The Forthcoming Pasteur Centenary Celebrations at Strasbourg.

WE have already announced that the Government of the French Republic has desired to commemorate this year the centenary of Louis Pasteur, and Strasbourg, where this illustrious savant commenced his scientific and university career, has been very fittingly chosen as the scene for the celebrations. Chief among these will be an international scientific exhibition—L'Exposition Internationale du Centenaire de Pasteur—which has been organised with the object of setting forth the fruits of Pasteur's work, not only in the domain of medicine but also in those of industry and agriculture. This exhibition will be officially opened on June 1 in the presence of the President of the French Republic, members of the French Government, and scientific delegates from all over the world. On the same day a monument erected to the honour of Pasteur in the Place de l'Université will be inaugurated, and a further permanent memorial is to take the form of a Museum of Hygiene. This will consist of a collection of exhibits illustrative of the various researches of Pasteur, and will constitute a history, in concrete form, of the early years of the science of microbiology.

The International Exhibition promises to be a most extensive and complete demonstration of the manifold results of Pasteur's work, both in pure and in applied science. It is to be organised in twelve groups, namely, microbiology, chemistry and chemical industry, collective hygiene, general hygiene, physical training, town hygiene, alimentary hygiene, food industries, refrigeration, agriculture, silks and sericulture, and finally a group devoted to scientific literature. In order that the exhibition should attain to that plane of excellence which would make it at once worthy of the man in whose honour it is being held, and an attraction to men of science, the organisation of the various groups and their sections has been entrusted to those who, by their work, are specially qualified in the various branches of science represented.

The groups of microbiology and collective hygiene are naturally the largest and perhaps the most interesting. The former, under the presidency of Dr. Roux, comprises in all nine sections. There will be a section devoted to diseases of man, including bacteriological and immunological technique, and sections dealing with vaccinia and vaccine institutes, tropical diseases and hygiene, diseases of plants, veterinary diseases, diseases of silkworms and other insects, parasitic insects, nitrification and sterilisation of soil —a most comprehensive list. The group of collective hygiene, with its six sections, is to deal with matters of the greatest importance, such as industrial diseases, tuberculosis, venereal diseases, cancer, maternity and infant welfare, military hygiene, and the organisation and installation of hospitals; and the names of such well-known scientific men as Dr. Calmette and Dr. Louis Martin, among the presidents of these sections, is a guarantee of the standard of excellence which will be reached in this group. But it is not only the man of science who will find interest in this exhibition. The sciences of chemistry and microbiology find their application throughout industry and in all phases of our modern civilisation. It is one of the objects of this exhibition to emphasise this interdependence of science and industry, and, to judge from the list of industries which will be represented by exhibits in the various groups, this aspect of the question has not been overlooked.

The exhibition will remain open till October, and during this period congresses on various subjects are to be held. In this manner it is proposed to discuss such subjects as tuberculosis, housing, town hygiene, cancer, leprosy, syphilis, puerperal fever, and milk. The general secretary of the exhibition is Prof. Borrel, director of the Institute of Hygiene and Bacteriology of Strasbourg.

Chemical Characteristics of Australian Trees.

MR. HENRY G. SMITH, of Sydney, in his presidential address to the section of Chemistry at the meeting of the Australasian Association for the Advancement of Science, held at Wellington in January last, dealt particularly with the elucidation of some chemical characteristics of Australian vegetation, treating the subject in relation to the generalisations that may reasonably be advanced from the consideration of the results secured by the phyto-chemical study of the principal Australian genera, such as Eucalyptus and Callitris. This study extended over a period of more than thirty years, and was undertaken in conjunction with his botanical colleague, Mr. R. T. Baker.

Some of the chemical peculiarities brought to light during this investigation appear to be characteristic of this unique flora, and indicate a distinct uniformity in progressive characters, suggesting evolutionary processes as the directing influence in the production of the numerous groups and species which, in the aggregate, go to form the more important genera.

The genus Eucalyptus apparently originated in what is at present the western and north-western portions of Australia, and as it spread eastward and experienced varying degrees of soil and climate the conditions demanded by these new locations and climatic changes were met by the responding characteristics of the genus.

The chemical peculiarities of nearly two hundred distinct species were determined, so that many data were obtained upon which to formulate the more recent theories regarding the formation of the distinctive groups.

Eucalyptus is essentially an oil-producing genus, and already about forty distinct chemical constituents have been isolated and characterised. These include 11 alcohols; 9 aldehydes; 2 phenols; 7 esters; 5 terpenes; 1 ketone; 1 sesquiterpene; 1 paraffin; and also cymene and cineol.

The two main factors controlling the chemical sequence throughout the genus may be stated in the following terms: (1) The same species of Eucalyptus has chemical properties of a comparatively constant nature wherever found growing under natural conditions, and (2) each constituent follows the sequence of species in increasing amount until a maximum is reached in one or more of them.

These conditions are not only true for the several oil products, but may also be applied to the astringent exudations or kinos produced in varying amounts by all the species. The characteristic features of these exudations are traceable right through the genus, and are particularly noticeable with the two crystalline substances, aromadendrin and eudesmin, found in the older species of the genus. These substances become extinct when the group of "ironbarks" is reached in the sequence of evolution, and are, of course, absent in all the more recent species, such as those belonging to the "stringybarks," "pepper-

mints," "ashes," etc. Eudesmin is a particularly interesting substance, and occurs in the kinos of some species to the extent of ten per cent.

