geny of the Vertebrates; the Henry Wilde prize between Maurice Leriche (2000 francs), for his palæontological researches, and Ferruccio Zambonini, for his work in mineralogy; the Caméré prize to David Wolkowitsch, for his memoir on the applications of geometry to the stability of constructions; the Gustave Roux prize to Marc André; the Thorlet prize to Adolphe Richard; the Albert I. of Monaco prize to Lucien Cuénot, for his biological work.

Special Foundations.—The Lannelongue foundation to Mmes. Cusco and Rück; the Hélène Helbronner-Fould prize to the late Mme. Yves Delage.

Prizes of the Grandes Écoles.—The Laplace prize to Henri Feltz; the L. E. Rivot prize between Henri Feltz, Pierre Julien Couture, Émile Bideau, and Camille Henri Foin.

Foundations for Scientific Research.—The Gegner foundation to Désiré Bois, for his book on the history, utilisation, and culture of plants used for food; the Jérome Ponti foundation to Robert Forrer, for his work on magnetism; the Hirn foundation to Maurice Kraïtchik, for his studies in the theory of numbers; the Henri Becquerel foundation to Jean Thibaud, for his work on X-rays of long wave-length and the joining up the ultra-violet and X-ray spectra; the Victor Noury foundation between Augustin Boutaric (3000 francs), for his work on colloids; Henri Baulig (3000 francs), for his book on the central plateau of France and its Mediterranean border, morphological study; the late Franz de Zeltner (2000 francs), for his work in western Africa; Pierre Lamare (2000 francs), for his geological researches in the Yemen; and Raymond Hovasse, for his biological and zoological work; the Charles Bouchard foundation to Léon Binet, for his experimental researches on apparatus for perfusion and artificial respiration; the Henry Le Chatelier foundation to Marcel Ballay, for his researches on the beryllium alloys; the Pierre Lafitte foundation to Raymond Jouaust, for the whole of his work on radio-electricity; the Roy-Vaucouloux foundation to Joseph Magrou, for his work on the production of tubercles and galls in plants.

THE LOUTREUIL FOUNDATION.

The Academy has considered twenty-nine applications for grants from this fund, and has made the following twenty-two awards, amounting in all to 121,000 francs:

1. *Researches on Definite Problems.*—10,000 francs to Louis Dunoyer, for the extension of his researches on photoelectric cells; 5000 francs to Raymond Ricard, for his researches on the spark spectra of metals; 5000 francs to Jacques Duclaux, for his work on the measurement of the transparency of the atmosphere; 4000 francs to Maurice Fontaine, for his researches on the physiology of marine organisms; 3000 francs to François Maignon, for the continuation of the study of the influence of the seasons and of the genital glands on respiratory combustion; 3000 francs to Gabriel Petit, for his researches on the grafting of endocrine glands; 3000 francs to Jean Verge, for his researches on d'Herelle's bacteriophage and its applications in veterinary medicine; 4000 francs to the viticulture laboratory of the National Hygronomic Institute (Director, Pierre Viola), for various researches in plant pathology now in progress.

2. *Voyages and Exploration.*—5000 francs to Charles Alluard, as a contribution towards an expedition to the southern Sahara; 3000 francs to Norbert Casteret, for his spelæological explorations in the Pyrenees; 4000 francs to Auguste Méquignon, for the continuation of his entomological researches in the Azores archipelago.

3. *Purchase of Material.*—3000 francs to Emilio Damour, for the completion of the installation of the glass laboratory at the Conservatoire national des arts et métiers; 3000 to Jean Georges Lafon, to complete the installation of electro-cardiography at the physiological laboratory of the National Veterinary School of Toulouse; 1000 francs to the Arcachon Scientific Society, as an aid to building.

4. *Libraries.*—15,000 francs to the National Museum of Natural History, for producing a catalogue of the books contained in the laboratory libraries; 12,000 francs to the Lyons National Veterinary School, and 4000 francs to the Toulouse National Veterinary School, for increasing their libraries.

5. *Publications.*—5000 francs for the Fauna of the French Colonies; 5000 francs to the French Federation of Societies for Natural Science; 15,000 francs for the continuation of the catalogue of the scientific periodicals in the libraries of Paris; 5000 francs to Emmanuel de Margerie, for the preparation of a geological map of Africa; 4000 francs to the Science Museum of Lyons, for assisting the publication of a memoir by L. Germain on the Helicides of the French fauna.

Fruit Cultivation in Great Britain.

AMONG the recent bulletins issued by the Ministry of Agriculture, those entitled "Fruit Production—Tree Fruits, No. 2", and "Fruit Production—Soft Fruits and Nuts, No. 4", are particularly welcome, as in the present economic condition of the commercial fruit-growing industry all available information as to the results of recent research should be studied by growers, and, where possible, applied to the elucidation of the many problems connected with this highly specialised calling. In these publications the amateur and the professional grower have access to much valuable advice, written in language at once clear and concise and not overburdened by technical terms.

The factors dealt with in the opening chapter on the planning and planting of an orchard merit close attention, as miscalculations on these matters are of frequent occurrence and in after years are extremely difficult to rectify.

The question of shelter is dealt with briefly, but it is difficult to over-emphasise its importance in the economy of a commercial plantation, as losses from high winds occur annually, and are occasionally of a very serious character. Three conifers are recommended as wind-breaks, but they are comparatively expensive. An excellent shelter belt may be formed by planting a mixture of common larch and spruce fir, which in a young state may be purchased at a cheap rate.

