of the trunk, showed typical *E. Altensteinii* characters. In Baron von Müller's time the plant probably agreed with the taxonomic description, which was certainly based upon a young plant. No plant of *E. Altensteinii* with a trunk more than three meters high is likely to agree with the taxonomic diagnosis.

The big cones, as in most of the species, have seeds with a brilliant red seed coat.

The remaining section, which might be called the *horridus* section, on account of its forbidding leaves, comprises four species, all confined to the southern part of the cycad range.

Encephalartos Frederici Guilelmi occurs in greatest abundance at Queenstown and Cathcart. It has a majestic trunk and a fine crown of glaucous leaves. The leaflets are pungently pointed but the margins are not spiny, so that it is only by the numerous intergrades between this species and the next that it deserves a place in the *horridus* section. No other cycad has such a densely tomentose bud. The cones, sometimes five or six in number, are lateral and are arranged around a central bud.

Encephalartos Lehmannii is often confused with the preceding species, but has a broader leaflet, which may be entire, or spiny or may have big, coarse teeth like *E. horridus*. The staminate cones, which have a reddish color and are not very hairy, distinguish the species at a glance. The ovulate cones are equally characteristic, being very tomentose in *E. Frederici Guilelmi* and nearly smooth in *E. Lehmannii*.

The type of the section is *E. horridus*, whose jagged leaves, as sharp and rigid as if they had been cut out from sheets of tin, give this plant a clear title to its name. No cycad is more xerophytic and the various aloes, cotyledons and crassulas associated with it would make a fine study for an ecologist.

An almost unknown member of this section, which I saw only at Trapps Valley, in the vicinity of Grahamstown, is *E. latifrons*. It occurs in the open grass velt and the plants are widely separated from one another, half a mile or more apart. The leaflet is jagged, like that of *E. horridus*, but the trunks are stouter and the cones several times larger. The growth is even slower than in *Dioon edule*. Two plants, about one meter in height, on a lawn at Trapps Valley, have been under observation for nearly fifty years, and I was assured that they always bore leaves, sometimes new leaves, but that they were no taller than when first set out.

One object of the trip was to secure material for a complete morphological study of the five oriental genera. Through the generous cooperation of directors of botanical gardens and local botanists, this object was attained in far greater measure than I had dared to hope.

Even a morphologist should know his material in the field, and so I made careful observations and notes on all the species I could find. One result of the field study was not anticipated. From a field study of the Mexican genera, I had begun to regard the species of cycads as rather rigid. Of the four western genera, *Dioon, Ceratozamia* and *Micrōcycas* are monotypic or nearly so; *Zamia,* with its thirty or more species, would probably show considerable variation if one could study it from Florida to Chili. The *spiralis* section of *Macrozamia* in Australia and the three sections of *Encephalartos* in Africa show that some cycads are still plastic and show variations which may be fluctuating or which may be mutations. Unfortunately, most cycads do not produce cones until they are from twenty to fifty years of age, and, consequently, one could not begin experimental work with much prospect of seeing results.

CHARLES J. CHAMBERLAIN
UNIVERSITY OF CHICAGO

TWENTY-FIRST ANNUAL MEETING OF THE SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION

THE regular annual meeting of the Society for the Promotion of Engineering Education was held in Minneapolis from June 24 to 26 inclusive. The principal sessions were held in the new Engineering Building of the University of Minnesota and in the West Hotel, the latter being a joint session with the American Water Works Association. A comprehensive series of papers was presented by

members and non-members covering many of the important phases of engineering education and allied matters. Several of these took tangible form in committees appointed to carry out the suggestions presented in the papers. For example, a paper by Professor E. V. Huntington, of Harvard University, on "The Units of Force" was partly instrumental in causing the appointment of a Committee on the Teaching of Mechanics to Engineering Students. In another paper Mr. D. M. Wright, of the Henry & Wright Mfg. Co., suggested the appointment of a committee to study and report upon the standardization of technical terms. This suggestion was carried out.

