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'Ormoy Prize (mathematical sciences) to Gaston Julia, for the whole of his mathematical work; the Petit d'Ormoy 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-continuous 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

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of the impurity, is left on the blotting paper. From the results of a long series of preliminary experiments with large volumes of air, it has been possible to construct a scale of shades each representing a definite number of milligrams of impurity per cubic centimetre. The reading of the record thus consists in matching the spot against a corresponding shade in a numbered scale, an operation which can be done quite readily with sufficient accuracy. The spots are obtained in succession round the edges of the blotting paper, which is in the form of a circular disc, rotated once in twenty-four hours and controlled by clockwork.

In the earlier form of the instrument the mechanism for drawing in the air was operated by water entering a vessel provided with a syphon, which caused the water to rise and fall between two fixed levels. During the fall, air was drawn through the filter disc, an arrangement being provided for making an airtight joint between the filter nozzle and the air inlet pipe during this operation. During the rise, the filter disc was unclamped and rotated to a point fixed by the clock, the filtered air being meanwhile expelled by the rise of water in the main vessel. This form of apparatus had certain disadvantages, of which the present writer can speak feelingly as a former Superintendent of the Instruments Division of the Meteorological Office, where one of these instruments is working. The necessity for a continuous water supply is a serious drawback, and experience has made it obvious that improvements were necessary in other features of the instrument.

In the new design, the filtering mechanism is operated entirely by a falling weight which is wound to the top of its travel once a day. No outside source of power is required, and the installation of the instrument is thus not restricted to sites where these are available. The descending weight operates a crank through a train of gearing, and this crank is connected to a reinforced rubber bellows, so that at each revolution the bellows is expanded and contracted. On the down stroke one litre of air is drawn in very slowly through the filter disc, which is gripped meanwhile between the top of the filter nozzle and a corresponding 'nose' above the paper. On the up stroke air is expelled from the bellows, the filter nozzle being meanwhile lowered out of contact with the paper. By means of an ingenious auxiliary clamping device operated by cams, the paper can be held in the same position while air is drawn in on one, two, four, or eight successive revolutions of the crank. In this way the volume of air contributing to each spot may be varied from one to eight litres, to suit the locality and season. This feature is, in my opinion, one of the chief advantages of the new instrument.

In the jet dust counter a sample of the air to be examined is caused, by means of a pump, to pass through a narrow slit behind which is a cleaned microscope cover glass. Before entering the slit the air passes through a cylindrical 'damping chamber' lined with wet blotting paper, and the velocity in the jet is such that a fall of pressure takes place and condensation occurs as a result of the adiabatic cooling. The water droplets and dust particles strike the cover glass, the dust adheres, and the water evaporates. In this way the dust in a known volume of air is obtained in the form of a narrow ribbon-like deposit on the cover glass, which can be examined quantitatively and qualitatively under a microscope. In the older apparatus only one record could be obtained on each glass, and, as several operations are involved, it was distinctly troublesome to get a series of records, for example, in different rooms of a building. In the new instrument, which has been put on the market by Messrs. C. F. Casella and Co., Ltd., the cover glass is carried on a rotatable head which can be operated from the back of the instrument. A two-way tap also is provided, by means of which the jet can be put out of action while the damping chamber is being flushed with the new sample of air. By the aid of these devices a series of, say, eight or ten separate records can be obtained on a single cover glass, the lines of deposit intersecting at the centre like the spokes of a wheel. With a suitable eyepiece and objective in the microscope, a rough preliminary comparison of the records can be made by inspection, since portions of two or more records can be brought into the field of view simultaneously. In this way the scope of the instrument has been greatly extended and the ease of manipulation much improved. E. G. BILHAM.

Importation of Scientific Specimens and Apparatus into Great Britain.

AS the result of a report by the Association of British Zoologists, the Council of the British Association in February 1931 appointed a committee to consider action with the view of the amelioration of the customs regulations affecting the importation of scientific specimens and apparatus. Following upon discussion between officers of the Association and the Custom House authorities, the latter have most kindly supplied the Association with a memorandum on the reliefs from customs duties on scientific instruments and cinematograph films, and from the import prohibitions on plumage likely to be of use to scientific workers, together with a note on procedure in respect of the importation of scientific specimens preserved in spirit.

The memorandum on scientific instruments and cinematograph films was supplied confidentially to enable the Association to advise *bona fide* scientific workers, but not for general publication, since some of the relaxations are extra-statutory and liable to modification or withdrawal as the interests of the revenue may demand. The British Association is, however, prepared to advise on specific applications from scientific workers or societies. Inquiries should be addressed to the Secretary of the British Association at Burlington House, London, W.1.

It clearly emerged in the course of discussion that some of the difficulties which have been encountered by scientific workers under the customs regulations might have been avoided by previous communication with the Board of Customs and Excise, Custom House, Lower Thames Street, London, E.C.3.

The procedure with regard to the importation of scientific specimens in spirit which will apply in future is as follows.

It will be necessary that the person by whom the specimens are imported into Great Britain (or the person or institution to whom they are addressed, in the case of specimens dispatched by a consignor abroad) should be formally authorised to receive spirits free of duty for use in an art or manufacture, under the provisions of the Finance Act, 1902, Section 8. Where, however, the importer or consignee does not already hold such an authority, the collector of customs and excise at the port of importation will grant it, subject to the conditions in the next paragraph.

If the specimens are imported as ship's cargo, the necessary customs entry must describe them as specimens preserved in spirits, with a sufficient description of their nature and the approximate quantity of spirits, and must show the name and address of the importer or consignee. With the entry must be produced

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