achievement, leaders of thought, were next sought from the various divisions of the National Research Council, as well as from the secretaries of the different sections of the American Association for the Advancement of Science and of certain societies of specialists. The response to these requests has been generous and, for the most part, prompt.

It is hoped that guests accepting the invitation will appear on the program of the association's meeting and will also be available for one or more public lectures in various scientific centers. For a number of years past the program of the American Association for the Advancement of Science has been a highly important one, even when limited entirely to the productive scholarship of America. The foregoing plan is intended to enrich the regular program and is felt to be in full harmony with the international character of the exposition.

No attempt will be made to give, in a single week, a cross-section of human knowledge: but it is believed that a bird's-eye view of the main lines of present-day research will be presented and will render the 1933 meeting a memorable scientific occasion. The aim is to establish personal contact between an intelligent audience and the leaders in science. The Century of Progress is the name under which this exposition is incorporated; but there is here no implication that it is a backward looking institution. The whole purpose is, indeed, to point the way to another coming Century of Progress, to demonstrate the unity and importance of science. Every effort will be made to eliminate from this meeting the turmoil and bustle of a world's fair by the selection of appropriate meeting places. But if, in these efforts, the local management is not in every way successful there will be compensations, illuminations of mind and matter, and foregatherings, which will leave the balance on the right side.

By action of the council of the American Association for the Advancement of Science at its recent meeting in Los Angeles, the exact date of the Chicago meeting was fixed as the last full week in June, 1933.

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CHICAGO CENTENNIAL EXHIBITION

THE MARINE LABORATORY OF THE UNIVERSITY OF SYDNEY, AUSTRALIA

I HAVE just received from Professor W. J. Dakin, of the department of zoology, University of Sydney, New South Wales, Australia, a letter in which he informs me that, notwithstanding the great financial stringency in Australia he has succeeded in procuring funds for the establishment of a small temporary marine laboratory and the acquisition of an auxiliary yacht of 13 tons. Both the laboratory and the yacht belong to the department of zoology of the University of Sydney. A program of investigations without aid from the state is being carried out, although serious financial difficulties beset the University of Sydney. At present particular attention is being devoted to the plankton and certain hydrographic conditions to a distance of about five miles off shore east of Sydney. Already plankton catches have been taken regularly for eighteen months. Professor Dakin himself has been conducting experiments on the osmotic pressure of the blood of certain marine organisms apart from investigations that he has already made on "The osmotic concentration of the blood of *Callorhynchus millii* and *Epiceratodus* (*Neoceratodus*) *forsteri*, and the significance of the physico-chemical condition of the blood in regard to the systematic position of the Holocephali and the Dipnoi."[1]

Professor Dakin writes that his laboratory is very badly off for literature and that he is unable to raise more money to face the adverse exchange rates. He has asked help in obtaining literature, especially on the physical and chemical methods of oceanography and on plankton. It has occurred to me that by publishing this note in SCIENCE assistance for Professor Dakin's struggling laboratory might be procured. He says: "We are doing our utmost with private funds and often risking life too by working from inefficient boats on a most unruly because unprotected sea." Will those who are willing to send literature please address it as follows: Professor W. J. Dakin, Department of Zoology, University of Sydney, New South Wales, Australia. Any help that may be extended will be very greatly appreciated.

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DEVELOPING NEW VARIETIES OF HOPS

LAST fall work was initiated to develop new varieties of hops. Because of an attack of downy mildew, *Pseudoperonospora humuli* (Miy. et tak.) Wils., it was desired to obtain new varieties which were not only resistant to this disease, but also superior in yield and quality. The variety Fuggles has been reported as resistant to this disease. This variety, however, under most Oregon conditions, is considered low in yielding ability and of a quality that is desired only by a certain trade.

