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SCIENTIFIC PAPERS.

THE LITERATURE OF FURCRAEA WITH A SYNOPSIS OF THE KNOWN SPECIES.*

BY J. R. DRUMMOND.

FURCRAEA GEMINISPINA, Jacobi.

The type of this, as Dr. Trelease has remarked, was a single specimen seen at Kew about October, 1865,† by General von Jacobi, which had not flowered, but was otherwise well developed (Versuch, Sep. Abdr. p. 282). Jacobi also referred to this type certain young plants in the Berlin Botanic Garden, which had been received through a Herr Meyerhoff from St. Domingo; and he further stated his belief that the species was identical with the second variety of "*F. tuberosa*, Willdenow" (*i. e.* *Agave tuberosa* of Sp. Pl. ed. 1799, ii. i. 194). Willdenow, however, merely cites the Hortus Kewensis (1789) which gives under *Agave* two species referable to the modern genus *Furcraea*, viz. 5, *A. tuberosa* and 6, *A. foetida*. No. 6 is manifestly intended for the plant described (in 1793) as *Furcraea gigantea* by Ventenat, but we do not know whether

* The following epitome of our present knowledge of the genus *Furcraea* has been prepared in connection with an investigation undertaken at Kew by Mr. Drummond, last year, to account for the types of certain species ascribed to the Kew Gardens concerning which I had inquired, and is of such general interest that, with the accompanying illustrations, it is published with the concurrence of Colonel Prain, the Director of the Royal Botanic Gardens at Kew, who as well as Mr. Drummond has long been interested in the genera *Furcraea* and *Agave*.—w. r.

† For this date and other assistance the writer desires to thank Mr. S. A. Skan of the Kew Herbarium.

the plant grown at Hampton Court in 1690 was in fact the plant of Ventenat. As regards no. 5, the text of the Hortus Kewensis is as follows:—

“ 5. *A. caulescens*, foliis dentato-spinosis.

α spinis solitariis. *Agave tuberosa*. Mill. dict. Single-spined tuberous-rooted Agave.

β spinis duplicibus. Double-spined tuberous-rooted Agave. Nat. of America. Cult. 1739, by Mr. Ph. Miller. Rand. Chel. Aloe 34.”

A note is added that this species and the one preceding it there (*Agave lurida*) are doubtful, the fruit being unknown. In the 1811 edition of the Hortus Kewensis (ii. 302–303) these two species are reproduced under *Furcraea*, with a slightly expanded synonymy, but the former note is expunged, and a fresh observation is inserted, relating solely to *F. tuberosa* and stating that the flowers of *F. tuberosa* are the size of the flowers of *F. gigantea*, and twice those of its congener, *Agave cubensis*, Jacq.

By 1811 therefore there were four *Furcraeas* known at Kew; but only two of these were actually cultivated in the garden, and those two were looked on as merely forms of a single variable species; thus,

1. *Furcraea gigantea*, Vent.
2. *Furcraea tuberosa*, Ait.*
3. *Furcraea tuberosa*, spinis duplicibus.*
4. *Furcraea* (*Agave*) *cubensis*, Jacq.

The next question is whether the *Agave vivipara* of Aiton represents a fifth *Furcraea*, as from the original Linnaean description should evidently be the case. In both editions of the Hortus Kewensis *Agave vivipara* is referred to Aloe no. 7 of the first edition of Miller's Gardeners' Dictionary, which Miller himself identified with *Aloe sobolifera* (of Hermann), a West Indian Eu-Agave, and most likely the same as *A. antillarum*, Descourtilz. If, as seems probable, the plant actually grown at Kew was Hermann's *Aloe sobolifera* then

* Represented in the garden.

the further citation of Willdenow's *Agave vivipara* was quite erroneous, because the specimen in Willdenow's Herbarium, which the writer has been enabled by the courtesy of the Berlin Museum Staff to inspect, is most plainly a *Furcraea*. The older botanists did not know that bulbils are produced by all, or almost all the species of Eu-Agave and *Furcraea*, so that every specimen which displayed this feature was referred to as "vivipara" with well nigh interminable confusion as the consequence. *Agave vivipara* of Miller's eighth edition was perhaps a *Furcraea*; it will be considered later. What "*Agave vivipara*" tab. 180 of the *Plantes Grasses* may represent, the writer is unable even to conjecture: it seems hardly to be either a *Furcraea* or an *Agave*.* *Agave vivipara* of Wight (Ic. 2024) is an Eu-Agave, for which Col. Prain and the writer in a note † on the Agaveae naturalized in India have proposed the name of *Agave Wightii*; this appears to be a native of the Antilles and is quite distinct from the species recently in growth at Kew under the same name which is *Agave Cantala*, Roxb. (Rumpf, Herb. Amboin. v. t. 94) = *A. vivipara*, Baker in Gard. Chron. n. s. viii. (1877), p. 780, excl. all syn. but Wight, but not in Kew Bull. no. 39, March 1890, cxxxv.

Returning now to *Agave tuberosa*, it is evident that Miller's plant was the "Aloe americana tuberosa minor spinosa. Parad: Batav: Prod:" of the Hortus Amstelodamensis ii. Cap. xix. fig. 19, as indeed is expressly stated under Aloe 34 by Isaac Rand, in the Index Hort. Chels. 1739 (cited by Aiton), a rare work to which the writer has had access through the kindness of the authorities of the Natural History Branch of the British Museum. Miller makes no allusion to the "twin-spined" form of *tuberosa*, and an examination of both living and herbarium examples has convinced the writer that this feature is neither confined to any single species nor constant even in the individual. In *Furcraea tuberosa* the leaf margin is sharply indented, the rather close set prickles forming each

* Cf. however, Todaro, Hort. Panorm. ii. pp. 51-54, tt. xxxvii-xxxviii.

† Govt. of India Agricultural Ledger. 1906, no. 7. (Veg. Prod. Series no. 99.)

a horn to the intervening crescent-shaped indentation, but the breadth of the indentation varies widely, and sometimes, in the young state especially, the space which should intervene between adjacent prickles is suppressed more or less completely so that the bases of the prickles coalesce or approach each other closely; as Commelyn puts it in describing the leaves "eorum margines spinis viridibus nullo servato ordine armantur."

It is not so clear what is meant by the initial character "Radicem habet haec Aloe tuberosam una cum fibris rubicundam . . ." From the corresponding part of the description (Cap. xviii.) of "Aloe americana viridi rigidissimo et foetido folio piet dicta indigenis. Kiggelarii Hort: Beaum." it would seem as if the actual roots were "tuberous," but this is not borne out by the figures; and from Miller's text it appears that in his time, the "tuberous root" of the old authors was understood to have referred to the true stem or caudex. On the other hand Tussac, who had many opportunities for studying the plant which he deals with as *Furcraea gigantea* (Fl. des Antilles, 1818, vol. ii. pp. 101-103) in the living state in S. Domingo, says that it has "un faisceau de racines en partie tubéreuses et en partie fibreuses." His description plainly indicates *F. tuberosa*, Aiton: the plant grew "wild" in several cantons of the colony, and produced the "filasse qu'un homme pitte;" but Redouté's illustrations which accompany the text are exactly copied from nos. 126 and 126 (bis) of the *Plantes Grasses* (1799) to which is appended a description of *F. gigantea* taken, as De Candolle was careful to explain, from Ventenat. This figure differs materially from Redouté's no. 476 in vol. viii. of the "Liliacées," also styled *F. gigantea*, which agrees, though not perfectly, with Jacquin's colored figure of *Agave foetida* in *Ic. Pl. Rar. ii. t. 379*, and his description in the *Collectanea*, ii. 312. In all these figures, as in Commelyn's no. 18, the leaf-edges are devoid of prickles, whereas Ventenat (*Bull. de la Soc. Philomatique*, no. 28 Vendemiaire, an 2 de la Rép. — Oct. 1. 1793, republished in 1796 at pp. 54-60 of Usteri, *Annalen*, vol. xix) gives the leaves of *F. gigantea* as "dentato-spinosa, dentibus planis, raris. remotis, rubicundis."

There is a *Furcraea* naturalized in the Sibpur Botanic Garden which appeared to Col. Prain and the writer to be the true *gigantea* of Ventenat, and in this the leaf is sometimes quite devoid of margin prickles, sometimes there are "teeth" on one margin only, or a few weak "teeth" are present at the base of the leaf-blade somewhat as in Wight's Icon. 2025 which is named *F. gigantea*, but may represent a different species. The Calcutta plant appears to be represented at Kew by a few young specimens, but at the stage reached it is not easy to distinguish the true *gigantea* from the form described by Baker at 6543 Bot. Mag. as *F. cubensis*, Haw. var. *inermis*, which seems to be very like Redouté's picture in the Plantes Grasses of *F. gigantea*, repeated in Tussac's Flore des Antilles, as already stated, for what was really *F. tuberosa*, and again by Trattinick with a translation from the description in the "Liliacées" of the true *gigantea*.

The living plants of *F. cubensis* at Kew are rather young for satisfactory determination, but in the Herbarium there are specimens which the writer takes to represent the genuine *Agave cubensis* of Jacquin, notably no. 3250 of C. Wright's Plantae Cubenses. In this form the perianth is smaller and the germen shorter than in *F. gigantea*, agreeing with a sheet of *A. cubensis* from Jacquin's herbarium at the British Museum which consists unfortunately of a solitary flower, and with the dissection given at fig. 28, tab. clxxv. Sel. Stirp. Amer. (descr. at p. 100); the leaf is more gradually constricted above the base than in *gigantea*, and the margin prickles are more regularly set, and proportionally smaller than in *tuberosa*; they are slighter and less uncinat than in *F. Selloa*, to which, rather than to *F. cubensis*, we should probably refer *F. Lindeni*, if indeed this should not be looked on as a valid species. *F. cubensis* seems to be restricted to Cuba, in the islands at all events.

We have seen that Aiton's "*tuberosa spinis duplicibus*" was in all likelihood the equivalent of Tussac's plant from S. Domingo, but the Kew variety with simple spines remains to be accounted for.

In the Gardeners' Chronicle n. s. xi. (1879) p. 624, Mr.