The address also dealt with the chemical peculiarities of the Australian Coniferæ, and in addition with the inorganic constituents peculiar to Eucalyptus trees, instancing the small amounts of mineral matter secreted in the timbers of those species which often occur as very large trees, such as *E. regnans*, *E. pilularis*, etc., a condition that suggests the reason for their continued growth and great size.

The occurrence of manganese, and its importance, were also discussed, the conclusions being based upon the results of much experimental work. It was shown fairly conclusively that the presence of manganese in such minute quantities cannot be considered as accidental, but a necessary constituent for successful growth of these trees, and that some species belonging to certain groups require a larger amount of manganese than is necessary for the growth of those belonging to other groups. The whole question evidently hinges around the action exerted by the enzymes in the structural formation of forest trees and their chemical constituents, and is thus a subject requiring long-continued chemical research and experiment before a reasonable solution of the problem can be expected.

Sunshine-Recording.

IN the sunny southern countries of Europe less general interest appears to be taken in the recording of sunshine duration than is the case in England, where a certain therapeutic importance is attached to an allotment of sunshine which in winter undoubtedly falls below the optimum, although probably not to a greater extent than it rises above the optimum during a Mediterranean summer. However this may be, it is interesting to find the subject discussed in a short article by Guilio Grablovitz in the comparatively new Italian publication *La Meteorologia Pratica* for July and August 1922.

Various objections are raised to the continued use of the Italian words *insolazione* and *soleggiamento* to denote sunshine, the term *eliofania* being advocated instead, which would be anglicised to *heliophany*. It appears that the two former terms have medical significance in connexion with bad and good effects of exposure to the sun, from which our corresponding word "insolation," which is virtually equivalent to the more familiar "sunshine," is free.

Discussion in the paper turns upon the proper dates for replacing the equinoctial card by the summer and winter ones in the well-known Campbell-Stokes sunshine recorder, in which the sun's rays, focussed by a glass ball, leave a charred record. It is argued that the dates officially adopted for the change, namely, February 22, April 20, August 23, and October 22, when the declination of the sun is 12°, might with advantage be altered to March 1, April 11, September 3, and October 15, when the declination is 8°; because in the latter case, during the passage of the sun through a range of 47° between the solstices, the equinoctial, summer, and winter cards would each be used through an equal range, approximately of 16° ($16 \times 3 = 48$), whereas in the adopted practice the equinoctial card covers a range of 24° ($12 \times 4 = 48$). This is a purely technical point to be settled by reference to the design of the instrument; but on wider grounds, astronomical and climatic, the dates actually adopted seem more natural because, the solar declination being then 12° N. or S., that is, practically half-way between 0° and 23½° N. or S., they mark what should be regarded as the real boundary between the solstitial and equinoctial periods of the year.

In connexion with sunshine-duration recorders, one can scarcely refrain from commenting upon the inadequate character of instruments which give no information about the quality or intensity of the recorded sunshine, and from expressing the hope that these will gradually be superseded by radiographs like the Callender recorder and Ångström pyrrheliometer, which indicate the amount of solar energy received in a given time. Such radiographs may not be all that is desired, but at least they show the difference between the intensity of insolation on different days, at different seasons, and in different latitudes or altitudes. They can, for example, differentiate in comparable measured terms between the fitful sunbeams of December and the fiery rays of June; or show, again, that a hot day in England with, say, an air temperature of 90° F. is thermally less fierce than a day in Italy having the same air temperature but under a force of insolation unknown in Northern Europe. The point is that equivalent air temperatures are not truly climatically equivalent unless associated with the same intensity of insolation, and it is well known what an important factor in the economy of living creatures is the direct radiation of light and heat. L. C. W. B.

Trieste and Marine Biology.

DR. M. STENTA, director of the Natural History Museum in Trieste, delivered an address, in October 1921, at the Trieste meeting of the Italian Society for the Advancement of Science, on the important part played by Trieste in the study of marine biology, and the address has recently been published (*Atti Soc. Ital. Progr. Sci.*).

Dr. Stenta referred to the observations of Abbot Fortis published in 1771 on the islands of the Quarnero, and those of Abbot Olivi (1792), who gave, in his "Zoologia Adriatica," a catalogue of the animals of the Gulf of Venice. Almost all the naturalists who visited Trieste in the first half of last century were German; of these, two may be named—I. L. C. Gravenhorst, who recorded (1831) the results of his studies on various molluscs, echinoderms, and Anthozoa; and J. G. F. Will, who gave an account (1844) of the anatomy of Scyphozoa, ctenophores, and siphonophores. K. E. von Baer came in 1845 from Russia to Trieste to search for larvæ of echinoderms, but the results in that and in the following year were not very satisfactory. His visit, however, was fruitful in another respect, for he encouraged Koch, a young Swiss merchant resident in Trieste and an ardent collector, in his project of founding a museum of the Adriatic fauna, which became the centre of studies on the Gulf of Venice. Johannes Müller spent the autumn of 1850 in Trieste working on the development of echinoderms and worms, and in the neighbouring bay of Muggia he discovered in *Synapta digitata* the parasitic mollusc *Entoconcha mirabilis*.

Among many who worked at the museum between 1850 and 1870 were Oscar Schmidt, who carried on researches on sponges; A. E. Grube, who examined the annelids and discovered the parasitic rotifer *Seison nebaliae*; and Kowalevsky, who described (1868) the remarkable sexual dimorphism in *Bonellia viridis*. In 1874 the Adriatic Society of Natural Science was founded, and the 27 volumes of its Bulletin are rich in observations on the biology of the area.