on Tuesday, July 21. The popular lecture will be given by Dr. R. R. Marett on July 24, the subject being "Anthropology and Medicine." The sections will meet for three days from July 22 to 24.

IN accordance with the settlement of the estate of the late James Loeb, banker of New York City, who died three years ago, Harvard College receives the sum of $829,793.

THE work of the Rothamsted Experimental Station in the study of soil science, plant nutrition and plant disease is reviewed in a report for 1934 recently issued and summarized in the London *Times*. The activities of the station include experiments on the parent farms at Rothamsted and Woburn, amplified by similar trials at outside centers, and in the laboratory the application of chemistry, physics and biology to problems arising in crop production and utilization. The results of recent fertilizer investigations are summarized and detailed accounts given of the field experiments in 1934. In a series of review articles on the contribution of some of the departments to soil science, Dr. Keen writes on soil physics; Dr. Crowther on chemistry of soils and fertilizers; Dr. Thornton on soil bacteriology, and Mr. Cutler on general biology. Sugar beet growers will find interesting the results of extensive fertilizer tests carried out in conjunction with the factories; nitrogenous manures were the most important in improving sugar per acre in 1934. Accurate information on the effects of organic manures, and in particular of dried poultry manure, is beginning to accumulate. Work has been continued on the maintenance of organic matter by ploughing in straw, or manures made from straw, or green manures, and, in conjunction with the continuous cereal plots testing the effects of bare fallowing, is of special bearing on soil fertility under mechanized cereal farming. In addition to fertilizer tests, problems in general husbandry are being studied. For example, the preliminary results of comparisons of electric motors with oil engines for threshing are on record. The report also contains a summary of the Rothamsted work on virus diseases. It has been found that the inoculation of a plant with one strain of virus may protect it against a later inoculation with another more virulent strain of the same virus. The part played by insects in the transmission of these diseases is discussed in the light of recent experiments.

DISCUSSION

ROYAL PALMS IN UPPER FLORIDA

THE royal palm of Florida, *Roystonea floridana*, the most striking member of the endemic flora, was nearly exterminated in the pioneer period, with the egret, the flamingo and the parrakeet. Ponce de Leon may have seen an undevastated Florida canopied by thousands of royal palms, with their huge pendent clusters of grape-like purple fruits feeding great numbers of wild turkeys, deer and other game. The royal palms grow twice as tall as the palmettos, a hundred feet or more, and far overtop the tropical forest. The early accounts of Florida as a terrestrial paradise, "the fairest, fruitfullest and pleasantest of all the world," may have had more warrant than critical historians have believed.

The pioneer period of cabbage-cutting and grass-burning lasted more than three centuries, and the royal palms were reduced to a few scattered groups protected from fire by open water or belts of deep swamps, remote from human habitation and well-nigh forgotten. The first to be recognized as a royal palm, by Cooper in 1859, was an isolated individual on the site of the future Miami, and Cooper heard of others "in large groves between Capes Sable and Romano," but little information could have been current or the palm-groves would have been visited by exploring naturalists like Townshend, Ober and Henshall.[1] By the end of the century the west coast palms had been depleted to furnish tropical settings for winter hotels at Miami, Palm Beach and Fort Myers. Only one group of the wild royal palms has been preserved and made accessible to the public, at the Royal Palm State Park southwest of Homestead, and a part of this small reservation burned over a few years ago.

Several larger groups remained undisturbed till recent years in the Big Cypress Swamp east of Naples. When the Tamiami Trail was opened, many of the palms could be seen along the sky-line, that later were set in the triumphal avenue of a racing establishment near Miami. Dirigibles were used to locate other groups farther north, and some were found that recent fires had ravaged. Drainage and road building are increasing the fire hazards, so that complete extermination of the wild royal palms is the prospect to be faced.

Two outlying groups are known to have existed, one in upper Florida, near De Land, the other at Little River, now a suburb of Miami. The northern group was noticed only once, in 1774, but the record is authentic. The following passage in William Bartram's "Travels" was brought to my attention several years

[1] F. T. Townshend, "Wild Life in Florida," 1875; F. A. Ober, "Fred Beverly," in C. Hallock, "Camp Life in Florida," 1876; J. A. Henshall, "Camping and Cruising in Florida," 1888. Henshall made two expeditions, in 1878 and 1881.

ago by Mr. Harold H. Hume, now assistant director of research of the Florida Experiment Station:

> The palm-trees here seem to be of a different species from the cabbage-tree; their straight trunks are sixty, eighty, or ninety feet high, with a beautiful taper, of a bright ash colour, until within six or seven feet of the top, where it is a fine green colour, crowned with an orb of rich green plumed leaves. I have measured the stem of these plumes fifteen feet in length, besides the plume, which is nearly of the same length.