Baker remarked that we have no published figure of *F. tuberosa*, Aiton. He might have said that there is no figure published or unpublished, except the original 19 of the Hortus Amstelodamensis, because the unpublished drawing sent to Kew by Fenzl mentioned by Mr. Baker does not belong to *F. tuberosa*: Mr. Baker himself subsequently referred this plant to *F. undulata*, Jacobi, but in any case it was clearly not *F. tuberosa*, Aiton. In the "Amaryllideae," p. 200, it is stated that no reliable specimens are available; but there is a sheet at Kew from the Goodenough Herbarium marked as "*Agave tuberosa*, Hort. Kew. genus novum," with the note "This flowered for the first time in Europe at Kew October and November, 1793," etc. Mr. Baker named it first "*Fourcroya tuberosa*, Ait. type," but corrected this in pencil afterwards to "*F. gigantea*, Ventenat." So far as the material goes, the writer cannot help thinking that the earlier determination was correct, and that we have here the type of Aiton's species, which is hard to distinguish in the dry state from some forms of *F. gigantea*, Vent. though the living plant should be readily distinguished.

Stress has been laid on the odor of the flowers, but the trivial name given by Linnaeus had no reference to that, but to the smell from the crushed leaves of *F. gigantea*, which in Calcutta specimens was most perceptible; as Commelyn says of *tuberosa*, "Caeterae, quas possidet qualitates, cum priore [*F. gigantea*] conveniunt, praeterquam quod haec Aloe non foeteat." Of the preceding (Cap. xviii.) he writes "Ipsis foliis succus quidam adhaeret viscosus & foetidus."

Boerhaave (Index Hort. Lugd. Bat. 1720) says of Hermann's plant, which is that of Commelyn's 18th chapter and figure, "Nascitur in Curaçao unde fila parantur sutoribus quae ibi Piet vocantes inde nomen dederunt plantae." Redouté in the "Liliacées" gives the home of *F. gigantea* as "Curaçao and S. Domingo;" the former rests no doubt on the Leyden Catalogues, and the latter may be safely traced to Tussac, but the species is wrongly given, for the S. Domingo plant described in the "Flore des Antilles," and afterwards received through Mr. Meyerhoff in the Berlin Garden, was,

the writer cannot doubt, *F. geminispina*, Jacobi, = *F. tuberosa*, Aiton.

Jacobi's type has doubtless meantime perished, but there is a plant now at Kew which answers unmistakably to the description of "*geminispina*," and this appears to the writer to be identical with a specimen in the Herbarium collected for the brothers Smith in the Island of Bequia (one of the Grenadines) south of St. Vincent. Both no doubt are the same as a *Furcraea* sent in 1892 by Mr. C. A. Barber from Antigua with an illustrative set of photographs, a brief description of the plant, and a drawing of the flower, which is at once distinguishable from its allies by the proportionately longer germen, a feature which is obvious in the Goodenough Herbarium type of *Furcraea tuberosa*. There are examples in the Kew Herbarium from Nevis and Grenada also.

The earliest mention of the Agaveae by any European writer occurs in a work published at Basle in 1533, where the "Maguey" of San Domingo is likened to a palm*, and the name is said to have signified, in the Haitian tongue, a drum or cymbal. Martius believed that the Haitian drums were made from sections of the scape of the Maguey, but however this may be there is every reason to suppose that the original Maguey was not any *Agave* at all but the *Furcraea* which our present information shows to be common, if not dominant, in several of the Leeward Islands group, and was brought to Berlin, as Jacobi states, from S. Domingo, his *geminispina* namely, *i. e.*, *F. tuberosa*, Aiton. None of the West Indian Agaves has a trunk except *A. Wightii*, which appears to have a different distribution, and in any case that has not the characteristic "palm-like" habit of *Furcraea tuberosa*.

It has been stated (Dr. K. Braun in "Pflanzer" no. 14, Sept. 29, 1906) that the earliest account of any *Agave* is that given by Oviedo, "Commandeur von St. Domingo," in the Hist. Gen. de las Ind. (Seville 1535) in which it is mentioned that the people of Araya are called Magueyes from the abundance of the Maguey plant in their country. Von Mar-

* Decades, Cologne, ed. 1574, p. 301, quoted by Martius.

tius (Beitrag zur Nat. and Lit. Gesch. der Agaveen, 1855, pp. 9-13) has discussed the early accounts very fully, pointing out that in Oviedo's earliest work (published 1526), and in the first edition of the "Coronica," (Seville 1535), there is no mention of the Maguey. Oviedo's notes on "Cabuya" and "Henequen" were promptly published, but Maguey remained in manuscript until 1851, when the uncompleted portion was first published by the Madrid Academy, and this has obviously helped to keep up the impression that our knowledge of the Agaveae and the name "Maguey" originated from the continent of America, whereas, even if the later date which the writer has adopted for Peter Martyr's mention* be taken, it is certain that the Maguey was first met with in the Islands. Martius observes that the dedication of the first "Decade" bears date October, 1516,—that is before the discovery of Mexico.

Oviedo speaks of the Maguey of the Antilles from his own knowledge; what he says of Araya and the Maguey of the mainland was from hearsay apparently. Araya is a port in what is now Venezuela, at the western extremity of a long narrow peninsula which, running parallel to the coast lying east of Cumana, forms the deep inlet marked in Keith Johnstone's Royal Atlas (1898) as the Gulf of Cariaco.

The "Maguey" Indians do not seem to be recorded in that neighborhood by modern writers, but a "Mangue" nation or confederacy was at one time in the ascendant in the country between Yucatan and the Northwestern Andes. It is shown by Don An. Alfaro (Boletin de la Sociedad Nac. de Agricultura [Costa Rica] no. 6, Aug. 25, 1906) that in 1529 Oviedo visited the Gulf of Nicoya (on the Pacific Coast of Costa Rica), where he witnessed (and afterwards described) the preparation of cordage from two plants, which he calls "Henequen" and "Cabuya," the Cabuya, from the descriptions, being evidently a *Furcraea*. Mr. T. A. Sprague, F.L.S., has most kindly placed at the writer's disposal his collection of works on

* Decades, of Peter Martyr (translated in Hakluyt's Voyages, 1598), Repr. Lond. 1812. Dec. iii. Cap. 7 [p. 289 Repr.] and Cap. 9 [p. 299 Repr.].

natural history, products, and travel in Colombia and the adjoining countries, from which it appears that Cabuya is the term commonly applied throughout that region to the species of *Furcraea*, but in parts of Colombia "Fique" is also used. The "Cocaiza," or "Maguey de Cocuy" (there are several other forms and spellings) of Venezuela is more doubtful; at Caracas and Cumana "Maguey de Cocuy" is expressly said on the authority of Humboldt (Nov. Gen. et Sp. i. p. 289, an. 1815) to be *Yucca acaulis*, HBK. which as Dr. Trelease has shown* was in reality a *Furcraea*.

Our information as to the Agaveae of South America is as yet imperfect. Specimens from the Cauca Valley (inland Colombia) of the local Cabuya seem to be *Furcraea gigantea*, and it was most likely the same plant which M. Ed. André found being worked up for cordage at Venta Quemada between Cartago and Naranjo ("L'Amérique Equinoctiale" in Tour de Monde, 1877, p. 116). Triana's specimen marked "Fique or Cabuya" from the mountains towards Bogota, about 9,000 feet above sea level, is an unknown species of *Furcraea*; whereas "Pita" in the Andes seems to be commonly reserved for one or more local species, probably not yet described, of *Agave*.

Matters have been complicated by the lax and shifting use in different parts of South and Central America and in the West Indian islands, of certain local or venacular expressions, e. g. "Silk-grass," "Karatas," "Keratto," "Caraguata," and "Istle" (often written, Spanish fashion, "Ixtli"). "Caraguata" ("Caroata," "Grawatha," or "Karuata") seems to be current chiefly in the upper Amazon and Orinoco basins, and applied originally perhaps, as it certainly does now, to various Bromeliaceae, but it has come to be attached, in the Antilles at least, to one or more of the *Furcraeas*. "Karatas" has a similar history, but in this case the application to a *Furcraea* has arisen perhaps from a compiler's blunder. "Keratto" (or "Coratoc") in the Western Antilles is unquestionably a yellow-blossomed Eu-Agave allied to

* Rept. Mo. Bot. Gard. xiii. 114. (1902).

A. antillarum, Descourtilz, if not actually that species, but this title also has been sometimes transferred to a *Furcraea*. "Istle" would take up a treatise almost by itself, but *Furcraea* seems, as a rule, to have escaped its visitations. In Jamaica "Silk-grass" (see Long, p. 814) meant,—or at all events included,—a true *Aloe* introduced through the Bermudas, as it was supposed, from Africa; in the Eastern Antilles it seems to denote *Furcraea tuberosa*.

In a Supplement to the Leeward Islands Gazette of the 20th July, 1893, Mr. C. A. Barber, F.L.S., reported on the "Silk-grass," "Silk-Dagger," or "Sweet Dagger" of which he had sent dried specimens in 1892 to Kew from Antigua (identified by the writer, as above explained, with *F. tuberosa*, Ait. fil.), and in this report the plant is noted as occurring also in St. Kitts, Montserrat, Nevis, and Dominica, but in the last, doubtfully indigenous; Mr. Barber had heard of it in Tortola (Virgin Islands), and thought that it probably extended to Barbuda also. These Antigua specimens were referred at Kew to *Furcraea gigantea*, Vent. var. *Willemetiana* (Roemer Syn. iv. p. 293) which is nothing but a book equivalent for the *Funium pitiferum* of Willemet ("Herbarium Mauriticanum" in Usteri, Annalen xviii. 1796), naturalized for the sake of its fiber in the Isle de France, and from the description should be *F. gigantea*, Vent. Roemer gives San Domingo as a chief habitat of his "*gigantea*" (type), so that he has evidently just inverted the geography, for the true *gigantea* is the mainland, not the island form. This was partly due, no doubt, to Ventenat's description which in part applies more precisely to *tuberosa* than to Commelyn's no. 18, but the rest of the account indicates the Curaçao species of the Dutch authors unequivocally. Very likely writers on the "Aloes vert" of the Mascarene Islands have at times confounded different introduced Agaveae; and *F. tuberosa* may have found its way to the Mauritius even in the time of Aublet, whose West Indian names belong primarily, so far as the writer knows, to *tuberosa*.