The presidential address of Professor Wm. T. Magruder, of The Ohio State University, was devoted to the qualifications required in a good instructor. He pictured an ideal instructor as one who knows his subject but is also in mental reach of his students; who has the highest reputation for honesty, right living, patience and sound character; who is in practical touch with the subjects he has to teach and who has unbounded enthusiasm for the work of both teacher and engineer.

Other important papers treated of the construction of buildings for technical schools, instruction in highway and in hydraulic engineering, in shopwork and in drawing. The general subject of academic efficiency was discussed by Professor H. S. Person, director of the Amos Tuck School of Dartmouth College. President A. C. Humphreys, of the Stevens Institute of Technology, and Professor G. F. Swain, of Harvard University, championed the four-year as against the courses requiring five years or longer, while the opposition was led by Professor F. H. Constant of the University of Minnesota. The results of the operation of the systematic grading system in use at the University of Missouri were described by Professor A. L. Hyde. Professor F. P. McKibben, of Lehigh University, called attention to the advantages of summer work for engineering students and explained how his students arrange for such work. A very interesting session was devoted to engineering college shop practise and engineering drawing. Professor J. V. Martenis and Mr. W. H. Richards described how shop work is made attractive and stimulating to the students by making the exercises lead to something definite. An extensive exhibit was used to illustrate the working out of the plan. Professor T. E. French, of The Ohio State University, a most successful teacher of engineering drawing, showed how this subject can be taught effectively. Among other papers one by Professors C. E. Sherman and R. K. Schlafly, of The Ohio State University, described a novel practise of sending civil engineering students into commercial work during the summer under the direction of instructors if the students could not obtain regular summer employment. Professor H. Wade Hibbard, of the University of Missouri, presented directions for thesis work and gave a long list of subjects suitable for investigation. Mr. Ivy L. Lee, executive assistant, the Pennsylvania R. R. Co., gave some excellent suggestions from the employers of technical graduates to the teachers, indicating how the latter can exert helpful influences in the right direction. These suggestions were well received and provoked considerable discussion. In addition to the papers there were committee and officers' reports, all of which showed the society to be in good condition and alive to its opportunities.

A number of social functions and excursions increased the pleasures of the meeting and enabled the members to meet the faculty of the University of Minnesota and their families and to appreciate the remarkable beauty of the country around Minneapolis.

The following members were elected to serve for one or more years in the positions indicated: *President,* G. C. Anthony, Tufts College, Mass. *Vice-presidents,* H. S. Jacoby, Ithaca, N. Y., and D. C. Humphreys, Lexington, Va. *Secretary,* H. H. Norris, Ithaca, N. Y. *Treasurer,* W. O. Wiley, New York, N. Y. *Councillors,* H. W. Tyler, Boston, Mass.; J. F. Hayford, Evanston, Ill.; A. S. Langsdorf, St. Louis, Mo.; S. M. Woodward, Iowa City, Iowa; M. S. Ketchum, Boulder, Colo.; F. P. Spalding, Columbia, Mo., and P. F. Walker, Lawrence, Kans.

President Magruder made the following important committee appointments, carrying out the instructions of the society: *Joint Committee on Engineering Education,* G. C. Anthony, A. N. Talbot; *Committee on Teaching Mechanics to Engineering Students,* E. R. Maurer (chairman), L. M. Hoskins, S. M. Woodward, C. E. Fuller, L. A. Martin, Jr., Wm. Kent, S. A. Moss, Albert Kingsbury, H. F. Moore; *Committee on Teaching Physics to Engineering Students,* D. C. Miller (chairman), G. V. Wendell, J. M. Jameson, W. S. Franklin, H. M. Raymond, O. M. Stewart, E. P. Hyde, G. A. Goodenough, F. K. Richtmyer; *Committee on Standardization of Technical Nomenclature,* J. J. Flather (chairman), W. D. Ennis, S. C. Earle, F. N. Raymond, D. M. Wright; *Committee on Statistics,* A. J. Wood (chairman), F. A. Barnes, F. A. Fish, J. D. Phillips, H. H. Stoek.