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 λ 5000 amounts to 0·010 A. 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. xlvi., 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 A. 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.—Francœur 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; Poncelet 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

prize of 2500 francs and one mention of 1500 francs), for the discovery of a means of rendering some mechanical art less unhealthy; Jecker prize (10,000 francs), for the author of the work most useful to organic chemistry; Cahours prize (3000 francs), for the encouragement of young men already known to have done good work, more particularly by researches in chemistry; Houzeau prize (700 francs), for a young chemist of merit.

Mineralogy and Geology.—Delesse prize (1400 francs), for work in geology, or, alternatively, in mineralogy. It may be divided. Joseph Labbé prize (1000 francs), for geological work or researches with reference to the mineral wealth of France, its colonies or protectorates, or, in default, to recompense the author of any work made in the general interest.

Botany.—Desmazières prize (1600 francs), for the best work on cryptogams published during the preceding year; Montagne prize (1500 francs), to the author or authors of important discoveries or works on the cellular plants; Jean Thore prize (200 francs), for the best memoir on the fluviatile or marine algæ of Europe, or on mosses, lichens, or European fungi; de la Fons Mélicocq prize (900 francs), for the best work on the botany of the North of France; de Coincy prize (900 francs), for a work on phanerogams; Jean de Rufz de Lavison prize (500 francs), for work in plant physiology.

Anatomy and Zoology.—Cuvier prize (1500 francs), for work in anatomy and zoology; Savigny foundation (1500 francs), for the assistance of young travelling zoologists, not receiving a Government grant, who specially occupy themselves with the invertebrates of Egypt and Syria.

Medicine and Surgery.—Montyon prize (three prizes of 2500 francs, three honourable mentions of 1500 francs, citations), for discoveries or improvements during the year in medicine or surgery; Barbier prize (2000 francs), for a discovery valuable in surgery, medicine, pharmacy, or in botany having a relation to the art of healing; Bréant prize (100,000 francs), the capital sum is offered to anyone discovering a specific cure for Asiatic cholera or for the discovery of the causes of this terrible scourge; Godard prize (1000 francs), for the best memoir on the anatomy, physiology, and pathology of the urino-genitary organs; Chaussier prize (10,000 francs), for the best book or memoir showing an advance in legal or practical medicine; Mège prize (10,000 francs), to the author who continues or completes the essay of Dr. Mège on the causes which have retarded or favoured the progress of medicine from antiquity to the present day; Bellion prize (1400 francs), for works or discoveries especially profitable to the health of man or the amelioration of the human species; Baron Larrey prize (750 francs), to a doctor or surgeon belonging to the Army or Navy for the best work presented to the Academy in the course of the year dealing with military hygiene, surgery, or medicine; Argut prize (1200 francs), for a discovery allowing the cure, by medicine, of a disease up to the present only capable of being dealt with surgically.

Physiology.—Montyon prize (750 francs), for the most useful work in experimental physiology; Lallemand prize (1800 francs), for work relating to the nervous system in the fullest sense of these words; Philipeaux prize (900 francs), for experimental physiology; Fanny Emden prize (3000 francs), for the best work treating of hypnotism, suggestion, and generally of physiological action exerted at a distance from the animal organism.

Statistics.—Montyon prize (one prize of 1000 francs, two mentions of 500 francs), for statistical researches of any nature.

History and Philosophy of the Sciences.—Binoux prize (2000 francs).

Medals.—Arago medal, awarded by the Academy at any time that a discovery, work, or service rendered to science appears worthy of this testimony of high esteem; Lavoisier medal, awarded under conditions applying to the Arago medal, for services rendered to chemistry; Berthelot medal, to holders each year of the prizes in chemistry.

General Prizes.—Prize founded by the State (3000 francs), question for 1919: researches on the geographical and bathymetric migrations of fishes and on the conditions which govern them; Bordin prize (3000 francs), question for 1919: in the theory of integrals of total differentials of the third species and double integrals relating to an algebraic function of two independent variables, the existence of certain numbers (*nombres entiers*) has been demonstrated, of which it is difficult to obtain the value, and may depend on the arithmetical nature of the coefficients of the equation of the surface corresponding with the function. The Academy requires a profound study of these numbers in particular cases. Vaillant prize (4000 francs), question for 1919: to discover a photographic layer, without visible grain, and as sensitive as the gelatino-bromide at present in use; Petit D'Ormoy prize: two prizes of 10,000 francs each, one for pure or applied mathematics, the other for natural science; Jean Jacques Berger prize (15,000 francs), for work relating to the city of Paris; Saintour prize (3000 francs), for work in the mathematical sciences; Henri de Parville prize (1500 francs), for a book on original science, or popularisation of science; Lonchampt prize (4000 francs), for the author of the best memoir on the diseases of man, animals, or plants from the special point of view of the introduction of mineral substances in excess as the cause of the disease; Henry Wilde prize (one of 4000 francs, or two of 2000 francs), for a discovery or work on astronomy, physics, chemistry, mineralogy, geology, or experimental mechanics; Gustave Roux prize (1000 francs); Thorlet prize (1600 francs).

Special Foundations.—The Lannelongue foundation (2000 francs), for one or two persons at most, in reduced circumstances, belonging themselves, or by their marriage, or parents, to the scientific world, with preference to medicine. Laplace prize, for the pupil leaving the Ecole Polytechnique holding the first place. L. E. Rivot prize (2500 francs), divided between the four pupils leaving the Ecole Polytechnique each year with the first and second places in the divisions of *mines* and *ponts et chaussées*. Normal School prize (2000 francs) will be awarded after the conclusion of the war to an old pupil, killed or wounded in the field, in recompense or in view of scientific work.

Funds for Scientific Research.—Trémont foundation (1000 francs); Gegner foundation (4000 francs); Jérome Ponti foundation (3500 francs); Henri Becquerel foundation (3000 francs); Bonaparte foundation (50,000 francs); Loutreuil foundation (125,000 francs); Charles Bouchard foundation (5000 francs).

GLASS TECHNOLOGY.

WE have now before us Nos. 1 to 3 of the Journal of the Society of Glass Technology. The first of these has already been noticed in these columns (NATURE, July 26, 1917). The two additional numbers now available indicate the healthy progress of this new society, and augur well for the renewed vitality of the glass industry in this country. The papers which appear in this journal cover a wide range of subjects and vary very considerably in size and