In 1891 Mr. Bovell sent to Kew from Barbados two sets of dried specimens of what seems to be a single species of *Fur-*

cræa; one set was said to have been "found growing in the Scotland District," the other was perhaps from a Botanic Station Garden. These were referred (as the Antigua plant was later) to "*F. gigantea* var. *Willemetiana*," but they seem to the writer to be referable to *F. tuberosa*; the indentation of the leaf-margin is obscured or obliterated, but from Mr. Barber's description (which includes a sketch of "intervals" on the leaf-edge) this seems to occur in *tuberosa*; in many Agaveae, indeed, such characters depend on the stage of individual development. In a British Museum copy of the Hortus Elthamensis (1732), which has colored illustrations, figure 21, tab. xix. of "*Aloe barbadensis* mitior, laete virens et splendens" is unmistakably intended, in the writer's view, for *Furcraea tuberosa*: the text also, which contrasts this sort of "Aloe" with "the common American" and the "Vera Cruz" kinds, fits *F. tuberosa* precisely, with the single exception that the plant of Dillenius is credited* with a brown "aculeus," (ultimately black), above the convolute and pungent leaf-tip, which, in leaves of *tuberosa* at their prime, is not ordinarily observable; in individuals there is not unfrequently an apparent spine, above the apparent leaf-tip, but this character in *Furcraea* generally is unsatisfactory, often transient, and of little moment. In the list of names prefixed to the issue with uncolored plates by Sherard, in which the Dillenian titles are reduced to Linnaean binomials, the plant, which was brought to England from Barbados by "Mr. Newport Merchant of London," is reduced to "*Agave americana*," though the letter-press ought to have precluded this confusion. Strictly speaking, this is an early figure of *F. tuberosa*, but as Commelyn's illustrations and the previous literature are ignored, it can hardly be said to conflict with the dictum above quoted; and the like applies to Gartenflora, i. (1852) Taf. iii. p. 21 (in O. Heer's article "Der Renton Garten in Funchal"), which though pretty certainly based on a specimen of *F. tuberosa* is named "*gigantea*" and referred by

* Owing, possibly, to confusion with "*Agave Morrisii*," the young leaves of which are not dissimilar.

Regel, following Roemer doubtless,—to var. *Willemetiana*. A modern figure in *Revue Horticole*, 1877, p. 234, which professes to be *F. tuberosa*, might be any of this group of species.

The distribution of this group seems to be approximately as follows:—

(a) *F. gigantea*, Vent., from Costa Rica to Northern Venezuela and again on the east coast of Brazil to about the 25th south parallel; S. E. Antilles, but doubtfully indigenous; inland Colombia (probably an introduction).

(b) *F. tuberosa*, Ait. fil., Haiti and Santo Domingo; Puerto Rico; Lesser Antilles (doubtfully indigenous).

(c) *F. cubensis*, Vent., Cuba; Yucatan (in cultivation).

There is a specimen in the Kew Herbarium from the Demerara Botanic Garden (Jenman no. 3887) marked at Kew "*F. gigantea* var. *Willemetiana*" which resembles one of Bovell's Barbados sets, and is probably cultivated *tuberosa*.

On the other hand *F. gigantea* is represented from the French Antilles, but it was brought there in the first place, the writer suspects, by human agency. Even in Colombia, in the south at least, the "Cabuya" has been probably brought from the Isthmus; at Popayan, above the head waters of the Cauca, it is expressly stated that the Cabuya, though abundant, has been planted. The headquarters of the genus lie evidently in the mountains sloping towards the Pacific coast from Oaxaca to Darien, and as pointed out by Mr. Hemsley (*Biol. Cent. Amer. Bot. App.*, p. 272) the *Furcraea* area extends to the southwards while the Agaves have their maximum development towards North America.

F. tuberosa as a spontaneous product seems to be restricted to the islands eastwards of Jamaica and north of Tobago (in Jamaica itself the genus seems to be entirely wanting except as an escape). It is probably the "[*Aloe*] eadem portoricensis foliis non foetidis minusque rigidis" [*i. e.* less than in *F. gigantea*] "*radice tuberosa, an Aloe americana radice tuberosa, non foetida P. B. Prodr.*" of the Hortus Beaumontianus (1690); but it may have been originally endemic in Hispaniola.

Seemann's "*tuberosa*" from the Isthmus was no doubt

gigantea; a specimen of his gathering at the British Museum marked "vulgo Cabuya, Panama" is, the writer thinks, true *gigantea*,—in any case it certainly is not *tuberosa*; this is probably the same as no. 973 of p. 216, Botany Voy. of the Herald, "on the slopes of the volcano of Chiriqui, Veraguas, but also cultivated to a considerable extent on account of its fibre . . ."

F. gigantea is recorded from several of the small islands fringing the gulfs of Panama, of Darien, and of Maracaybo, from the Magdalena littoral and the delta of the Orinoco; but for Trinidad the writer has little information, while Tobago has a *Furcraea* literature of its own, as follows.

In 1648 Jan de Laet edited a work of Willem Piso on Brazilian Medicine and in this (De Medic. Lib. iv. p. 112 et fig. ad. rect. lat. p. 111) is described a Brazilian Caraguata distinguished as "Caraguata magna" or "Caraguata guaçu" [i. e. "Karwata assu" or giant Karwata]. From the description this was manifestly a *Furcraea*, but in the woodcut the flowers are erroneously drawn with but five segments, and later authors who relied on this to fill out their matter have described the "corolla" as five-petalled accordingly. This work of Piso's is prefixed to the posthumous *Historia Rerum Naturalium Brasiliae* of Georg Maregraf of Liepstad* in which (Lib. ii. pp. 87-88) the following kinds of Caraguata are distinguished (besides the true Aloe which had been discussed in a former chapter), viz. (1) Caraguata growing on tree trunks, etc., probably a *Bromelia* or *Karatas*; (2) Caraguata-guaçu, also a Bromeliad, possibly an *Aechmea*; (3) Caraguata açanga, the Penguin (*Bromelia Pinguin*, Linn.); but to this De Laet appended an account borrowed from Ximenes' edition of Hernandez' four books on the medicinal products of New Spain (1615) of sundry kinds of "Metl," and also a rude figure taken from a sketch, provided by a friend who had lived in Tobago, of a plant which De Laet supposed to be the same as the "Nequametl" of the Spanish author. From the woodcut in Hernandez (Ed. Nardo Recchi, "Nov.

* Near Dresden in Saxony: he called himself "Misnicus" i. e., of Meissen.

Thesaurus, etc.," 1654, p. 273) of Nequametl it is clear that De Laet was in error, for that was probably an *Agave* of the *Littaea* section, and in any case remote from the Tobago species which, if anything, resembles Todaro's *Furcraea elegans*.

In his 1658 edition of Piso, De Laet gave in all five Caraguatas, viz:—

(i) Caraguata açanga which is *Bromelia Pinguin*, Linn.; (ii) Caraguata guaçu, by description evidently Marcgraf's plant of the same name, which was a Bromeliad, but the corresponding figure is the Caraguata-guaçu of Piso (de Medicinis) *i. e.* a *Furcraea*; (iii) the "Erva babosa" of the Portuguese and a true *Aloe*; (v) by the description should be a *Karatas* of the *Nidularium* group in that genus; while (iv) reproduced Marcgraf's figure of his original Caraguata-guaçu, with a brief description differing from Marcgraf's which, as just seen, had been transferred to Piso's Caraguata guaçu. It is not easy to trace the original Caraguata guaçu (*i. e.* Marcgraf's) but it may refer to the *Tillandsia augusta* of Velloso (Fl. Flum. iii. t. 135, 1827) cited doubtfully by Martius (Fl. Bras. iii. pt. iii. pp. 568-569, tab. 105) for his *Vriesia imperialis*, E. Morr. ined., and identified by Baker (Journ. Bot. 1879, p. 162) with his own *Aechmea augusta*, which, however, seems to be a separate though perhaps closely allied form (*cf.* also Gaudichaud, Voy. Bonite, 63).

Linnaeus, in the Hortus Cliffortianus (1737), p. 130, cited "Marcgraf, Bras. 87" for his "Aloe foliis lanceolatis dentatis spinosis spinâ cartilaginea terminatis radicalibus" which for the rest is the *Agave americana* of the Species Plantarum. He was thinking possibly of *Agave antillarum*.

Labat (Nouv. Voy. aux Isles, etc., 1724, pt. 4, chap. xvi. p. 115) gives a long account of "Karatas," largely based, though without acknowledgment, on De Laet's description of the Caraguata-guaçu, but the figure of Karatas (reduced from Piso's Caraguata açanga) opposite p. 135 of the first part is *Bromelia Pinguin*, Linn.; opposite p. 69, however, of part 4, there is an artistic reproduction of De Laet's Tobago "Nequametl" entitled "Aloes ou espèce de Karatas qui a fait son

jet et fleury dont on fait le Tol;" finally he says the leaves of the Karatas yield an excellent substitute for soap. So far as the French Antilles were concerned this no doubt refers to *Furcraea tuberosa*, or *F. gigantea*, and *Agave antillarum*, the points taken from the Jamaican Penguin and the Tobago "Nequametl" being literary embellishments; but unfortunately Jacquin, in the *Sel. Stirp. Am.* (p. 100), quoted Marcgraf's Nequametl as a synonym of his *Agave cubensis*, and this, taken with Labat's story, which was given currency by Martius (under "*Fourcroya cubensis*" l. c. p. 189), has led to the perfectly erroneous supposition that *Furcraea cubensis* is diffused in the Lower Antilles and the northern parts of South America. Labat's errors were not altogether original, for Du Tertre (*Hist. des Antilles*, ii. 106, quoted by Koster, *Travels in Brazil*, App. p. 482), had the same legend of the Karatas though in a rather simpler form. Martius seems to have been influenced by the "Dissertação sobre as plantas que podem dar linhos, etc." (1810, pp. 23-26) of Arruda da Camara, who describes the "Caroata assu" or "Piteira" and identifies it with "*Agave vivipara*;" but whether the Linnaean species is meant, or some other, is not evident. It may be doubted whether the author had before him any actual plant, and was not merely dealing with the Caraguata guaçu of the early writers. Local botanists should be able to discover what De Laet's Tobago drawing represents; it could hardly have been *Furcraea cubensis* or *F. gigantea*: and considerable interest attaches to the identity of the Agaveae of this island, with regard to its geographical position.

