

MESSRS. A. GALLENKAMP AND CO., makers of chemical apparatus, wish it to be known that, in the new premises to which they have just removed, they propose to exhibit in their show-room examples of new instruments described in scientific periodicals, and of apparatus kept in stock.

A BIOGRAPHY and an account of the botanical labours of the late Prof. Julius Sachs, by Prof. Goebel, appears in the pages of *Flora*; and one of the late Fritz Müller, by Prof. Ludwig, in the *Botanisches Centralblatt*. Each memoir is accompanied by a copious bibliography.

ANOTHER new botanical journal is announced from America, the first number to appear on October 1. It is to be named *The Plant World*, and will be an illustrated monthly journal of popular botany. "It will," says the *Botanical Gazette*, "present the facts of plant-life in simple popular language, and aim to interest those who have no inclination for a systematic course of study. The purpose is to be scientific, but not technical." The editor will be Dr. J. F. Knowlton, of the U.S. National Museum.

AMONG papers on physiological botany recently received from America are "The Curvature of Roots" by Mr. D. T. McDougal, and "The Rôle of Water in Growth" by Mr. C. B. Davenport. In the former the author points out that the curvatures of stems are not due to the same causes as those of tendrils or of many roots. The curvature of roots is due to the excessive elongation of the internal layers of the cortex of the side which becomes convex. The development and organisation of irritability in roots has been widely different from that in stems. The organs of the irritable mechanism of roots exhibit a physiological rather than a morphological differentiation.

THE additions to the Zoological Society's Gardens during the past week include a Badger (*Meles taxus*) from Worcestershire, presented by Mrs. Cheape; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mrs. B. Hudson; a Red and Yellow Macaw (*Ara chloroptera*) from South America, presented by Mr. J. W. Drysdale; a Peregrine Falcon (*Falco peregrinus*), British, presented by Major Hawkins Fisher; a Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*) from Moluccas, presented by Mr. John Paget; a Crowned Lemur (*Lemur coronatus*) from Madagascar, two Korin Gazelles (*Gazella rufifrons*, ♂ ♀) from Senegal, an Alexandrine Parrakeet (*Palaeornis alexandri*) from India, deposited; two Common Sandpipers (*Tringoides hypoleucus*), European, purchased.

OUR ASTRONOMICAL COLUMN.

BOND'S COLLECTED WORKS.—It is stated in *Science* that, at the request of the daughters of George Bond, Prof. Holden, Director of the Lick Observatory, has undertaken to arrange the manuscript material in their hands in an orderly form. The work will be entitled "Memorials of William Cranch Bond, Director of the Harvard College Observatory, 1840-59, and of his Son, George Phillips Bond, Director of the Harvard College Observatory, 1859-65," and will be published by Messrs. C. A. Murdock and Co., San Francisco, and by Messrs. Lemcke and Büchner, New York City. The book will be well illustrated. It is hoped, by the kindness of Prof. E. C. Pickering, to reproduce two fine steel engravings of the Great Comet of 1858 and of the nebula of Orion, from the plates of the *Annals* of the Harvard College Observatory.

ECLIPSE EXPEDITION OF THE LICK OBSERVATORY.—We learn from the Publications of the Astronomical Society of the Pacific, that the Lick Observatory expedition to observe the forthcoming solar eclipse will consist of Prof. Campbell and volunteer assistants. The expenses of the expedition will be met from a fund provided by the late Colonel C. F. Crocker.

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The programme will include spectroscopic and photographic work, and an equipment will be taken to obtain the following results, among others:—Photographs of the spectrum of the reversing layer; spectrum photographs having for their special object the determination of the velocity of rotation of the corona; photographs of the corona on a large scale (40 feet long), on the plan employed by Prof. Schaeberle in Chile; photographs of the corona with a portrait lens; photographic photometry of the corona.

A REMARKABLE BINARY STAR.—Recent observations leave practically no room for doubt that the close double star  $\beta$  883 = Lalande 9091 (R.A. = 4h. 44m. 33s., Decl. + 10° 52', Mags. 7.8 and 8), has the shortest period of any known binary. The star was discovered by Mr. Burnham in 1879, and Schiaparelli made a number of measures of it between 1887 and 1895, and upon combining these observations with other measures, Dr. T. J. J. See was forced to the conclusion that the period was only a few years. Further considerations give support to this view, and now Dr. See (*Monthly Notices*, R.A.S., June 1897), from a discussion of the whole of the facts of observation, concludes that the period is only 5.5 years.

The elements of the orbit are given as follows:—

$$\begin{aligned} P &= 5.5 \text{ years} & a &= 0''.621 \\ T &= 1896.40 & \Omega &= 20^\circ.6 \\ \epsilon &= 0.760 & i &= 82^\circ.52 \\ & & \lambda &= 273^\circ.83 \end{aligned}$$

Apparent orbit:—

$$\begin{aligned} \text{Length of major axis} &= 0''.67 \\ \text{Length of minor axis} &= 0''.16 \\ \text{Angle of major axis} &= 19^\circ.5 \\ \text{Angle of periastron} &= 318^\circ.0 \\ \text{Distance of star from centre} &= 0''.07 \end{aligned}$$

Referring to this remarkable object, Dr. See says:—

"The discovery of an object revolving in a period of 5.5 years is an achievement of some philosophic significance in the history of double-star astronomy. In the time of Sir John Herschel the most rapid of known binaries was  $\zeta$  Herculis, with a period of 35 years. Twenty years ago the remarkable object 42 Comae Berenices had reduced the shortest period to about 25 years, and in 1887  $\delta$  Equulei brought it down to 11.5 years.  $\kappa$  Pegasi ( $\beta$  989) has since been shown to revolve in a similar period.

In  $\beta$  883 we have for the first time a visible binary with a period fairly approaching those of the spectroscopic binaries recently discovered, and we seem assured that at last a link has been found connecting the two classes of objects. It is probable that other stars will disclose even shorter periods, for there is no reason why there should not be close doubles with periods of a single year or less. It will be an interesting object of future research to fill in the intervening steps between visible binaries with periods of a few years and the spectroscopic binaries revolving in a few days or months.

"The more critical inquiry into the motion of close doubles will commend itself to the attention of double-star observers with great telescopes, and, on the other hand, it may be hoped that the study of the relative motion in line of sight of the components of binaries like  $\beta$  883 will be taken up by some of our great observatories equipped with powerful spectroscopic appliances."

FORTHCOMING BOOKS OF SCIENCE.

MR. EDWARD ARNOLD'S list contains:—"Higher Algebra," by Dr. R. Lachlan; "The Elements of Trigonometry," by Dr. R. Lachlan; "Analytical Geometry," by Dr. R. Lachlan; "The Elements of Euclid," Books III., IV. and VI., by Dr. R. Lachlan; "Dynamics for Engineering Students," by Prof. W. E. Dalby; "Elementary Natural Philosophy," by Alfred Earl; "An Elementary Chemistry," by W. A. Shentstone; "Physical Chemistry," by Dr. Alexander Scott; "Practical Chemistry," by Dr. E. H. Cook; "A Manual of Physiology," by Dr. Leonard Hill; "A Manual of Botany," by David Houston; Arnold's Practical Science Manuals: "Steam Boilers," by George Halliday; "Agricultural Chemistry," by T. S. Dymond; "Electric Traction," by Ernest Wilson; "Lectures on Sound, Light, and Heat," by Dr. Richard Wormell, new edition.

Messrs. Baillièrè, Tindall, and Cox's forthcoming books in-