OUR ASTRONOMICAL COLUMN.

RELATIVITY AND GRAVITATION.—A pamphlet has just reached us entitled "La spostamento del perielio di mercurio, e la deviazione dei raggi luminosi, secondo la teoria di Einstein," by Attilio Palatini (from *Nuovo Cimento*, July, 1917; Pisa: Stabilimento Tipografico Toscano). The pamphlet, like the article by Prof. Eddington in NATURE of December 28, 1916 (vol. xcviii., p. 328), aims at making the outlines of Einstein's relativity theory clear to those who have not access to his original works. The points in which the new theory differs from our earlier conceptions of Euclidean space and Newtonian dynamics are clearly brought out. As the title indicates, particular stress is laid upon the manner in which it completely accounts for the excess of 43″ per century in the motion of the perihelion of Mercury's orbit, which had been recognised as a difficulty in the Newtonian theory. It is especially noteworthy that the Einstein theory was laid down quite independently of this result, which is therefore in the nature of an undesigned coincidence. It differs in this respect from some other relativity theories, which have assumed arbitrary values for certain coefficients, in order to satisfy the observed facts. Einstein's result involves no arbitrary constant, but simply depends on the ratio of Mercury's velocity to that of light. The pamphlet employs two different methods of development, each leading to the result that the perihelion advances 0·1″ in one revolution of Mercury.

The other test proposed by Einstein for his theory is that a ray of light from a star just grazing the sun's surface and passing on to the earth would be deflected through an angle of 1·75″. It is shown in the pamphlet how this result is deducible from Einstein's principles, and allusion is made to total solar eclipses as affording opportunities for a practical test. The Astronomer Royal has already urged that advantage be taken of the very favourable total eclipse of May, 1919, for experiments of this kind. Prof. Eddington has pointed out that the doctrine that light has inertia would lead us to expect a deflection of 0·88″ at the sun's limb in any case; so the Einstein test depends on the difference between this value and 1·75″.

THE SYSTEM OF κ PEGASI.—The star κ Pegasi is a visual binary having the unusually short period of 11·35 years, and one of the components, as found by Campbell in 1900, is a spectroscopic binary. An investigation of this interesting triple system has been made by Dr. F. Henroteau, utilising spectrograms previously taken at the Lick Observatory, and numerous others recently obtained by himself (Lick Observatory Bulletin, No. 304). Elements of the orbit of the spectroscopic pair, computed for the epochs 1900, 1912, and 1917, clearly show the changes to be expected from the revolution round the centre of mass of the visual system, and they also indicate a revolution of the line of apsides, probably due to perturbations occurring in the spectroscopic binary orbit under the influence of the third body. Combining the data obtained by telescopic and spectroscopic observations, it is shown that the semi-major axis of the orbit of the spectroscopic binary is 511,100,000 km., while that of the visual pair is 1,826,000,000 km. Since the apparent semi-major axis is 0·29″, it follows that the parallax is 0·025″. The total mass of the spectroscopic pair is 10·33 times, and the mass of the other visual component 4·00 times, that of the sun. There are curious variations in the appearance of the spectrum, which seem to be satisfactorily explained by the superposition of an F class spectrum, oscillating in a period of 5·9715 days, upon a spectrum of possibly the same class oscillating by a smaller amount in a period of 11·35 years.

FORTHCOMING BOOKS OF SCIENCE.

AGRICULTURE AND HORTICULTURE.

Baillière, Tindall, and Cox.—A new edition of Cows, Cowhouses, and Milk, G. Mayall.

ANTHROPOLOGY AND ARCHÆOLOGY.

Macmillan and Co., Ltd.—Folk-Lore in the Old Testament, Sir J. G. Frazer, three vols.

BIOLOGY.

Constable and Co., Ltd.—Coniferous Trees, A. D. Webster, illustrated. *C. H. Kelly.*—Spiders and Beetles, and How to Identify Them, S. N. Sedgwick. *John Murray.*—The Life and Letters of Sir Joseph Dalton Hooker, O.M., G.C.S.I., L. Huxley, based on material collected and arranged by Lady Hooker, two vols., illustrated. *L. Reeve and Co., Ltd.*—Flora of Tropical Africa, edited by Sir D. Prain, vol. vi., section 2, part 2, dealing with the orders Ulmaceæ to Cycadaceæ; vol. ix. (Gramineæ), part 2. *The University Tutorial Press, Ltd.*—Text-Book of Botany, J. M. Lowson, Indian edition, revised by Birbal Sahni.

CHEMISTRY.

G. Allen and Unwin, Ltd.—The Treasures of Coal Tar, Prof. A. Findlay. *Baillière, Tindall, and Cox.*—Plant Products and Chemical Fertilisers, S. H. Collins, and a new edition of Aids to Analysis of Foods and Drugs, C. G. Moor and W. Partridge. *Blackie and Son, Ltd.*—A Complete Course of Volumetric Analysis for Middle and Higher Forms of Schools, William T. Boone. *J. and A. Churchill.*—Applied Analytical Chemistry, edited by Prof. V. Villavecchia, translated by T. H. Pope, vol. ii.; Chemical Combination among Metals, Drs. M. Guia and C. Guia-Lollini, translated by G. W. Robinson. *Constable and Co.*—What Industry Owes to Chemical Science, R. B. Pilcher and F. Butler-Jones, with an introduction by Sir G. Beilby ("The Engineer" Series), and a new edition of Laboratory Guide of Industrial Chemistry, A. Rogers, illustrated. *Crosby Lockwood and Son.*—High Explosives: their History, Manufacture, Properties, and Uses, Lieut. E. de W. S. Colver, illustrated. *Longmans and Co.*—Lecithin and Allied Substances: The Lepins, Dr. H. Maclean (Monographs on Biochemistry). *Macmillan and Co., Ltd.*—Sir William Ramsay, K.C.B., F.R.S.: Memorials of His Life and Work, Sir W. A. Tilden, with portraits; The Manufacture of Intermediate Products for Dyes, Dr. J. C. Cain, illustrated. *Scott, Greenwood, and Son.*—New editions of The Chemistry of Essential Oils, E. J. Parry, two vols., and Iron Corrosion, Anti-Fouling and Anti-Corrosive Paints, L. E. Andes. *The University Tutorial Press, Ltd.*—Senior Practical Chemistry, H. W. Bausor.

ENGINEERING.

Benn Bros., Ltd.—Electrical Measuring Instruments: their Design, Construction, and Application, Dr. C. V. Drysdale and A. C. Jolley; The Handling of Materials: A Manual on the Design, Construction, and Application of Cranes, Conveyors, Hoists, and Elevators (being the second and enlarged edition of "Electric Cranes and Hoists"), H. H. Broughton, two vols., illustrated; The Induction Coil, Prof. E. Taylor Jones; Manual of the Telephone, W. Aitken, two vols.; and a new edition of Electric Mains and Distributing Systems, J. R. Dick and F. Fernie. *Blackie and Son, Ltd.*—Tidal Lands: A Study of Shore Problems, A. E. Carey and Prof. F. W. Oliver, illustrated. *Constable and Co., Ltd.*—The Pro-