It has been suggested that *F. gigantea* is not really separable from *tuberosa*, but the plants at their prime appear to be readily distinguishable in the living state, though it is not easy to find tangible book characters; they differ in habit, in the outline of the leaf, and by the perianth; the odor of the crushed leaf cannot always be observed, and but little weight attaches to the leaf margin as between them. It has been stated that *F. gigantea* has a stem, while *tuberosa* is comparatively stemless: this character, as with several other Agaveae, is of slight value, but in point of fact old plants of *tuberosa*

seem in most cases to develop a stout, often twisted or partly decumbent, caudex up to five feet long or more. *F. Lindenii* has a usually straighter, somewhat slighter trunk, with more numerous leaves, arranged in a more symmetrical and closer spiral; the leaf is rather narrower in proportion to its length, stiffer, with the margin firmer and prickles less irregular; the under surface of the leaf moreover is rougher; the inflorescence is not known to the writer and in its absence *Lindenii* seems doubtfully distinct from *Selloa*. *F. gigantea*, *tuberosa* and *Selloa* are perfectly distinct from *F. cubensis*, which should probably be placed in a group by itself and apart from the "Giganteae." The confusion has been increased by Jacobi's having cited *F. tuberosa*, Ait. β under *F. cubensis*, although he had already quoted for his "*gemini-spina*" (*i. e. tuberosa*) "Willdenow Sp. Plant. p. 194," which is merely a quotation from the first edition of the Hortus Kewensis, concerning the second sort of "*Agave tuberosa*." Jacobi notes that he had never seen a plant answering to Jacquin's description of *Agave cubensis*, unless perhaps one in an Exhibition at Amsterdam, and that, from the description, does not seem to have been really *Furcraea cubensis* which, as accurately said by Jacquin, has the leaf margin "ciliato-spinose" as against "dentato-spinose" in the language of the older botanists. The leaf of the true *cubensis* is distinct in color, texture, thickness, outline and by the margin from all known *Furcraeas* but the doubtful "*albispina*," being more like that of certain Eu-Agaves, notably the young state of *Agave Wightii*, Drummond and Prain (see p. 27 above). When our notes on the naturalized Agaveae of the East Indies were sent to the press we had not seen Wright's Cuban specimens, or Barber's Antigua *tuberosa*, so that references in that memoir to *Furcraea cubensis*, and *F. Commelyni* must be taken accordingly; it seems possible that some of the "Mauritius hemp" now grown in the Mascarenes and in S. India is really *Furcraea tuberosa*.

About twenty species of *Furcraea* have received names of varying authority, but of this number only about ten can be said to be established, and of these *F. elegans*, Hort. Panorm.

i. p. 13, t. 4, is known solely from the figure and description of Todaro, but is given a place among the admitted species for reasons stated in the subjoined provisional classification, to which is appended a key to the group of "Giganteae." In this scheme an "x" in brackets is placed against those species that are understood to be represented now at Kew by living examples.

The synonymy, which is often both obscure and intricate, is not given under the species but is dealt with by itself; and notes are given on imperfectly known species, also names to be excluded.

CONSPECTUS.

Furcraea, Ventenat in Bull. Soc. Philomat. no. 28 (Oct. 1793), reprinted in Usteri Ann. xix. (1796) pp. 54-60; Haworth, Syn. (1812) p. 73; Baker, *Amaryllideae* (1888) p. 198; Baillon, *Hist. des Plantes* (1894) xiii. p. 64.

Furcroea A. P. De Candolle (after 1806), *Plantes Grasses* no. 126; Ait. fil. in *Hort. Kew.* ed. 2 (1818) p. 302; *Bot. Mag.* 2250 (1821); Benth. & Hook. fil., *Gen. Pl.* (1883) iii. 739; Hemsley, *Biolog. Cent. Amer.* (1884) iii. 352.*

Furcroya Rafinesque-Schmaltz, *Somiolog.* (1814) p. 31; Endlicher, *Gen.* (1837) i. 181.

Fourcroya, Sprengel, *Anleitung* ed. 2 (1817) pt. ii. p. 238; Zuccarini in *Nova Acta Acad. Leop. Car.* xvi. (1833) pt. ii. 664; Herbert, *Amaryllidaceae* (1837), 57, 69, & 126-7; M. J. Roemer, *Syn.* (1847) iv. 21, 292; Ft. zu Salm-Dyck in *Bonplandia* vii. (1859) pp. 85-87; Jacobi, "Versuch etc." in *Hamb. Zeit.* xxi. (1864); Baker in *Gard. Chron.* (1879) i. 623.

Fourcroea Haworth, *Supplem.* (1819) p. 42.

Funium, Willemet, *Herb. Maurit.* in *Usteri Ann.* (1796) xviii. p. 26.

Roelia, *Hort.* (non Regel).

SECT. I. SERRULATAE.

Leaf margins closely set with minute teeth; trunk conspicuous, sometimes arborescent.—Subgenus *ROEZLIA*, Baker in *Amaryllideae*, 1888, p. 199.

1. *F. longaeva*, Karwinski & Zuccarini in *Nova Acta Acad.*

* Tab. 89-92 of the *Biologia* belong to *Dioscorea*, and not, as stated by a clerical error in Baill., *l. c.*, to *Furcraea*.

Leop. Car. (1833) xvi. 2, 666, t. 48; Bot. Mag. 5519 (1865) (*Fourcroya*).

HAB. Among oak and arbutus thickets on the slopes of Mt. Tanga, Oaxaca, Cent. America, about 10,000 ft. above sea, Baron Karwinski; lofty ridges in Guatemala, Skinner, f. Bateman in "Orchidaceae" (1843) letter press to tab. xvi. (*Brasavola glauca*), with vignette illustration; near Sorata on Illampu, Andes of Bolivia, alt. 9,000 ft. above sea, Mandon no. 1192 in Hb. Kew. (perhaps an undescribed species closely allied to *longaeva*).

2. F. Bedinghausi, K. Koch in Wochenschrift (1863) vi. 234; Belg. Horticole, 1863, pp. 327-330 with figure; Bot. Mag. 7170 (1891) (*Fourcroya*). [x]

HAB. Mt. Acasca near the city of Mexico, Roezl 1860, f. Bot. Mag. l. c.; Pedregal, Pringle no. 6801; Sierra de Pachuca, do. 6991, both in Hb. Kew.; Serrania de Ajusco, do. 6669 (ident. not quite certain) in Herb. Kew.!

SECT. II. SPINOSAE.

Leaf margin armed with conspicuous more or less distant prickles (prickles occasionally few or obsolete); trunk under six feet high, often undeveloped.—Subgenus *FURCRAEA* proper, Baker l. c.

GROUP A. MINORES.*

Mature leaf less than forty inches long; scape (with panicle) fifteen feet or under.

3. F. undulata, Jacobi in Abhandl. Schles. Gesellsch. 1869, p. 170; Bot. Mag. 6160 (1875) (*Fourcroya*). [x]

HAB. unknown; Jacobi conjectured it might have been collected (for Verschaffelt) by Ghiesbrecht in Chiapas or Tabasco (Eastern Mexico); "Bermuda" f. Hort. W. Bull. (1878) in Herb. Kew.!.; New Providence Island (Bahamas) vern. "Manilla," Eggers no. 4194 (ident. doubt.) in Hb. Kew.!

4. F. albispina, Hort. Panorm. ex Baker in Gard. Chron. (1893) xiv. p. 584.

* Cf. Jacobi, Nachtrag p. 174 sub *F. Aitoni* ("e minoribus congenerum").

HAB. unknown; a doubtful plant, the leaf margin somewhat recalling that of *F. cubensis*, Vent., but the perianth lobes longer in proportion.

GROUP B. GIGANTEAE.

Mature leaf more than forty inches long; scape (panicle included) fifteen feet high and over (attaining 30 feet).

5. *F. cubensis*, Ventenat in Bull. Soc. Philomat. Vendemiaire an 2 de la Rép. (= 1 Oct., 1793).

HAB. Cuba: elsewhere probably introduced. C. Wright Pl. Cub. no. 3250!; ex Hb. Jacquin. in Hb. Mus. Brit. (flower only!); Hb. Morales, f. Canizares, Flora Cubana (Habana 1901); Cienfuegos, Prov. Santa Clara no. 297, R. Combs in Trans. Acad. St. Louis, vii. 470; "vern. cajun, Cajun Maya, near Sisal, [Yucatan] cult.", Schott no. 809 in Hb. Mus. Brit. (ident. not positive!); vern. cahum-ci, Yucatan f. E. Mairaux* in "Revue Américaine" (Brussels) 15 April, 1904; vern. "Manila", East Caicos Island, f. Kew. Bull. 1890, pp. 274-276 (ident. doubtful).

6. *F. tuberosa*, Ait. fil. in Hort. Kew. ed. 2 (1811) ii. 303. [x]

HAB. S. Domingo, Tussac Fl. des Antilles (1818), ii. pp. 101-103 (desc. in French of *tuberosa*, with fig. of "*F. gigantea*, Vent." copied from De Candolle, Hist. Pl. Succul. no. 126, and name "*gigantea*"); also Meyerhoff, f. Jacobi, Versuch, etc. (Sep. Abdr. 1864-67), p. 282, sub "*geminispina*"; Puerto Rico (v. P. Hermann in Par. Bat. Prodr. 1688, sub. tit. "*Aloe americana*, etc. . . . portoricensis"; also Sintenis no. 482, A. A. Heller et conj. no. 317 (both flowers only and ident. doubtful) in Herb. Kew.!; Virgin Islands, R. H. Schomburgk ex Martius (Beitrag, etc., p. 42) sub nom. "*Agave americana*" (?); Tortola (?) C. A. Barber; St. Christopher, Barber; Nevis, J. Briggs in Hb. Kew.!; Montserrat, Barber; Antigua, Barber!; Dominica (? introduced), Barber; St. Vincent (sub nom. *F. gigantea* var. *Willemetiana*) Kew Bull.

* The writer is not aware whether this is original or based on Schott's (or Perrine's) reports.

1892, p. 101; Bequia (Grenadines), Smith brothers in Hb. Kew.!; Grenada, Sir Hely Hutchinson in Hb. Kew.!; Barbados, J. D. Bovell, Hb. Kew.! Cult. in Hort. Kew. 1793, ex Hb. Goodenough. in Hb. Kew., also Mus. Brit.!

