to have a close look at some palms—in this case, those mentioned in the letter. We found in the canyon beyond the bay palmettoes that are surely *Sabal uresana*, and an *Erythea* that grew not only by the watercourse but even on one or two of the high rocky ridges. The palms of both genera are mature specimens. The erytheas on the ridge and those down below had identical inflorescences and fruits, very close in appearance to *Erythea armata*.

From San Francisco Bay we made fast time back to San Diego, stopping over one night in Hermosillo and another in a dry wash not far south of the border. All in all we had a wonderful trip and were fortunate to have seen such a variety of palms on this one tour. For brevity's sake I have left out two-thirds of the story, which as you can well guess would include no small number of incidents and experiences, some of them for the worse but most of them for the better.

Notes on the Hardiness of Palms on the French Riviera

David Barry, Jr.

During the early years of the present century an ardent grower of palms, A. Robertson-Proschowsky, introduced a great many species to his villa at Nice. He recorded his experiences in the *Bulletin de la Societé Nationale d' Acclimatation de France*, in an issue of 1906, and again in 1916.

The introduction of palms from the tropics to the semi-tropics is engaging the time and interest of many of our members. Robertson-Proschowsky's extensive work may serve to guide them in this activity.

The climate of the French Riviera is warmer in summer, and colder in winter, than that of the coastal plain of Southern California. During the winter the cold mistrals blow down from the clearly visible white peaks of the French Alps. In many ways, the climate of the Riviera is also comparable to that of much of Florida, which is visited from time to time by "northers."

Robertson-Proschowsky did not consider that his villa at Nice was especially sheltered when compared to other places on the Riviera. He stated that the climate was milder elsewhere, such as at Menton-Garavan, where a *Caryota* reached 16 feet in height and eventually ended a normal life span with its last and lowest inflorescence. Other milder places were named as Eze, Beaulieu, Villefranche, and Monte Carlo. As an encouragement to die-hards, those palm enthusiasts who will not take "no" for an answer, he cited the case of a specimen of *Cocos nucifera* that lived in the open at Eze for a dozen years.

The experiments of this grower began before the date of his first article in 1906 and extended beyond the date of his second article in 1916. During that period he did not experience the occasional great freeze that is catastrophic in effect upon growers. It came later with the intense cold of 1918 which nullified

many of his findings and brought snow, the weight of which not only broke the fronds of his lovely palms, but also his heart.

We should salute a notable palmateer, a dedicated man, and one who worked ardently and intelligently in the days of slow communication. The tropical palms that he so hopefully exposed, in so many cases to certain death, were first grown under glass, and were probably bought in many instances from continental nurserymen at good prices.

Before his lengthy writings become buried further in obscurity and the labor of his love lost with the passing of time, the gist of his experience is set forth for quick reference in the following tabulation.

[Editorial note. The list that follows uses nomenclature that is often outdated. The correct name of today is indicated in brackets when different. Fatal temperatures, first in degrees Centigrade, then in degrees Fahrenheit, and Mr. Robertson-Proschowsky's remarks, if any, follow in parentheses.]

Acanthophoenix crinita (3°C, 37.4°F).

Acanthorrhiza aculeata [*Cryosophila nana*] *and A. Warscewiczii* [*C. Warscewiczii*] (0°C, 32°F).

Acrocomia sclerocarpa (−4° C, 24.8°F, withstood −2° C, 29.4° F for several years).

Archontophoenix Alexandrae and *A. Cunninghamiana* (−5° C, 23° F).

Areca glandiformis (0° C, 32° F).

A. triandra (−2° to −3° C, 29.4°-26.6° F).

Arenga Engleri (perfectly hardy).

Arecastrum Romanzoffianum (−5° C, 23° F).

Astrocaryum aculeatum (0° C, 32° F); *A. Ayri* [*A. aculeatissimum*] (0° C, 32° F); *A. mexicanum* (reported hardy at Santa Barbara, California).

Attalea Cohune [*Orbignya Cohune*] (3°C, 37.4°F); *A macrocarpa* [?] (0°C, 32°F, without development at this temperature; "languishing"); *A. spectabilis* [*Orbignya spectabilis*] (−4°C, 24.6°F).