Naturally fertilized seeds of this crop were collected in the growers' yards. Preliminary trials showed that the seed was dormant and would not grow under ordinary germinating conditions. The seed, therefore, was chilled for about ten days at freezing temperatures and then scarified by rubbing on coarse emery

[1] Zool. Soc. London, *Proc.*, pt. 1, pp. 11–16, April 14, 1931.

paper. This seed was planted in the greenhouse on October 9 in flats and the seedlings were transplanted to a bed after they had made a growth of about 12 inches. Artificial lights (three 500-watt Mazda lamps for 100 plants) were turned on from 5 to 12 P. M. each night. Plants 20 feet in length were developed by March 29, and two of the plants came into burr (blossom) at this date. A growth of 12 inches was recorded in one day. This development of a hop plant from seed to blossom in less than six months' time indicates the possibilities of rapid development of new varieties. Professor E. S. Salmon, in England, stated that the "work of raising new varieties of hops is an arduous and expensive one and is necessarily very slow, since the seedling plants do not bear a crop until the third year, and can not be judged for character such as aroma, richness in resins, and cropping powers until the fifth year, at the earliest."

The use of chilling and scarification of seed, the greenhouse and the lights are of great assistance in speeding up a program of breeding with a crop of this type. The striking variability of seedlings indicates a great difference in the value of the different plants. Of course, it will take additional time to test out not only their disease resistance, but also their yielding ability and quality. Also, some time will be required to increase their vegetative parts for planting stock.

This procedure not only speeds up the breeding program, but also gives available plants for testin. in the spring when inoculum of the downy mildew disease, which is a true parasite, is plentiful.

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OREGON STATE AGRICULTURAL COLLEGE

POLYEMBRYONY IN RED SPRUCE

IN the course of a germination test of red spruce *Picea rubra* (Link.) collected in eastern Maine in the fall of 1930, two well-formed radicles, each about 2 cm long, were observed protruding from the same seed coat. Unfortunately, upon removing the sprouted seed the root tips were damaged, so that it was impossible to grow the seedlings. Upon dissection two sets of well-formed cotyledons were disclosed. Both seedlings appeared to be of equal vigor, so that it seems probable that two normal seedlings would have developed, had they been undisturbed. Similar phenomena have been reported by Jacobs[1] in sugar pine, *Pinus lambertiana* (Doug.), in 1 per cent. of all seeds tested by him, and recently by Woodworth[2] in *Alnus rugosa* (Du Roi) Spreng, but the writers are unaware that polyembryonism has been recorded in red spruce. During nearly 300 tests of this species, aggregating over 30,000 seed, this has been the only case observed.

HENRY I. BALDWIN
WARREN E. PERCIVAL
BERLIN, NEW HAMPSHIRE

[1] Allen W. Jacobs, "Polyembryonism in Sugar Pine," *Jour. For.*, 22: 573–574, 1924.

[2] Robert H. Woodworth, "Parthenogenesis and Polyembryony in *Alnus rugosa* (Du Roi) Spreng.," SCIENCE, n. s., 70: 192–193, 1929.

ABBREVIATIONS FOR SCIENTIFIC AND ENGINEERING TERMS

NEARLY two hundred years ago an Englishman determined the value of π to 707 decimal places. One state legislature is said to have "standardized" the value of π as 3. Between these impracticable extremes lies the value which has served, and will continue to serve, the purposes of science.

As a matter of convenience, abbreviations have been established for many words which are in frequent use or which are cumbersome by reason of length. Many of these abbreviations, though not logically derived from the English words which they now represent, have been sanctioned by custom, and the period at the end is the generally accepted sign of an abbreviation. A chemical symbol is quite generally written without the period, and thus in present usage there is a distinction between C (for carbon) and C. (if that form be used for centigrade).

The list of "Abbreviations for Scientific and Engineering Terms" prepared by a sectional committee of the American Standards Association proposes to abolish the period, to change many of the time-honored forms of abbreviation, and in many instances to "standardize" two forms of abbreviation for the same word.

Elimination of the period is proposed "in the interests of economy and the reduction of waste." It is difficult to see how this will be realized. No economy of time is indicated in printing and proofreading where the printer is expected, for example, to set "cu m" (for cubic meter) and (in the absence of periods which determine the spacing) to decide whether cum or cu m is the proper form.

Though the American Association for the Advancement of Science is given as one of the organizations sponsoring this proposed list of abbreviations, the writer has consulted a number of association members without finding one who knew of the list, or who favors it in its present form.

If the list is to be sanctioned by the association, many members who are careful in their use of English will no doubt be interested in the proposed forms. The list appeared in the "ASA Bulletin" of July, 1930, and in a publication dated January, 1931, designated as "A. S. A. Z10i–1931."

The list is not a very long one, but its adoption