7. F. gigantea, Ventenat in Bull. Soc. Philomat. 1793, and Usteri Ann. xix. pp. 54–60; Bot. Mag. 2250 (1821) (*Furcroea*); Belg. Horticole 1860, p. 219, pl. 34. [x]

HAB. Costa Rica, vern. “cabuya” Oviedo (1529)?; Do. 5 vern. “cabuya olancho,” Biolley in Boletin Soc. Nac. de Agricultura [Costa Rica] no. 5, 10 Aug., 1906, pp. 74–81 with fig.; Chiriqui volcano in Panama, Seemann, Voy. “Herald” p. 216, no. 973 (sub nom. *F. tuberosa*, Ait.); also cult. in prov. Veraguas (ident. not certain); “Panama v. 842 vulgo cabuya,” Seemann in Hb. Mus. Brit.!; Isle of Cacagual, Darien, Seemann, Voy. “Herald” p. 216, no. 972; La Paila [upper Cauca] Holton, Fl. Neogranadina-Caucana no. 149 in Hb. Kew.!; Curaçao, Boerhaave in Ind. Alt. Pl. Hort. Lugd. Bat. (1720) ii. 129; Isles de Salut, French Guiana (1854), sub nom. “*Agave vivipara*” Sagot no. 557 in Hb. Kew.!; Trinidad, Fendler no. 852 in Hb. Kew. (ident. doubtful!); Martinique, Hahn no. 1122, in Hb. Kew. & Hb. Mus. Brit.! also Duss, “Fl. Phan. des Antilles Franç.” in Ann. de l’Inst. Col. de Marseille iii. (1896) 558–9, no. 3602 (not seen); Guadeloupe in hedges, etc., Duss (l. c. no. 2125, not seen).

INTRODUCED, Isle de France (sub nom. “*Agave foetida* = *Aloes vert*”), Aublet, Fl. de Guiane, etc. i. 305; loc. incert. Hb. Willdenow. in Mus. Berlin sub nom. “*Agave vivipara*”!; Mascarene Islands, with printed ticket “Fl. Maur. ii. no. 373” (and named “*Aloe viridis*,” in MS.) in Hb. Kew.!; Mauritius, ex Hb. Bojer. in Hb. Kew. (“*Agave vivipara*”)! Ayres no. 26 (type of Baker Fl. Mauritius, p. 367), also Ayres (bis) “hills above Port Louis, very common throughout the islands,” both in Hb. Kew.!; Central Madagascar, Baron no. 2302, 1993 (?), 2638 (?) in Hb. Kew.!; Seychelles, E. P. Wright in Hb. Mus. Brit. (flowers only, ident. & loc. doubt.!); Sibpur (Calcutta Bot. Gard.) 1904–5!!; also (flowers only, ident. & loc. doubt.), “Jamaica,” Morris, also Hart no. 1534 (probably in either case from a garden).

8. *F. elegans*, Todaro,* Hort. Pan. i. p. 13, t. 4 (1875) (*Fourcroya*).

HAB. unknown; cf. Tobago, Eggers no. 5706 (flowers only, ident. doubtful) in Herb. Kew.! The sketch of a Tobago plant given to De Laet by a friend which De Laet erroneously identified with the Nequametl of Hernandez (see above, p. 37), resembles Todaro's figure of *F. elegans* more than any other species; Jacquin, who evidently had not seen the woodcut in the "Thesaurus," thought presumably that the margin prickles were exaggerated in the sketch, but it seems unlikely that the true *F. cubensis* should be found in Tobago. If the sketch is at all faithful, then the only species that answers it is this of Todaro; but see also *F. stricta* (under imperfectly known species).

9. *F. Selloa*, K. Koch in Wochenschrift 3 (19 Jan. 1860), p. 22; Bot. Mag. 6148 (1875) (*Fourcroya*). [x]

HAB. unknown. The original type had not flowered, and there is nothing to show whence it came to Sans-souci (Potsdam): K. Koch conjectured that it was introduced by von Warszewicz from Guatemala, and the original home is given by Jacobi as "volcano of Quassaltinanga in Guatemala," but this seems to require verification. The only herbarium specimens at Kew are from cultivation in England.

10 *F. macrophylla*, Hook. fil. in Ic. Plant. t. 2501 (1897.) [x]

HAB. Riofrio, cult., no. 1951 comm. Kalbreyer (in 1881), with name "*Agave vivipara* var. ?" and the remark "fiber of the leaf very much used for making sacks, bags, slippers, packsaddles, etc.;" Bahamas, Eggers, nos. 4194, 4399, 4400a (1888) in Hb. Kew.!: old quarry near Nassau, New Providence (Bahamas) Curtiss no. 127 in Hb. Kew.!: received from Hart, Trinidad, 1889; in Hb. Kew. (loc. doubt.)!

This well marked form appears to be so far unknown except in cultivation or as an escape; but it is by no means restricted, as it has been said to be, to the Bahamas, and its home, if it occurs in a wild state at all, is most likely on the

* Represented at Kew by plants from Palermo, which are still too young for determination or description.

mainland towards the Isthmus or in the southeast parts of Central America. The only Riofrio shown in European maps of South America is in North Chile.

KEY TO THE SPECIES OF GROUP B "GIGANTEAE."

Margin prickles of mature leaf less than two lines long, little curved, spreading. *cubensis*.

Margin prickles of mature leaf more than two lines long, strongly uncinata, ascending.

Leaf at greatest width fairly broad in proportion to its length. (about 1 : 8 or more).

Leaf oblong-lanceolate, germen longer than the perianth lobes; juice of leaves not fetid. *tuberosa*.

Leaf obovate-lanceolate, germen equalling or shorter than the perianth lobes; juice of leaf fetid. *gigantea*.

Leaf at greatest width narrow in proportion to its length, (about 1 : 10 or less).

Margin prickles approximate (0-1 in. apart).

Neck of leaf gradually narrowed to about 3 in. at the narrowest part. *elegans*.

Neck of leaf constricted to about 2 in. at the narrowest part. *Selloa*.

Margin prickles distant (1-4 in. apart). *macrophylla*.

SPECIES NON SATIS NOTAE.

F. AGAVEPHYLLA, Brotero ex Schultes Syst. Veg. vii. (i.) 731 (1829).

The paper in which this was propounded is shown in the records of the Linnaean Society as received from Felix D'Avellar Brotero on the 30th of January, and read the 8th March, 1823; it seems to have been made over to the referee, but not printed, and no evidence of its contents is apparently procurable beyond the notice in Schultes, to whom presumably a copy of the author's MS. was accessible. The plant is said to have been found in Maranhao, Pernambuco, and other parts of the Brazils, and can hardly have been Jacquin's Cuban "*Agave*" (*F. cubensis*, Vent.); indeed Schultes himself (pt. ii. p. 1717) suggested ultimately that it might be rather "*Agave vivipara*" of Arruda da Camara, above cited. It is doubtful how far Arruda's "*Caroata assu*" represents

any actual *Furcraea*, but if he was acquainted with a Pernambuco species, known to the Indians as a "Caroata", that may very well have been Brotero's plant, and possibly the same as Piso's original Caraguata-guaçu (not Maregraf's), and also De Laet's Tobago drawing, which, taken with Jacquin's citation of "Nequametl, Maregraf," is no doubt responsible for the identification of Brotero's plant with Jacquin's. The proper citation,—if De Laet's sketch was to be identified with *Agave cubensis*, Jacquin,—would have been "Nequametl, De Laet, non Ximenes vel Hernandez in Recchi," but in all probability De Laet's so-called Nequametl, if the sketch be worth anything, was quite different from the Cuban species (see also *F. elegans* above).

F. AITONI, Jacobi in Abhandl. Schles. Gesellsch. 1869, p. 174.

The description of the leaf, as Dr. Trelease has observed, recalls the *F. gigantea* of Bot. Mag. 2250, but Jacobi clearly referred his *Aitoni* to the neighbourhood of *undulata* (*i. e.* the "Minores" of this paper). No trace exists at Kew, and unless there are authentic specimens on the continent of Europe, *F. Aitoni* is never likely to be identified.

F. ASPERA, M. J. Roemer Syn. iv. p. 293 (1847) = *Agave aspera*, Jacq. in Enum. Vindob. App. 307.*

Jacquin was careful to distinguish this from his "*hexapetala*" (Enum. Syst. Plant. 1760, p. 18), which is *Furcraea cubensis*, Vent., and observed that in habit it was like a small edition of *Agave foetida*, L., *i. e.* *F. gigantea*, Vent.; the flowers were altogether those of "*hexapetala*": by this however he did not mean to contrast them with those of *F. gigantea*, but with the type of *Agave* as we now regard it in contradistinc-

* In the same year that the second edition of the "Enum. syst. stirpium quae in Ins. Carib. etc." issued, Jacquin published the "Enum. stirp. plerarumque . . . in agro Vindobon. etc." with which there were printed and continuously paged, under a common title page, "Observationum Centuria" (on certain plants of Mid-Europe), "Appendix de paucis exoticis," and at the end copperplate engravings to illustrate the "Observationum Centuria." *Agave aspera* is dealt with in the "Appendix."

tion to *Furcraea*. See further *F. Commelyni* and *F. spinosa*, below. Whatever "*aspera*" may have been it certainly was not *F. cubensis*, Vent.

F. ATROVIRIDIS, Jacobi & Goeppert in Otto, Hamb. Zeit. xxii. (1866), p. 328.

Baker (Amaryll. p. 199) reduced this to *F. gigantea*, Vent., but Jacobi gives reasons for distinguishing "*atroviridis*."

There is a plant at Kew which may be distinct from either *gigantea* or *tuberosa*, and answers fairly to Jacobi's marks for *atroviridis*, so that pending further information the name had better be kept up provisionally.

The "*F. viridis*" of Index Kewensis ii. 984 is based on the citation of a synonym in the Biologia Centr. Amer., and relates to *F. atroviridis*, Jacobi & Goeppert.

F. BARILLETI, Jacobi in Abhandl. Schles. Gesellsch. 1869, p. 166.

Apparently a garden variation of *gigantea* or *tuberosa*, and unless authentic specimens can be produced for examination the name should be abandoned.

