	log $\Delta$
Sept. 8	1 49 33	+24 59	0.3183	0.1097
" 12	1 46 38	+25 34	0.3094	0.0828
" 16	1 43 6	+26 8	0.3002	0.0551
" 20	1 38 20	+26 41	0.2906	0.0266
" 24	1 32 21	+27 12	0.2806	9.9974
" 28	1 25 1	+27 40	0.2702	9.9677
Oct. 2	1 16 12	+28 3	0.2593	9.9377

According to the above, the comet should apparently be situated about half-way between  $\beta$  Arietis and  $\alpha$  Triangulum on September 18, and, travelling thence in a W.N.W. direction, it should arrive very near to  $\nu$  Piscium on October 2.

SUPPOSED RELATION BETWEEN SUN-SPOT MINIMA AND MAXIMA INTENSITIES.—From an analysis of Wolfer's relative numbers, M. Angot believes that he has discovered a connection between the intensity of a sun-spot minimum and the intensity of the succeeding maximum.

According to a table prepared by him, and published in No. 4 (1904) of the *Comptes rendus*, a minimum during which the number of spots is very small is followed by a maximum in which the spots are correspondingly few.

In accordance with this theory, the maximum now approaching should be a feeble one, the relative number for the spots not exceeding 70 or 80, because the relative number for the past minimum was very small, viz. about 3.0.

EPHEMERIS FOR COMET TEMPEL<sub>2</sub>.—A continuation of the ephemeris for Tempel's second comet during the approaching apparition, taken from the daily ephemeris published by M. Coniel in No. 3962 of the *Astronomische Nachrichten*, is given below:—

*Ephemeris 12h. (M.T. Paris).*

1904	$\alpha$ app. h. m. s.	$\delta$ app.	log. $\Delta$	$r : r^2 \Delta^2$
Sept. 7	15 7 9	-10 12	0.2361	0.142
" 11	15 16 36	-11 22	0.2380	0.143
" 15	15 26 26	-12 30	0.2398	0.145
" 19	15 36 39	-13 38	0.2416	0.147
" 23	15 47 15	-14 44	0.2433	0.149
" 27	15 58 14	-15 49	0.2450	0.151
Oct. 1	16 9 37	-16 53	0.2467	0.152
" 5	16 21 22	-17 53	0.2484	0.154

The comet is due at perihelion early in November. On September 9 it should apparently be between one and two degrees south of  $\beta$  Libræ, and on October 2 about one degree south of  $\phi$  Ophiuchi. As this comet is likely to be only a faint object during this apparition, it may be a difficult one for observers in this country.

DIRECTION OF THE SUN'S PROPER MOTION.—In No. 3961 of the *Astronomische Nachrichten* Prof. Kobold discusses the proper motions of 144 stars chiefly taken from the catalogues of Porter and Bradley.

From the discussion he deduces the position of the anti-apex of the Sun's-Way, and finds it to be a point near to  $\alpha$  Argus having as its coordinates

$$A = 159^\circ.6, D = -54^\circ.7.$$

As a general result, he states that the stars, of which the motions are perpendicular to the parallactic motion, are situated in preponderating numbers in a zone which passes through the apex and anti-apex, and runs perpendicular to the plane of the Milky Way, the point towards which they appear to be travelling being situated near to  $\alpha$  Argus.