Bactris major (0°C, 32° F).

Borassus flabellifer (0°C, 32°F, perhaps would exist in sheltered places).

Brahea calcarea, B. dulcis (very hardy but of slow growth).

Butia spp. (very hardy).

Calamus spp. (3°C, 37.4°F, several species failed at this temperature).

Calyptrogyne Ghiesbreghtiana (0°C, 32°F).

Caryota urens (−2°C, 29.4°F); *C. Cumingii* (not hardy); *C. mitis* (not hardy); *C. ochlandra* (resisted freezes for 3 years and later died); *C. Rumphiana* (only one year's experience with this species).

Ceroxylon andicola [*C. alpinum*] (found to withstand the climate of San Remo, Italy).

Chamaedorea spp. (all the 15 species tried to prosper in semi-shade).

Chamaerops (hardy as a genus).

Chrysalidocarpus lutescens (1°-2° C, 33.8°-35.6°F).

Clinostigma Mooreanum [*Lepidorrhachis Mooreana*] (hardy).

Copernicia australis [*C. alba*] (perfectly hardy); *C. Miraguama* [*Coccothrinax Miraguama*] (0°C, 32°F, no growth after this temperature); *C. tectorum* (a plant from Venezuela of three meters appeared very resistent and vigorous).

Corypha elata (−2° to −3°C, 29.4°-26.6°F); *C. umbraculifera* (0°C, 32°F).

Cyphokentia gracilis [*Basselinia gracilis*] (−3°C, 26.6°F).

Cyrtostachys Renda (2°-3°C, 35.6°-37.4°F).

Daemonorops spp. (0°C, 32°F, half-dozen species tried).

Didymosperma porphyrocarpum [*Arenga porphyrocarpa*] (hardy to −3° to −5°C, 26.6°-23°F).

Diplothemium caudescens [*Polyandrococos caudescens*] (withstood −3°C, 26°F).

Dypsis pinnatifrons [?] (3°C, 27.4°F).

Elaeis guineensis (0°C, 32°F).

Eremospatha Hookeri (3°C, 37.4°F).

Erythea armata, E. Brandegeei, E. edulis, E. elegans (hardy).

Eugeissona triste (1°C, 33.8°F).

Euterpe edulis (−2°C, 29.4°F); *E. oleracea* (3°C, 37.4°F).

Geonoma gracilis [*G. Riedeliana*] (hardy for several years. Finally lost during a rigorous winter).

Howeia Forsteriana (hardy); *H. Belmoreana* (somewhat less hardy).

Hydriastele Wendlandiana (0°C, 32°F).

Hyophorbe amaricaulis [*Mascarena lagenicaulis*]; *H. indica; H. Verschaffeltii* [*Mascarena Verschaffeltii*] (2°C, 35.6°F).

Juania australis (−2° to −3°C, 29.4°-26.6°F).

Jubaea spectabilis [*J. chilensis*] (next to *Trachycarpus excelsa* [*T. Fortunei*] perhaps the hardiest of all palms).

Latania Commersonii [*L. borbonica*]; *L. Loddigesii; L. Verschaffeltii* (3°C, 37.4°F).

Licuala horrida [*L. spinosa*] 3°C, 37.4°F).

Livistona australis (−5° to −6°C, 23° to 22.8°F); *L. Mariae* (very hardy); *L. chinensis* (−4° to −5°C, 24.8° to 23°F); *L. cochinchinensis* (−3°C, 26.6°F); *L. Jenkinsiana, L. rotundifolia* (very hardy).

Mauritia armata (−2° to −3°C, 29.4° to 26.6°F); *M. flexuosa* (0°C, 32°F).

Metroxylon laeve (5°C, 41°F).

Phytelephas Poeppigiana [*P. macrocarpa?*] (0°C, 32°F).

Pinanga Kuhlii (5°C, 41°F).

Pritchardia Gaudichaudii (−3°C, 26.6° F).

Pseudophoenix Sargentii (withstood −2° to −3°C, 29.4° to 26.6°F, finally dying).

Ptychosperma elegans (withstood 0°C, 32°F).

Raphia Ruffia; R. taedigera (3°C, 37.4°F).

Ravenea Hildebrandtii (resisted −3°C, 26.6°F).