F. COMMELYNI, Kunth Enum. v. 842.

This is the *Agave Commelini* of Salm-Dyck in "Annotationes Botanicae" to the "Hortus Dyckensis," (1834), p. 301, which was expressly referred by that author to t. 19, vol. iii. of the Hortus Amstelodamensis (*i. e.* *F. tuberosa* Ait. in the writer's view); but Jacobi, who had seen the original specimen at Schloss Dyck, pointed out certain differences, and the probability seems to be that it was really *gigantea*, unless indeed it was the "*flavoviridis*" of Hooker in Bot. Mag. 5163 (1860). The succulent collection of the Dyck Garden was dispersed after the demise of its founder; a few descendants are preserved of certain species, but the writer could not trace "*A. Commelini*"* among them.

* In the "Annotationes" it was proposed to restrict *Furcraea* to the single species *longaeva*, Zuccarini.

The next question is whether the plant of Salm-Dyck was that described in the "Amaryllideae" p. 200 (1888) by Baker. The descriptions do not altogether tally, and there is no specimen of the leaf in the Kew Herbarium; so far as the text goes, the plant of the "Amaryllideae" might be true *gigantea*, Vent., but perhaps we should find it rather in the "*F. cubensis* var. *inermis*" of Bot. Mag. 6543 (1881). There are flowers in the Herbarium on which Mr. Baker has written, "*F. Comelyinii* Hort. Kew. Sept. 1874 is *F. gigantea* small variety," and these correspond to flowers belonging to a spray from a *Furcraea* which poled in the garden during 1859-60 while they differ somewhat from all those examples which the writer has been able to refer to *gigantea*, *tuberosa* or *cubensis*. The plant which flowered in 1859 was attributed in the first instance to *F. gigantea*, but a later hand has substituted "*F. flavoviridis*," from misapprehension possibly of a passage under Bot. Mag. 5163, where Sir W. Hooker remarks that "*flavoviridis*" might have been referred, but for the absence of a "tuberous" stem, to *F. tuberosa* and adds "We have plants that have not yet flowered which . . . better correspond with *F. tuberosa* and I am bound to consider a new species, which Mr. Répper sent, twelve or fourteen years ago, . . . from Real del Monte. It may be considered a *F. gigantea* in miniature; the flowers however being quite as large and of the same structure as *F. gigantea* already given in Bot. Mag. tab. 2250."

The concluding sentence manifestly refers to *F. flavoviridis*, though the flowers in the figure are about twice the size of those of *F. gigantea*, corresponding to examples, probably abnormal, that exist in the Herbarium; but one way or another it is evident that the *Furcraea* of Bot. Mag. 5163 has been more or less confused with the plant that flowered in 1859, which the writer thinks must have been the same as Bot. Mag. 6543 ("*F. cubensis* var. *inermis*").

It seems further possible that "*inermis*" is the plant figured by Redouté for the *Plantes Grasses* and Tussac's *Flore des Antilles* as *F. gigantea*. Although superficially resembling *gigantea*, the plant of Bot. Mag. 6543 will in all likelihood

prove perfectly distinct, and if finally established must receive a fresh name as it probably is not the "*Commelini*" of Salm-Dyck, and is certainly distinct from no. 19 of the Hort. Amstelodamensis. It is very difficult to say now what the types at Dyck of "*F. gigantea*" and "*F. tuberosa*" may have been, and on those depends the identity of *F. Commelyni*, Kunth, for Jacobi's "*tuberosa*" is the Dyck plant, and his views on "*gigantea*" were based largely on Salm Dyck's; of "*gigantea*" he had never seen a flowering specimen, and his description, in so far as it is original, indicates "*cubensis* var. *inermis*" of Baker rather than the true *gigantea*. It must be remembered that the "*cubensis*" of Salm-Dyck and Jacobi was not Ventenat's *cubensis*. The former supposed the plant of Jacquin to be the var. β of Aiton's *tuberosa*, which is "*geminispina*" of Jacobi,—the Dyck "*tuberosa*" from the description being somewhat different; what it may have been must be left for the present, but it could hardly have been genuine *tuberosa*, Ait. fil. in any case. Jacobi's *tuberosa*, so far as the leaves go, was taken from the Dyck "*tuberosa*" but the inflorescence was described from a different example, which Jacobi afterwards propounded (Abhandl. Schles. Gesellsch. 1869, pp. 168, 169) as a distinct species named "*F. lipsiensis*." In the synonymy under *F. Commelyni*, no. 19 of the Hort. Amstelod. is given by Jacobi as equivalent to *A. Commelini* of Salm-Dyck, but in the text he argues that Salm-Dyck was mistaken on this head, and that Commelyn's no. 19 should rather be identified with *F. tuberosa*, Ait. Under *F. cubensis* he cites *F. tuberosa*, Ait. var. β though he had already quoted "Willdenow Sp. Pl. p. 194, *F. tuberosa* β spinis duplicibus" for his own "*geminispina*"; whereas Willdenow's "*Agave tuberosa*" is avowedly a mere extract from Aiton, the sole species known to Willdenow himself having been the plant named in his Herbarium "*Agave vivipara*" which, so far as can be judged, was *F. gigantea*, Ventenat. The fact is that *F. cubensis* was, and evidently is still, rare in collections, and but scantily represented by dried specimens, if indeed in the older herbaria there were any specimens at all.

The true *gigantea* also probably is seldom reared in Europe,

the cause being doubtless that it wants a moister atmosphere than is usually accorded to the Agaveae, as known xerophytes, in our houses; and the same applies, though not quite so fully, to the real *tuberosa* of the Hortus Kewensis. If "*inermis*" (Bot. Mag. 6543) was the plant collected in the mountains south of the city of Mexico by Repper, it would be accustomed to a very different climate from the coasts of the Isthmus and of South America, but it seems identical with a plant of Fendler's (no. 1548 in Hb. Kew.) from Tovar in the interior of Venezuela.

It follows from the above that "*F. Commelyni*," both of Kunth and of Baker, must be dropped altogether, and when the so-called "*var. inermis* of *cubensis*" can be properly described a distinctive name must be found for it. The "*cubensis*" contemplated in Bot. Mag. 6543 was not Jacquin's plant at all, but one of Haworth's creations (for which see the Synonymy below). In the Amaryllideae Baker cites the type from Goodenough's Herbarium of *F. tuberosa*, Ait. fil. for his "*gigantea*" (p. 199), and distinguishes "*gigantea*" by the trunk reaching 3-4 feet in length, so that his "*gigantea*" must be taken as in part at least equal to Aiton's *tuberosa*, though in part the true no. 18 of Commelyn. His "*cubensis*" similarly is in part, by the description, Jacquin's *Agave cubensis*, but the leaf is manifestly rather that of *F. Selloa*, specimens of which are often marked in gardens "*F. cubensis*." Mr. Baker says distinctly that he had no reliable specimens of *tuberosa*, and took his description from Jacobi and Hasskarl (Retzia, ii. p. 16, d. 1856); but Hasskarl's description was from a plant received from Sydney which flowered at Buitenzorg, and was evidently *F. gigantea*, Vent. The "*tuberosa*" of Salm-Dyck and (in part) of Jacobi will be considered further under *F. spinosa*.

The writer would have liked to give complete descriptions of each of the species in this group, but hesitates to attempt this without full grown living specimens before him. For the following provisional description of the Antigua plant he is largely indebted to Mr. Barber's notes and photographs already mentioned. By kind permission of the Director of the Royal Gardens certain of these photographs, and others

from the Herbarium, are reproduced to illustrate this memorandum.

F. tuberosa, Ait. fil. in Hort. Kew. ed. 2, ii. 303.—*Trunk* in young plants inconspicuous, in old examples 3-6 ft. long, often decumbent, sometimes partly twisted, 5-10 in. thick, succulent within. *Leaves* about 40 in a somewhat loose tuft, almost upright, or ascending, but when old reflexed, splitting, smooth on both sides, bright green, oblong-lanceolate, typically, at 2 in. from the base, 6 in. broad, narrowed to 5 in. at 8 in. above it; at their greatest width, that is about the middle of the leaf ($3\frac{1}{2}$ ft. from the base), about $10\frac{1}{2}$ in.; about $6\frac{1}{2}$ feet long but attaining 8 feet and upwards; margins to 10 in. from the base flat, free from prickles, or with minute retrorse teeth, which increase upwards, at the middle more or less irregularly set at intervals of 0-1 in. with reddish-brown prickles up to $\frac{3}{8}$ in. high, arising from a thickened projection of the leaf-border, uncinatè; bases of the prickles sometimes geminate by suppression of the margin-interval, which is normally deeply indented but in old leaves nearly straight; margin more or less involute above the middle of the leaf, ultimately forming a groove one to three inches deep, devoid of prickles in the uppermost fourteen to eighteen inches; tip convolute into a blunt scarcely pungent conical acumen.* *Scape* 15-25 feet high, the often dense oblong thyrsoïdal panicle reaching ten feet or more; perianth-lobes about $1\frac{1}{6}$ inch \times 7 lines, greenish-white without, white bordered, shorter than the germen which attains $1\frac{1}{2}$ in.; capsule oblong-ovate; bulbils usually numerous, broadest at the base, sharp pointed.

F. CUBENSIS, Haw. var. **INERMIS**, Baker in Bot. Mag. 6543 (1881) (*Fourcroya*). [x]

See the preceding. The *F. cubensis* of Haworth (Syn. p. 73) is not the same as *F. cubensis* of Ventenat; it is true

* In young leaves the tip of the leaf is often hardened into a false spine and disarticulates; in old leaves the acumen is very often shod, as it were, with a blunt horny callus. In no *Furcraea*, so far as the writer's knowledge goes, is there ever a true fibrous terminal spine such as is manifest in many other *Agaveae*.

that he quotes "Willd. Sp. Pl. 2. 193" and that the plant indicated by this reference is the *Agave cubensis* of Jacquin, but he further cites *F. tuberosa* β of the second edition of the Hortus Kewensis, which is a different species altogether, with the result that in England "*F. cubensis*" has been usually applied to a plant which approaches *tuberosa*, certainly, but is probably in fact *F. Selloa*, K. Koch, and in any case is not the Cuban species of Jacquin. There is no proof that Mr. Baker's plant is derived from any of the established species; it may be the *Agave aspera* of Jacquin (Enum. Vin-dob. App. 307), and the "*F. gigantea*" of the figure (but not the letterpress which is taken from Ventenat) in the Plantes Grasses 126 bis, repeated in the Flore des Antilles of Tussac (ii. 25, 26) for the San Domingo plant which is actually *F. tuberosa*, Ait.

