

## Prize Awards of the Paris Academy of Sciences.

AT the annual meeting of the Paris Academy of Sciences, the prizes and grants awarded for the year 1931 were announced as follows:

*Mathematics.*—The Francœur prize to Jacques Herbrand, for his work on the theory of bodies of numbers.

*Mechanics.*—The Montyon prize to Hippolyte Parodi, for his work on the electrification of railways and on ballistics; the Poncelet prize to Henri Chipart, for his work in mathematical physics and mechanics.

*Astronomy.*—The Lalande prize to Irénée Lagarde, for work relating to astronomical calculations; the Valz prize to Henri Chrétien, for his work in astronomical optics; the G. de Pontécoulant prize to Jean Chazy, for his work in analytical and celestial mechanics.

*Geography.*—The Gay prize to Henri Roussilhe, for his work on the use of aerial photography in topographical surveys on the large scale; the Tehihatchef prize to Charles Crevost and Alfred Pételot, the two authors of vol. 5 of the catalogue of the products of Indo-China (medicinal products); the Alexandre Givry prize to André Gougenheim, for his work in hydrography.

*Navigation.*—The Prix de la Marine between Eugène Burlot (3000 francs), for his theoretical and experimental studies on explosives, Charles Bertin (1500 francs), for his method of marine and aerial navigation, and Gabriel Voitureux (1500 francs), for his book on trans-Atlantic aerial navigation; the Plumey prize to Marcel Edmond Gautier, for his memoirs dealing with combustibles used in Diesel motors.

*Physics.*—The Kastner-Boursault prize to Francis Perrin, for his work on fluorescence; the Gaston Planté prize to Émile Pierret, for his researches on high frequency electromagnetic waves; the Hébert prize to Gustave Ribaud, for his treatise on pyrometry; the Henri de Parville prize to Georges Darrieus, for the whole of his work in electrotechnics, especially the calculations on high tension lines; the Hughes prize to René de Malleman, for his work on magnetic rotatory polarisation; the Pierson-Perrin prize to Georges Reboul, for the whole of his researches on the properties of semi-conducting substances; the Clement Félix foundation to Mlle. Madeleine Chenot, for the continuation of her researches on the high frequency discharge in rarefied gases.

*Chemistry.*—The Montyon prize (unhealthy trades) to Léon Brunel, for his contributions to various important problems of public hygiene, and an honourable mention (1500 francs) to Georges Champetier, for his work on the protection of civil populations against mustard gas; the Jecker prize to Ernest Fourneau, for the whole of his work in organic chemistry; the Cahours foundation between Arthur Brunel, for his work on plant ferments, and Jean Dœuvre, for his studies on citronellol and rhodinol; the Houzeau prize to Henri Marcelet, for his work as a whole.

*Mineralogy and Geology.*—The Delesse prize to Léon Carez, for his geological work on the Pyrenees; the Victor Raulin prize to Eugène Raguin, for his geological work in the Alps and the Central Massif; the Joseph Labbé prize to Lucien Thiébaud, for his work on the clay-limestone sediments of the Paris basin.

*Botany.*—The Desmazières prize to Gaston Ollivier, for his work "Étude de la flore marine de la Côte d'Azur"; the Montagne prize to Pierre Frémy, for his memoir on the Myxophyceæ of French Equatorial Africa; the Jean Thore prize to Georges Defandre, for his monographs on *Trachelomonas* and *Arcella*; the Fons Mélicocq prize to Jean des Cilleuls, for his work

on the plankton of the Loire: the de Coigny prize to Adolphe Prunet, for his work on the diseases of the chestnut tree; the Jean Rufz de Lavison prize to Émile Michel-Durand, for his memoirs on the variation of the carbohydrate substances in leaves and on the tannic compounds.

*Anatomy and Zoology.*—The Cuvier prize to François X. Lesbre, for the whole of his work on comparative anatomy, morphology, and teratology of mammals; the Savigny foundation to Robert Dollfus, for his work in the Red Sea and Suez Canal.

*Medicine and Surgery.*—The Montyon prizes. A Montyon gold medal to Edoardo Perroncito, for the whole of his scientific work. Prizes of 2500 francs to Maurice Auvray, for his memoir on diseases of the skull and brain; to Henri Chabanier and Carlos Lobo-Onell, for their memoir on functional exploration of the kidneys; to Maurice Villaret, François Saint-Girons, and Louis Justin-Besançon for their memoir on the physiological, clinical, and therapeutic study of peripheral venous pressure.