Rhapidophyllum hystrix (very hardy).

Rhapis flabelliformis [*R. excelsa*]; *R. humilis* (very hardy).

Rhopalostylis Baueri (hardy to at least −6°C, 21.2°F); *R. sapida* (hardy to at least −5°C, 23°F).

Roystonea spp. (0°C, 32°F).

Nannorrhops Ritcheana (will take −10° C, 14°F).

Nenga Wendlandiana [*N. pumila*] (0°C, 32°F).

Nephrosperma Vanhoutteanum (3°C, 37.4°F).

Normanbya Muelleri [*N. Normanbyi*] 0°C, 32°F).

Oenocarpus Bacaba (0°C, 32°F).

Oncosperma spp. (2°C, 35.6°F).

Orania philippinensis (0°C, 32°F).

Phloga nodifera [?] (−1°C, 30.2°F).

Phoenix canariensis; *P. dactylifera* (stated to withstand −7°C to −9°C): *Phoenix* spp. (as a group will withstand −3°C to −5°C).

Sabal spp. (hardy as a genus).

Saguerus saccharifera [*Arenga pinnata*] (0°C, 32°F).

Scheelea regia (resisted one winter around 0°C, 32°F).

Serenoa arborescens, S. serrulata [*S. repens*] (very hardy).

Stevensonia grandiflora [*Phoenicophorium Borsigianum*] (3°C, 37.4°F).

Syagrus insignis, S. Weddelliana (withstood −3°C, 26.6°F without damage).
Thrinax spp. (all species failed to live).
Trachycarpus excelsa [*T. Fortunei*] (the hardiest palm known; resisted −15°C, 5°F, in Paris); *T. Martiana* (perhaps less hardy than *T. excelsa*).
Trithrinax brasiliensis; *T. campestris* (very hardy).
Washingtonia filifera, W. robusta (very hardy).
Wallichia caryotoides (−1°C to −2°C, 30.2°-28.4°F).

Palms at the Jardin Botanique "Les Cedres," France

J. MARNIER-LAPOSTOLLE

The Botanical Garden "Les Cedres" is located on the French Riviera near Nice, France. It is a private garden, consisting of about thirty-five acres, founded by my father in 1922. There are over twelve thousand different species of plants represented in the garden, and it is particularly rich in cacti and succulent euphorbias, Araliaceae, Araceae, bromeliads, aloes, and agaves.

The palms are scattered over most of the garden but they are for the most part located in the warmest places, for we have severe winters about every twenty years when the temperature falls to 21.2°F (−6°C) and can cause heavy losses. The winter of 1956 was particularly severe. On the whole, the trees withstood cold fairly well. They are, however, more resistant when they reach an age of twelve to twenty years. We protect the rare species either by putting them under a light plastic cover or straw mats. The suckering palms, if frozen down to the ground, will spring up again.

Although a number of palms were planted many years ago and have reached good size, the collection was begun in earnest only a few years ago. As a result, many specimens in the collection are still small. I personally believe that many more palm trees could be introduced and acclimatized on the French Riviera than we already have. But they grow very slowly and it is very difficult to obtain them except by growing them from seed. In this area most palms are slow growing and it may take fifty to sixty years for some species to become adults.

Nearly a hundred and fifty species of palms are represented in our garden. We have a specially good collection of *Chamaedorea* consisting of twenty-six named species and several unnamed ones. Only twenty-four of our palm species produce seed for us. They are the following: *Archontophoenix Cunninghamiana, Arecastrum Romanzoffianum, Butia capitata, B. eriospatha, Chamaedorea Ernesti-Augusti, C. cataractarum, C. oblongata, C.* species, *Chamaerops humilis, C. humilis* var. *macrocarpa, Erythea armata, E. edulis, Livistona australis, L. chinensis, Phoenix canariensis, P. canariensis* var. *glauca, P. reclinata, Rhapidophyllum hystrix, Sabal Etonia, S. minor, S. Palmetto, S. texana, Trachycarpus Fortunei, Washingtonia filifera, W. robusta.*

These species can be considered as hardy here. In addition to these, others which have survived the cold of 1956 with little or no injury are the following: *Arenga Engleri, Brahea Berlandieri,*