F. DEMOULINIANA,* Jacobi in Hamb. Zeit. xxiii. (1867), p. 310.

Not now apparently in cultivation; supposed to have been brought from Mexico by Galeotti; the description reads like that of a monstrosity, but the large bulbils recall Triana's specimen from the Colombian Andes previously mentioned.

F. DEPAUPERATA, Jacobi in Hamb. Zeit. xxii. (1866), p. 411.

Based on a single specimen. Possibly identical with Baker's *albispina*, but it is particularly unsafe in this genus to identify plants from descriptions solely without living specimens or at least reliable herbarium material.

F. FLAVOVIRIDIS, Hook. in Bot. Mag. 5163 (Feb. 1860) (*Fourcroya*).

The writer cannot separate this from *F. Selloa* of the Kew Garden and Herbarium except by the very large flowers in one specimen which agree with the illustration but are probably abnormal, and by the generally small proportions of the flowering plant; it is hardly safe, however, to rely on the pro-

* There are young plants received at Kew under this name but they are altogether doubtful.

portions of a *Furcraea* when it has poled in a garden, unless these prove constant over several generations; even then, as Mr. Baker has well pointed out, it would not be advisable to lay stress on the dwarf condition unless other characters accompany.

The original "*Selloa*" of K. Koch has only a few days precedence of "*flavoviridis*," and was founded on a plant (that had not flowered) at Sans-souci, but the name is well established as attaching to the form recognized at Kew as *Selloa*, and on the whole the best course seems to be to treat "*flavoviridis*" for the present as a synonym of *F. Selloa*, until fresh examination can be made of flowering examples. To complete the matter, *Selloa* and "*flavoviridis*" should also be compared with "*Lindeni*." It is not impossible that the Dyck "*tuberosa*" may have been "*flavoviridis*"; the native country is not really known in either case, for the mention under Bot. Mag. 5163 of Repper's Mexican collections does not relate to "*flavoviridis*" but to a different plant which may have been the same as "*cubensis* var. *inermis*" of Baker (see *F. Commelyni*).

"*F. GIGANTEA*," Wettstein Veg. Bild. Sud. Brazil (1906) pl. iv. (non Ventenat).

This name is attached to a *Furcraea* which figures in an illustration from a water color sketch by F. von Kerner of the "Edge of the Savanna in the dry season near Itapetininga," a place in São Paulo, in southeast Brazil, about 25° S. Lat.

It can hardly be *F. gigantea*, Vent., and may be an undescribed species.

F. LINDENI, Ed. André in Ill. Hort. xxi. (1874) pl. 186, p. 167. (*Fourcroya*). [x]

M. André cites Jacobi "in Linden Catalogue," and notes that the plant was brought to Linden in 1868 from near Cali in the Cauca valley of Colombia (see also "Tour de Monde" xxxiv. 1875-6, p. 133), where it existed in small quantity. It may be doubted whether this handsome plant has not, like *Agave americana* var. *variegata*, a cultivated origin, and so

far as the leaves go it is very near *F. Selloa*, but until the inflorescence can be studied, it is better to retain it as a species. The earliest mention of the plant appears to be in the Gardeners' Chronicle, 1869, p. 587, as having been shown by Linden at the Russian International Horticultural Exhibition of that year. The writer has unfortunately not succeeded in tracing Jacobi's description. Lehmann no. 8676, on cliffs at 1000–1800 meters round Popayan, may be this. The leaves (probably from the inner part of the tuft), are not variegated;—they resemble those of *Lindeni* or *Selloa* but have not the “emery paper” under-surface; the flowers are too small for *F. Selloa* of the Kew Herbarium.

F. PUBESCENS, Todaro “Sopra una nuova sp. di Fourcroya” (1879), pp. 9–14.

From the figure this can hardly be the “*pubescens*” of Baker in Bot. Mag. 7250 (1892) which is the same as *F. undulata*, Jacobi, assuming at least that the *undulata* of Bot. Mag. 6160 (1875) represents Jacobi's species, which seems to the writer practically certain. The degree of pubescence evidently varies in these dwarf *Furcraeas* within somewhat wide limits; it is remarkable that they share this character, which is altogether absent in the “*Giganteae*,” with the arborescent “*Serrulatae*.”

From Todaro's description, and the representation of a stem-leaf on pl. ii. (fig. 5, omitted in the explanation), *F. pubescens* would appear to differ from all known *Furcraeas* by the remarkable arrangement of the leaves which extend to the scape, and, though modified in shape, only disappear at the base of the first branch of the panicle.

F. SPINOSA, Targioni-Tozzetti in Obs. Bot. dec. i. & ii. (1808) pp. 33–36, tab. iv. fig. 1–16, 27, 28, & 32 = Rodati, Ind. Hort. Bot. Bonon. (acc. Obs. de Agaves spec.) p. 27, t. 1.

On the whole this would seem to have been *F. tuberosa*, and if this were demonstrable “*F. spinosa*,” as the name, would have priority; but the figures indicate a shorter, rather narrow leaf, and may represent a plant collected at Sta.

Martha in Colombia by Purdie of which specimens are extant in the Kew Herbarium. *F. spinosa* was grown by the Botanical Society of Florence under the wrong name of "*Agave virginica*"; being thence transplanted in 1783, several plants in different gardens flowered in 1796, 1799, and 1807, and have been described by Targioni-Tozzetti who has identified them with the "*Agave*" of Rodati's memoir above quoted which is undated, but was published, from internal evidence, after 1797. This might be the "*tuberosa*" of the Dyck garden, or even possibly, though less probably, the *stricta* of Jacobi; there remains "*flavoviridis*," but the probabilities are all in favor of the Florence plant having been a form of *tuberosa*, Ait. fil., in which case the Magdalena plant of Purdie represents an undescribed species, unless as above said, it should turn out after all to be the *elegans* of Todaro. Grisebach in the "Catalogus Pl. Cub." duly recognized Wright's no. 3250 as the true *cubensis*, but in the Flora of the British West Indies (1864) he admitted only two West Indian species viz. "*cubensis*" and "*gigantea*"; to the former he attributed "leaves linear lanceolate, coarsely spinose-dentate," which is plainly meant for *tuberosa*, and yet cited "Jacquin Amer Pict. t. 281 f. 25" which is, of course, the "*ciliato-spinose*" *Agave cubensis*. This he gives as "naturalized in Jamaica" citing Purdie, whose plant was collected, as we have just seen, on the north coast of South America; if any doubt existed as to the supposed Jamaican habitat it would be dissipated by the sets at Kew, where one sheet of Purdie's Santa Martha gathering is marked "*F. cubensis*" in the handwriting of Grisebach. His "*gigantea*," so far as the Antilles are concerned, was no doubt *tuberosa*, Ait. fil., for he cites Tussac and, as the only example he had personally seen, gives a specimen collected by Wulschlaegel in Antigua. It seems possible that Purdie's plant is the *elegans* of Todaro; and in that case we should probably reduce *tuberosa*, Ait. fil., to *spinosa*, Targioni-Tozzetti, on the one hand, and *elegans* of Todaro to *stricta* Jacobi on the other, but see *stricta*. In any case until the *Furcraeas* of South America have been further studied,

nothing can be gained by too summary revision of the nomenclature.

F. STRICTA, Jacobi in Abhandl. Schles. Gesellsch. 1869, p. 171.

From the description this might be the *elegans* of Todaro, or even *macrophylla*, Hook. fil., but the only specimens that come near it are those of Purdie from the Magdalena littoral discussed under the preceding. Jacobi's is too small in its proportions for normal *macrophylla*, and the geographical range of this moreover is uncertain. It seems hopeless to identify Jacobi's plant at the present day, and the writer therefore has included *elegans* in the list of known species, as it is at least supported by an elaborate description and figure. In the Kew Herbarium there is a noteworthy specimen from the Rottlerian Herbarium, taken by Klein on Oct. 25th, 1811, from the Mission Garden at Tranquebar in S. India, which has quite the leaf of *elegans* or *stricta* as described by their authors; the flowers accompanying are undoubtedly those of a *Furcraea*, but the leaf, which seems to have a terminal spine, is hardly distinguishable from that of *Agave Cantala*, Roxb. It seems not impossible that the *Fourcroya Cantala* of Haworth was suggested by this or a similar example, taken with Linnaeus' citation under his "*vivipara*" of Rumpf's fig. 109 in vol. v. of the Herb. Amb., which is *A. Cantala*, along with Commelyn's "*polygona*," a quite different species.

F. VALLECULATA, Jacobi in Abhandl. Schles. Gesellsch. 1869, p. 175.

Sent from Kew to Jacobi as "*Selloa*," but evidently something different, possibly the S. Brazilian plant depicted by Wettstein (see "*F. gigantea*," Wettstein, non Ventenat, above). Until we know more of the South American forms it would be inexpedient to exclude the name altogether.

F. (FOURCROYA) VIVIPARA, p. 587, Gard. Chron. 1869.

This was probably, from the indications, *F. tuberosa*, Ait. but it does not appear by whom it was exhibited, and the

writer cannot discover how the name originated, though it is quite likely that it refers to the *Agave vivipara* of Willdenow. Linnaeus' "*A. vivipara*," if we exclude certain erroneous synonyms, was based on Casper Commelyn's* "*Aloe polygona*" which that author himself identified with Munting's "*minor*" and regarded as quite different from Hermann's "*sobolifera*"; from the figure it was clearly an Eu-*Agave* of the "*Keratto*" type.

