

Industrial Colloidal Chemistry, by Prof. E. B. Spear, and a chapter on Colloidal Chemistry and Sanitation by Prof. J. F. Norton; "An Introduction to Theoretical and Applied Colloid Chemistry," by Dr. W. Ostwald, translated by Prof. M. H. Fischer; "Biochemical Catalysts in Life and Industry: Proteolytic Enzymes," by Prof. J. Effront, translated by Prof. S. C. Prescott and C. S. Venable; "Practical Pyrometry," by E. S. Ferry, G. A. Shook, and J. R. Collins; "Hand Grenades," by Major G. M. Ainslie; "Ordnance and Gunnery," by Lt.-Col. W. H. Tschappat; "Hydro-Electric Power-Stations," by E. A. Lof and D. B. Rushmore; "A Practice Book in Elementary Metallurgy," by Prof. E. E. Thum; "Testing for the Flotation Process," by A. W. Fahrenwald; an enlarged edition of "Practical Instructions in the Search for, and the Determination of, the Useful Minerals, including the Rare Ores," by A. McLeod; "The Development of Forest Law in America," by J. P. Kinney; and reprints of "Scientific and Applied Pharmacognosy," by Prof. H. Kraemer, and "Applied and Economic Botany," by Prof. H. Kraemer.

OUR ASTRONOMICAL COLUMN.

THE PLANET SATURN.—This beautiful telescopic object will be in opposition to the sun on January 31, and will be very favourably placed for telescopic scrutiny during the ensuing few months. There is evidence to show that much the same phenomena occur on Saturn as on Jupiter, and that occasionally disturbances on a considerable scale occur in the atmosphere of the former object. Yet it has not been very successfully observed when we compare the results with those obtained with regard to Mars and Jupiter. The far greater distance of Saturn and the less conspicuous character of the markings are no doubt in part responsible for this, but sometimes, as in 1903, the spots and irregularities in the belts are very plain and numerous.

The rotation period of Saturn requires redetermination, for the markings in different latitudes exhibit proper motions. Prof. Hall's white equatorial spot of 1876-77 gave a period of 10h. 14m., whereas the dark and light markings which were visible in the north temperate region in 1903 indicated a period of about 10h. 38m., or twenty-four minutes longer.

UNIT OF STELLAR DISTANCE.—As a step towards the extension of the decimal system to celestial measurements, and the unification of units in the statement of stellar distances, it is suggested by M. de Rey Pailhade that a convenient unit would be 10^{10} kilometres (*L'Astronomie*, December, 1917). A light-year is equivalent to 946 of such units, or approximately 1000, which is a number easily remembered. The parsec, which corresponds to 3.25 light-years, is very closely 3000 units, and the distance of 61 Cygni would be expressed by 5865. On the same system, the mean distance of the earth from the sun is 0.015, and that of Neptune 0.450. The symbol suggested for the new unit is *Us* (*unité stellaire*), but this does not seem to be well adapted for countries other than France.

RELATIVITY AND SHIFTS OF FRAUNHOFER LINES.—According to Einstein's theory of relativity, the lines in solar and stellar spectra should be displaced towards the red by an amount depending upon the difference in gravitational potential between the gravitational field in which the lines originate and the terrestrial field where the radiation is received. In the case of the sun the theoretical displacement is equivalent to the Doppler displacement due to a radial velocity of 0.634 km. per sec., and at 15000 amounts to 0.010 Å. With the powerful instruments now in use in solar observations

such a shift of the lines should be easily measurable. The question has been taken up at Mt. Wilson by Dr. St. John, who has selected some of the band lines of cyanogen as the most suitable for the purpose, in consequence of their freedom from displacements due to pressure (*Astrophysical Journal*, vol. xlvii., p. 249). The mean sun *minus* arc displacement at the centre of the sun for the forty-three band lines measured was zero, while for thirty-five lines at the limb it was only +0.0018 Å. It cannot be assumed, therefore, that the Einstein effect is annulled at the centre by an outward radial motion of the solar vapours, as the effect of such a motion would vanish at the limb and the gravitational effect should appear. The observations accordingly give no evidence of a displacement of the lines of the order of magnitude required by the principle of relativity.

THE "ANNUAIRE ASTRONOMIQUE" FOR 1918.—The current issue of this useful publication maintains the high standard reached in former years. Besides the usual tables relating to the sun, moon, and planets, it includes a series of charts showing the aspect of the heavens in each month, and interesting notes on a great variety of astronomical subjects. A general review of progress in the various departments of astronomy and meteorology is a valuable feature. The *Annuaire* is published at 3 francs by the Librairie Ernest Flammarion, Paris.

PARIS ACADEMY OF SCIENCES.

PRIZES PROPOSED FOR THE YEAR 1919.

Mathematics.—Franceur prize (1000 francs), for discoveries or works useful to the progress of pure or applied mathematics.

Mechanics.—Montyon prize (700 francs), for the invention or improvement of instruments useful to the progress of agriculture, the mechanical arts, and the practical and speculative sciences; Poncet prize (2000 francs), for work useful to the progress of mechanics.

Astronomy.—The Lalande prize (540 francs), for the most interesting observation in, or memoir most useful to the progress of, astronomy; Benjamin Valz prize (460 francs), for work on astronomy under similar conditions to those of the Lalande prize; G. de Pontécoulant prize (700 francs), for the encouragement of work in celestial mechanics.

Geography.—Gay prize (1500 francs). The question proposed for 1919 is the study of the physical geography of North Africa, and principally Mauritania; Tchihatchef foundation (3000 francs), for recompense or assistance to naturalists distinguished in the exploration of the lesser-known parts of Asia, excluding British India, Siberia, Asia Minor, and Syria.

Navigation.—The prize of 6000 francs, for work increasing the efficiency of the French naval forces; Plumey prize (4000 francs), for improvements in steam engines or any other invention contributing to the progress of steam navigation.

Physics.—Kastner-Boursault prize (2000 francs), for the best work on the various applications of electricity in the arts, industry, and commerce; Gaston Planté prize (3000 francs), to the author of a discovery, invention, or work important in the field of electricity; Hébert prize (1000 francs), for the best treatise or most useful discovery for the popularisation and practical use of electricity; Henri de Parville prize (1500 francs), for original work in physics; Hughes prize (2500 francs), for an original discovery in the physical sciences, especially electricity and magnetism and their applications; Pierson-Perrin prize (5000 francs), for a discovery in physics.

Chemistry.—Montyon prize (unhealthy trades) (one