Honourable mentions (1500 francs) to Émile Césari, for his researches on the antigenic function of the lipoids; Paul Génaud, for his researches on the exchanges of ions between yeast cells and saline solutions; Mme. Mélina Lipinska, for her memoir on women and the progress of medical science.

The Barbier prize to Casimir Peirier, for his contribution to the study of the oil-bearing plants of the Cameroons; the Breant prize between (2500 francs each) Maurice Langeron, for his studies on the pathogenic fungi, and Pierre J. Teissier and Florent Coste, for their book on the physio-pathology of scarlet fever; the Godard prize between (500 francs each) Louis Berger, for his memoir on the internal secretion cells in the sexual glands in man and woman, and Fritz Busser, for his book on epithelial tumours of the kidney in the adult; the Chaussier prize to Victor Morax, for the whole of his medical work; the Mége prize to Jean Gautrelet, for his work on the influence of adrenalin on the variations of the alkaline reserve; the Bellion prize to Raoul Lecoq, for his book on food and life; the Larry prize to Maurice Pilod, for his studies on tuberculosis, Louis Izard and Jean des Cilleuls receiving an honourable mention for their book on military hygiene; the Argut prize to Pierre Ernest Roucaÿrol, for his memoir on direct 'd'arsonvalisation' in the treatment of blennorrhagia.

*Physiology.*—The Montyon prize to Charles Dhéré, for his studies on biological fluorescence; the Pourat prize (in equal parts) between Maurice Fontaine, for his experimental researches on the reaction of living beings to high pressures, and Fernand Obaton, for his memoir on the evolution of mannitol in plants; the Philipeaux prize to Robert Bonnet, for his work on metabolism.

*Statistics.*—Montyon prizes (1000 francs) to Pierre Caloni, for his memoir on the statistics of accidents and organisation for their prevention, and to Jean Fischer, for his statistical studies of the rivers Adour, Garonne, and Gironde.

*History and Philosophy of Science.*—The Binoux prize to Louis de Nussac, for his book on "Pierre Andre Latreille".

*Works of Science.*—The Henri de Parville prize between Émile Guyénot (2500 francs), for his books on variation, evolution, and heredity, and Paul Dorveaux, for his researches on the members and correspondents of the Royal Academy of Sciences, 1666-1793.

*Medals.*—The Berthelot medal was awarded to Henri Marcelet.

*General Prizes.*—The Grand prize (physical sciences) to Paul Fallot, for his geological work in the Balearic Islands, Andalusia, and Morocco; the Bordin prize to René Garnier, for his work on the problem of Plateau; the Lallemand prize to Albert Chauchard and Mme. Berthe Chauchard, for their physiological researches on the sympathetic and parasympathetic nervous system and on the brain; the Maujean prize to Gustave Bouffard, for his work on tropical diseases; the Petit d'Ormy Prize (mathematical sciences) to Gaston Julia, for the whole of his mathematical work; the Petit d'Ormy prize (natural sciences) to Pierre Lesne, for his entomological work; the Jean Reynaud prize to the late Paul Appell, for the whole of his scientific work; the Baron de Joest prize to Gustave Hinard, for his work on sanitation and oyster culture; the Parkin prize to Marius Dalloni, for his work in connexion with the expedition to Tibesti; the Saintour prize to Henri Devaux, for his work on the properties of thin layers deposited on the surface of liquids; the Lonchampt prize to Eugène Derrien, for his work in biochemistry; the Henry Wilde prize to Edmond Rothé, for his geophysical work; the Gustave Roux prize to Henri Bésairie, for his work on the geology of Madagascar; the Thorlet prize to Adolphe Richard.

*Special Foundations.*—The Lannelongue foundation to Mmes. Cusco and Rück; the Hélène Helbronner-Fould prize to Mme. Marc Bel, in recognition of the exploratory work done by her late husband.

*Prizes of the Grands Écoles.*—The Laplace prize to Jean Latourte; the L. E. Rivot prize between Jean Latourte, Albert Gabriel Bureau, Jean Gaston Chauchoy, and Alphonse Desiré Charles Louis Cachera.

*Foundations for Scientific Research.*—The Trément foundation to Maurice Lebrun, for his work on electric welding; the Gegner foundation to Eugène Estanave, for his work on photography; the Hirn foundation to Yves Milon, for geological and palæontological work in Brittany; the Henri Becquerel foundation to Edgar Pierre Tawil, for his work in piezo-electricity.