The tall, symmetrical trunks, green at the top, and the "plumed" leaves leave no doubt that royal palms were seen, and the locality has been identified by Cooper and Small as Lake Dexter, a few miles northwest of De Land, about twenty miles inland from Daytona, in a latitude of 29°. The fact is significant, since a tropical designation is hardly to be denied to districts where royal palms were a feature of the native forest. In the Gulf-Stream climate of Bermuda, royal palms grow at 32°, the latitude of Charleston. The Florida peninsula is enclosed by the Gulf Stream, but denuded interior districts become dry and frosty.

Small suggests a warmer climate in the century before Bartram, but surface protection often determines the survival of a young palm or other tender plant. The royal palms are specialized to live as forest undergrowth during their early development, and do not begin to fruit until the trunk is twenty-five to thirty feet tall. Frosts may be worse from clearing more land in upper Florida, but at Indian River City royal palms have lived for many years, an African oil-palm (*Elaeis guineensis*) at Orlando and a Brazilian Acrocomia at Sanford. Ball and others found little difference in winter temperatures between the celery districts at Sanford and those near Sarasota, a hundred miles farther south.

The palms at Little River, hidden among mangroves in a brackish tidal swamp, were located by Munroe and shown to Sargent in 1885, though Cooper's lone palm of 1859 probably was an outlier of this group. Munroe planted "a number of these palms" in his garden at Coconut Grove in 1886, and published in "The Commodore's Story" a photograph taken in 1906 showing three mature palms forty to fifty feet tall.

Young Roystoneas in favorable places may attain twenty feet in six years from the seed, including two or three years before setting out, where seedlings are grown in pots. Transplanting from nurseries often results in root injuries and setbacks, with survivors permanently disfigured by short-jointed, narrow trunks. The lower joints often are six to nine inches long on normally developed royal palms, and the trunk at the base may exceed three feet in diameter.

Groves and shelter-belts of royal palms would greatly enhance the scenic beauty of Florida, instead of the few that are set along streets and roadways. Thousands of young palms are needlessly sacrificed every year, that in a few seasons would build their stately gray columns and spread their burnished emerald plumes. The seeds are scattered by the birds, and great numbers of seedlings spring up, only to be hoed out with the weeds, the first-season leaves being narrow and simple like coarse grasses. If the seedlings were recognized and protected, the royal palm might become an abundant tree over most of the peninsula, to judge from the varied habitats of the wild groups, fresh and brackish swamps, reef rocks and shell mounds. Fire control and irrigation are in prospect through adjustment of water levels by canals, roadways and embankments, so that a general forest cover may be restored eventually, of palms, rubber trees and other tropical vegetation.

Allied species of royal palms in the West Indies furnish building materials and have many domestic uses. Palm-groves are specially valued in pastures or farm-yards for cattle, pigs or poultry, the dried fruits of the Cuban species showing 18 per cent. of oil in Jamieson's analysis. Another use of palm-groves is for sheltering gardens or orchards against trade-winds and hurricanes. The royal palms reef down in severe storms by shedding their foliage, but the terminal bud is wrapped in the tough leaf-sheaths and the rigid trunks remain standing, even where coconut palms are destroyed.

O. F. COOK

BUREAU OF PLANT INDUSTRY
U. S. DEPARTMENT OF AGRICULTURE

ON COLLEGE SCIENCE LABORATORIES, SCIENCE INSTRUCTION AND RESEARCH

A RECENT announcement that the committee on standards of the American Council on Education has withdrawn the council's "Statement of Principles and Standards of Accrediting Institutions," adopted in 1924, is of possibly more than passing interest to scientific men at large. It may recall the inertia of the latter group as a whole when the current procedures and requirements for accrediting college science laboratories were first adopted, in contrast, for example, with the alert attitude of the professional societies associated with the general field of English. The writer[1] has dealt elsewhere with some of the difficulties growing out of present accrediting systems so far as they concern the conditions under which science instruction is sometimes given but in particular with situations which militate against productive scholarship, adequate tenure provisions and other difficulties of the profession which may be involved.

[1] *Science Education*, 19: 1, 1–5, February, 1935. Paper presented before Section Q—Education, American Association for the Advancement of Science, Atlantic City, N. J., December 27, 1932.