Information as to progress made in classification and suitability of vegetatively propagated stocks for various purposes is extremely helpful, as many amateurs fail to realise the influence of 'pedigree' stocks on the future behaviour of their trees. It is suggested that vegetatively propagated stocks, such as East Malling Types X., XII., XIII., XV., and XVI., may replace seedling stocks, but the existence of numerous orchards containing very large but possibly unremunerative apple trees testifies to the vigour of the stocks employed by earlier planters, and further information is desirable as to the ability of these standardised stocks to withstand the deleterious effects of grass.

The bulletin rightly stresses the importance of a rigid selection of plum stocks, and condemns the

practice of utilising suckers, carelessly taken from plum orchards for propagation purposes, owing to the risk of working stocks infected with 'silver leaf'.

The thorny subject of pruning is dealt with in a masterly manner, and the section devoted to this important operation will appeal to the many amateur fruit-growers who, owing to well-meant but occasionally contradictory suggestions of numerous advisers, are hopelessly at sea on this matter. The general principles are clearly indicated; it is pointed out that no hard and fast rule can be applied to all species and varieties, but that the system of pruning should be modified in accordance with their special characteristics.

It is doubtful if the extended commercial cultivation of pears in Great Britain is worthy of consideration, as imported produce of high quality is now available for the greater part of the year. Much useful information respecting up-to-date storage methods is contained in a chapter devoted to this subject, but further research is needed.

Renovation of old orchards and the control of pests and diseases of fruit trees are ably dealt with, and the bulletin should be in the hands of all who wish to see an improvement in the general standard of fruit culture, and are interested in the future of an important home industry.

Bulletin No. 4 deals with 'soft fruits', which now form an important section of the British fruit industry, and its contents comprise the more important results attained by research workers, and also details of sound cultural methods.

The descriptive lists of standard commercial varieties should be of great assistance to intending planters, and information respecting varieties suitable for canning will enable growers to cater specially for this purpose. Black currants and gooseberries in recent years have failed to give remunerative returns, and the area devoted to these crops will probably decrease. Figs and melons are among the fruits included in the bulletin, but their commercial cultivation is likely to remain in the hands of a comparatively few growers. Cob nuts and filberts realise high prices and there appears to be ample scope for their extended cultivation; the nut is not fastidious as to soil, but possibly the prevailing system of land tenure is responsible for the small area devoted to this and other 'permanent' crops.

Rainfall of the United States.

SUPPLEMENT Number 34 of the *Monthly Weather Review* of the United States Department of Agriculture is a summary giving the main results of fifty years of organised rainfall measurement, in the form of daily, fortnightly, monthly, and annual normals of precipitation for the regular first order stations of the U.S. Weather Bureau.

The need for a revision of the normals for the United States available before this publication appeared arises from the fact that the last revision was made so long ago as 1907, since when many new stations have been started. The new normals all refer to the period January 1878 to December 1927 inclusive. Where a complete record has not been available, the usual procedure has been adopted, namely, an adjacent station has been selected for which the full fifty years' record is available, and its measurements have been compared with those at the station with the incomplete record throughout the period of overlap of the two records. In this way the relative degree of wetness has been obtained, and thence a correction which, when applied to the normal computed from the period of overlap, gives a close approximation to the required normal.

A publication of this kind, consisting of little more than a vast array of figures in tabular form, is clearly not to be regarded as reading matter in the ordinary sense even for the expert meteorologist. It would, however, have been more nearly so had there been a key map showing the positions of all the places for which normals are given, preferably with shaded or coloured altitude zones, and any other features that might assist in explaining the great diversity in the amount and seasonal distribution of the precipitation, which a careful inspection of the tables reveals. For the work has under review the rainfall of a country in which virtually rainless areas exist side by side with areas of great altitude and wetness, where lofty mountain peaks force the moist westerlies from the Pacific to rise and undergo such dynamical cooling that a large proportion of their moisture is condensed to rain or snow. A rapid survey of the normal annual falls did not reveal any total that is not surpassed in the Lake District of England, but showed many smaller than can be found anywhere in the dry eastern lowlands of England and Scotland. Yuma, Arizona, has the interesting annual normal of 3·47 inches, based on a full fifty years' record.

In addition to its value in general climatology, this work is obviously of the first importance to American water engineers and to many of the industries of the States, particularly farming. E. V. N.

Parliamentary Representation of the Universities of Great Britain.

IN view of the clause relating to the abolition of university constituencies which appears in the Representation of the People Bill, the text of which has recently been issued, a joint memorandum has been submitted to the electors of the Universities of Oxford and Cambridge by their present parliamentary representatives. The memorandum gives a brief history of university representation in Great Britain. In 1603 James I. by a charter issued on the advice of his Attorney-General, Sir Edward Coke, granted to the Universities of Oxford and Cambridge the right, which they have ever since enjoyed, of each returning two burgesses to Parliament. A similar right of representation in the Irish Parliament was accorded to Trinity College, Dublin, ten years later. By the time of the outbreak of the War there were nine university members in the House of Commons, returned by the following constituencies:

	Voters.
Oxford (2)	6,895
Cambridge (2)	7,145
Dublin (2)	5,020
London (1)	6,070
Edinburgh and St. Andrews (1)	11,319
Glasgow and Aberdeen (1)	11,714
	48,163

A large measure of parliamentary reform and a great extension of the franchise were undertaken by the Coalition Government in 1918. Three new university constituencies, the Combined English Universities,