#### THE LOUTREUIL FOUNDATION.

The Academy has made the following grants from this fund:

1. *Researches on Definite Problems.*—Julien Costantin (3000 francs), for researches on applied botany in the Alps; Gabriel Marotel (2000 francs), for experimental researches on the disease of the fluke worm and its treatment; A. Aron (2000 francs), for prosecuting researches on the properties of thin metallic plates; James Basset (500 francs), for laboratory researches on the influence of high pressures on physical and chemical phenomena; Claude Gautier (1000 francs), for

work on the physiological synthesis of the proteins; Charles Marie (3000 francs), for researches on the ammonia-oxygen gas battery; Raymond Ricard (2000 francs), for spark spectra of metals by means of electrodeless discharges; Gaston Delépine (10,000 francs), for the continuation of work commenced by him and by his pupils, especially on the Carboniferous of Asturia; Abel Gruvel (2000 francs), as a contribution to his scientific and applied researches on the fauna of the hydrographic network of Syria.

2. *Purchase of Material.*—Emilio Damour (2000 francs), for the purchase of an apparatus controlling combustion by thermal conductivity; René Dubrisay (5000 francs), for the purchase of a microscope; Augustin Mesnager (2000 francs), to contribute to the purchase of an apparatus for measuring the distribution of the stresses in various elastic solids; Casimir Monteil (5000 francs), for the purchase of a Jacquet tachygraph.

3. *Libraries.*—École polytechnique (10,000 francs), for the library; École nationale vétérinaire d'Alfort (10,000 francs), for its library; École nationale vétérinaire de Lyon (13,000 francs), for assisting the replacement of the library destroyed by fire; École nationale vétérinaire de Toulouse, for its library.

4. *Publications.*—"Faune des Colonies françaises" (5000 francs), for its publications; Albert Peyrot (6000 francs), for the completion of the "Conchologie néogénique de l'Aquitaine"; Section of Terrestrial Magnetism and Atmospheric Electricity of the National Committee of Geodesy and Geophysics (6000 francs), for the publication of charts of magnetic anomalies in France; Georges Perrier (10,000 francs), for the calculations contained in the publication dealing with latitudes by meridional observations of the Mission de l'Équateur; Ministry for the Colonies, Service central de la Météorologie coloniale (15,000 francs), for starting a publication on the scientific observations made in the French overseas dominions; Office international de Documentation et de Corrélation pour la Protection de la Nature (2000 francs), for the publication of leaflets concerning the French colonies; Mme. Victor Noury foundation, between Paul Vignon (3000 francs), for his introduction to experimental biology; Raymond Decary (2500 francs), for his work entitled "L'Androy"; the late Gabriel Grimaud (2500 francs), for his book on the Rohan-Chabot expedition, and Jehan Albert Vellard (2500 francs), for his studies of the poisonous spiders of southern Brazil; the Charles Bouchard foundation to Serge Metalnikov, for his memoir on the rôle of the conditional reflexes and of the nervous system in immunity; the Roy Vaucouloux foundation to Antoine Lacassagne, for his work on the action of radiations on healthy and cancerous tissues.

### Measuring Atmospheric Pollution.

AT the present time, the investigation of atmospheric pollution—conducted in Great Britain by the Department of Scientific and Industrial Research through the agency of a Research Committee—is mainly carried out with the aid of three instruments, all designed by Dr. J. S. Owens, Superintendent of Observations to the Committee. The first, known as the deposit gauge, is designed for the purpose of measuring the total amount of impurity deposited on a given area. It consists essentially of a rain-gauge, in which the ordinary copper collecting funnel is replaced by a large glass receiver. The rain, with the impurity, is collected for a definite period, usually a calendar month, and then analysed. The second and third instruments are respectively the automatic air filter and the jet dust counter. The former gives a semi-con-

tinuous record of the concentration of suspended impurity in the atmosphere. The latter provides a means of determining the number of solid particles in a given volume of air and of ascertaining the physical nature of the individual particles. Dr. Owens has recently made important improvements to both these instruments, and, although no new principles are involved, their range of usefulness has been very greatly extended.

In the automatic air filter a known volume of air (actually two litres in standard instruments) is drawn at intervals into the apparatus through a nozzle,  $\frac{1}{8}$  in. in diameter, over which is pressed a piece of white blotting paper. In passing through the blotting paper the suspended impurity is filtered out and a darkened spot, varying in shade according to the concentration