report in some detail upon such a remarkable and conspicuous element of the flora. León, not to refute Columbus, excludes it from the native flora of Cuba, calling it "cultivado y naturalizado" (*Flora de Cuba* 1; 246. 1946); and Bomhard, in the U. S. D. A. publication intended for popular consumption "Palm Trees in the United States," says of the coconut palms in Florida, "Although some of them appear to be native, the coconut was introduced there long ago . . ." Mowry, nevertheless, in "Native and Exotic Palms of Florida," fell in with what Cook believed to be popular fallacy, on two counts: by including it with the native palms and by stating that it was "probably started by nuts washed ashore." Quite significantly Dahlgren, in the 1936 edition of "Index of American Palms," gives *Cocos nucifera* no quarter as an American palm and assigns it to the Old World tropics. In contradistinction to the word "native," few would deny that the palm is at least seemingly spontaneous and now naturalized in various southern sectors of the Florida mainland and on the Keys, though whether or not it could maintain itself there indefinitely in the complete absence of humans must remain matter for speculation since it is not susceptible of proof.

* * *

Received ideas meant very little to O. F. Cook. He flouted them whenever they conflicted with his own convictions, which was not seldom. He erected new palm genera and species whenever and however he saw fit, without the least concern for their chances of being accepted by his fellow scientists—and was sometimes called a "splitter" for his pains. The Palmae constituted not just one family, but many, and his insistence was in no way inhibited by the refusal of his colleagues to agree. Botanical science, however, did not entirely ignore him; one example was his new genus *Paurotis* which finally supplanted *Acoelorraphe* with many if not all palm students. One thing stands out above all others in Cook's botanical writings, namely, that in matters botanical he was a rugged individualist. It was congenitally impossible for him to be a rubber stamp, even when defiance of the established order could gain him nothing. His exploring mind may have sometimes led him along paths that seem wrong-headed, but one need not subscribe in any particular to his published conclusions in order to admire him for having been his own man. The audacity of intellects like Cook's is a stimulant, and his greatest contribution may have been to cause others to re-examine their comfortably held ideas without, certainly, loss to themselves and almost as certainly with profit.

The Ecuadorian Relative of the Chilean Wine Palm

David Barry, Jr.

Quito is a mountain city of 9200 feet elevation, and the capital of Ecuador. A common palm there is *Parajubaea cocoides*. The name signifies a cocoid palm like a *Jubaea*, referring, of course, to *Jubaea chilensis* (*J. spectabilis*) from Chile, a palm that has been a horticultural subject in Southern California and the European Rivieras for about a century. Except for seedlings recently in-

70. *Parajubaea cocoides* in Plaza de la Independencia, Quito, Ecuador.

troduced into California, the Ecuadorian palm does not appear to be grown outside of its native country.

There are many of these palms in Quito. It is widely planted in parks, plazas and private yards. In going from airport to city the palm becomes quickly evident.

It is interesting to speculate upon the failure in the past to introduce such a prominent and beautiful plant to the temperate zone. Seeds are available from the abundant production of the palms in Quito. They ripen in August. The illustrating photograph was taken in the spring when the large bunches of seeds hung well out of reach and with no tendency to fall.

The importance of this palm to horticulture is twofold. First, it is an elegant species. The trunk is more slender than that of its Chilean relative, and it is surmounted by a gloriously graceful crown. Second, it should possess a high degree of resistance to cold. According to temperature ranges of Quito in *New Horizons*, the compendium of travel information published by Pan American Airways, during the year the low temperature ranges from 44° to 47° F., 24.4° to 26° C.; the high from 69° to 72° F., 38.3° to 40° C., and the temperature averages 55° F., 30.5° C., during ten months of the year, and 56° F., 31° C. for two months. From these figures it is evident that this species can probably thrive where the nights are cool during much of the year.

The critical factor in the resistance to cold of many plants from warm countries is often the ability to withstand continued coolness at night rather than

a short but sharp drop in temperature.

The African relative of the Chilean wine palm, *Jubaeopsis caffra* (*Principes*, 1:180.1957; 3:103.1959), is a trunkless species of multiple crowns, and is about as hardy as *Howeia* and *Archontophoenix*. The Chilean species is one of the hardiest of palms.

Early Development of the Oil Palm Seedling

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In the first of a most welcome series of papers on the morphology of palms, Tomlinson (5) has followed the work of Gatin and classified palm seedlings into a number of types on the basis of seed and seedling structure and mode of germination. The main features of the classification are tabulated below.

At the West African Institute for Oil Palm Research, work on the germination of seeds of the oil palm, *Elaeis guineensis* Jacq., has been in progress for a number of years. The physiology of germination has been discussed fully by Hussey (1, 2) and Rees (3, 4) and will not be enlarged upon here. It was thought that a brief description of the oil palm seed and early seedling development would prove of interest and serve as a basis for discussing the position of the oil palm in Gatin's classification.

Germination and the early development of the seedling is illustrated in the accompanying figure. The oil palm embryo is short and straight or very nearly so, although it does become curved following germination, apparently due to the growth of the plumule (fig. 71, D). The distal end of the embryo produces a well developed persistent radicle. It is produced later than the plumular projection, although its early growth is more rapid. Development of adventitious roots is extremely regular just above the clearly demarcated radicle-hypocotyl junction (fig. 71, H). The ligule is cylindrical, well developed (fig. 71, H, I) and persistent, although it undergoes some marginal tearing with increased growth of the seedling. Two bladeless sheaths are produced before a leaf with a green blade appears.

The fact that the seedling develops very close to the seed apparently excludes the oil palm from Gatin's types A and B which are characterized by a well developed cotyledonary petiole and sheath. In group C, as exemplified by *Archontophoenix*, the embryo is curved, and the narrow radicle which has a restricted growth is soon replaced by a wide lateral root. Superficially the oil palm resembles type C as there is no elongation of cotyledonary petiole and

Type	Embryo	Plumule & Radicle	Persistence of Radicle	Petiole & Sheath
A	straight	along main axis	persistent	elongates, eligulate
B	straight	oblique	persistent	elongates, ligulate
C	curved	oblique	non-persistent	no elongation, ligulate

Table 1. Characteristics of the three types of palm germination.