Miller's *Agave vivipara* has a different history. Up to the 6th edition (1752) of the Gardener's Dictionary he did not distinguish *Agave* from *Aloe*, and his *Aloe* no. 7 is "*Aloe americana sobolifera*" of Hermann. In the 7th edition *Agave* was separated, but without the use of Linnaean binomials. Under the 5th kind, the "Childing *Aloe*," Hermann's "*sobolifera*" is cited, but the description in the text refers manifestly to a species of *Furcraea*, and the writer thinks there can be little doubt that the plant intended was the *F. undulata* of Jacobi, or a closely allied species. The 8th edition, which is that most usually quoted, simply repeats under "*A. vivipara*" this account given in the seventh. In the 1st edition (1789) of the Hortus Kewensis, Linnaeus (Sp. Plant.) and Miller's 1st edition are cited, and it is stated that Philip Miller had the plant in cultivation [at Chelsea] in 1731. In the second edition (1811) the synonymy is expanded, and among others Willdenow, whose specimen was a *Furcraea*, is quoted, but the plant itself is not now represented in the Garden unless by examples since referred to *F. undulata*, Jacobi or *pubescens*, Baker (non Todaro). The "*A. vivipara*" now at Kew, as already stated, is a modern importation from the East Indies and is *Agave Cantala*, Roxb., as is likewise a dried specimen in the Herbarium from the Philippines.

F. WATSONIANA, Hort. Sander. ex script. anon. in Gard. Chron. 1898, i. 243. [x]

This name appears first in an account of a Horticultural Exhibition at Ghent in 1898, and the illustration leaves no

* Praeludia (1703) p. 65, fig. 15.

doubt of the plant's identity with that now in the "Succulent House" (No. 5) at Kew. Mr. Watson, Curator of the Royal Gardens, to whom the writer desires to express his acknowledgments in connection with these notes, considers that this is a variety of *F. gigantea* Vent., and there can be no question in the writer's view that this is the origin of a most elegant and interesting form, bearing much the same relation to *F. gigantea*, Ventenat that *Agave americana* β *variegata* Bot. Mag. 3654 does to the much less common green form of *A. americana*, Linn.

SYNONYMY.

In dealing systematically with the Agaveae it is hopeless to attempt adjustment of the post-Linnaean nomenclature without mastering the literature that went before the Species Plantarum; but the writer has endeavored in the preceding notes to clear the ground so far as necessary for the present purpose and it need not be gone over here afresh.

Local and vernacular appellations also, even when taken up in formal treatises, are noticed only under the connected scientific names, and this solely where it seemed unavoidable. Under *Furcraea* (and its various spellings) names that are never likely to be verified, and "excluded species," are distinguished by the mark (†); where a name was published under some other genus than *Furcraea* it will be found under that other genus; the arrangement of genera and, under each genus-title, of the species, is alphabetical; only the author's name is stated unless more precise detail seemed to be called for; in most cases the full reference has been given in these notes already.

*AGAVE angustifolia**, J. fide = *AGAVE TUBEROSA*, Mill.?
 Hort. Par. ex Lamarck, f. Lamarck.
 Enc. (1784) non Haworth.

* All names that were at any time valid under the Linnaean genus *Agave* are to be traced under **Furcraea** Vent.

- angustifolia*, Hort. Par. ex = AGAVE ANGUSTIFOLIA J.
 Steudel Nom. (ed. 2) i. 36 f. Hort. Par. ex La-
 (1840). marek (preced.)
aspera, Jacquin (1762). = FURCRAEA (Fourcroya)
 ASPERA, M. Roemer.
australis, Steudel Nom. = FURCRAEA AUSTRALIS,
 (ed. 1) p. 18 (1821). Haworth.
campanulata, Sessé et Moc. = **Furcraea tuberosa**, Ait. fil.
 Fl. Mexic. ant. 1809 (?)

The date of the original publication is not ascertainable from the writings of Colmeiro & Ramirez, or any other authority at present accessible to the writer; but Sessé died between 1804 and 1809 apparently. The description is inadequate, but as the plant was collected at the town of San German in Puerto Rico it was probably *F. tuberosa*.

- Commelini*, Salm Dyck in = FURCRAEA COMMELYNI,
 Hort. Dyck. (1834). Kunth.
cubensis, Jacquin (1763). = **Furcraea cubensis**,
 Ventenat.
cubensis, Sprengel Syst. ii. = FURCRAEA CUBENSIS,
 29 (1825). Haworth.

Sprengel, who was followed by a few later authors, put back the species of *Furcraea* known to him from previous works into *Agave*, on manifestly insufficient grounds. The "*cubensis*" of Haworth is not *F. cubensis*, Ventenat because for one thing it includes *F. tuberosa*, Ait. fil. β , which is *F. tuberosa*, Ait. fil. of the present paper.

- joetida*, Linn. (1753) also = **Furcraea gigantea**,
 Sprengel (1825). Ventenat.
joetida, Aublet (1775). = FURCRAEA GIGANTEA,
 Ventenat.

The remarks extend, however, to *Furcraea tuberosa*, Ait. fil. by implication.

- joetida* Lamarck (1784). = FURCRAEA GIGANTEA,
 Ventenat (ex desc.)

Maguey. Jacquin's Cuban plant is *Furcraea cubensis* of Ventenat, and is not known to occur anywhere near Mexico proper; J. N. Rose (Contrib. U. S. Nat. Herb. v.) and others have shown that the pulque is obtained from different species of Eu-Agave, largely from *A. atrovirens*, Karwinski, but not from *A. americana*, or "*mexicana*", and further that the pulque-producing species are perfectly distinct from those from which in practice fiber is extracted. In the Supplement of 1810, Poiret (under *Furcraea* as a section of *Agave*) redescribed "*Agave mexicana*, Lamarck," (which by later usage would be "*A. mexicana*, Hort. Par. ex Lamarck") omitting the original synonymy, but ascribing to the *type* Jacquin's *Agave cubensis*, which Lamarck himself restricted to variety β . Poiret at the same time added as a synonym *Agave odorata*, Persoon,—a name wrongly coined for the Cuban plant of Jacquin. If we set aside Lamarck's synonym, and fall back for his type (for which only could the name "*mexicana*" be retained in any case) on the actual Garden plant, which was very likely, though proof is impossible, equivalent to the *Agave Vera Cruz* of Miller, then "*Vera Cruz*" has at least a dozen years' priority, and was moreover supported by an adequate description and correct synonymy. If on the other hand we exclude the original "*mexicana*" of Lamarck as being simply Morison's imaginary species, we are left with *A. mexicana*, Poiret (1810) (which is *A. mexicana*, Lamarck in part only), and that is merely a belated synonym of *Furcraea cubensis*, Vent. (1793), which is *Agave cubensis*, Jacquin intact, but duly transferred to the genus *Furcraea*. T. Moore, in Gard. Chron. 1879 (pp. 583 & 614), revived "*mexicana*" for an Eu-Agave, which, though not certainly identified, may have been a good species; but in view of the ambiguous origin and confused treatment of the name, its final disappearance from among the Agaveae is greatly to be recommended.

odorata, Persoon Syn. i. 380 = **Furcraea cubensis**, Ventenat. (1805).

spinosa, Steudel Nom. (ed. 2) p. 37 (1840). = **FURCRAEA SPINOSA**, O. Targioni-Tozzetti (1808).

- subinermis*, M. Roemer Syn. = AGAVE VIVIPARA, Arruda
 Ens. 289 (1847). (infrâ).
- tuberosa*, Phil. Miller Gard. = **Furcraea tuberosa**, Ait. fil.
 Dict. ed. viii. (1768) also (1818).
 Sprengel Syst. ii. 79
 (1825).
- tuberosa*, Lamarck Enc. = AGAVE TUBEROSA, Miller,
 (1784). (= preced.) f. Lamarck.
- tuberosa*, Aiton in Hort. Kew. = AGAVE TUBEROSA, Miller,
 (1 ed.) (1789). i. e. **Furcraea tuberosa**,
 Ait. fil.
- tuberosa* [var.] β , Aiton in = FURCRAEA (Fourcroya)
 Hort. Kew. (1 ed.) (1789). GEMINISPINA, Jacobi,
 i. e. **Furcraea tuberosa**,
 Ait. fil.
- vivipara*, Linn. Sp. Pl. (ed. 2) = FURCRAEA sp. (ex desc.)
 i. 461 (1762).

The synonymy however includes Rumpf, Herb. Amb. v. t. 94 which is *Agave Cantala*, Roxb., and "Aloe americana polygona" of C. Commelin (Praeludia, p. 65, fig. 15) which was probably an Eu-Agave of the type of *A. antillarum*, Descourtilz: in the first edition of the Species Plantarum (1753), at i. 323, Commelin's '*polygona*' is the only actual synonym; P. Hermann's "Aloe americana sobolifera" (Hort. Lugd. 1687, pp. 16, 17) is cited, but in an inferior and doubtful position, possibly because Commelin had expressly declared that it was not the same as his "*polygona*." It has been a question whence Linnaeus got his description of the stamens for his "*vivipara*," which is that of *Furcraea*; there is nothing in the text of the Praeludia to suggest it, but the illustration might be squared by a student who had never seen the living plants with Hughes' account of the Barbados Silk-grass (see *A. vivipara*, Maycock below), published in 1750.

Great confusion has been caused by the supposition, not yet quite extinct, that the production of bulbils in the Agaveae is a definite specific character. That Linné's immedi-

ate followers looked on his "*Agave vivipara*" as a *Furcraea* as proved by Willdenow's Herbarium.

vivipara, Phil. Miller Gard. = **FURCRAEA** (*Fourcroya*)
 Dict. ed. viii. (1768). **UNDULATA**, Jacobi?

vivipara, Lamarek Enc. Meth. = **AGAVE VIVIPARA** Linn. Sp.
 i. 53 (1784). Pl. (ed. 2).

The remarks however take in *F. tuberosa*, Ait. fil.: "*A. vivipara*" of the Illustrations 235, fig. 1 (1793) is simply copied from Hermann's figure of his "*Aloe americana sobolifera*" and goes back therefore to the first edition of the Sp. Plantarum.

vivipara, Willdenow Sp. Pl. = **Furcraea** sp. (**GIGANTEA**,
 ii. 193 (1799). Ventenat?)

The specimen does not enable the writer to say more as to the species.

vivipara Sessé & Moc. in Fl. = **Furcraea cubensis**, Vent.
 Mexic. ed. Ramirez, p. 87.

The plant was collected (by Mociño?) between Havana and Guanabacoa, and the description answers to *F. cubensis*. It seems doubtful if the Island plants included in the Flora Mexicana were jointly collected; the notes on "*vivipara*" indicate but one observer.

vivipara, Arruda da Camara = **FURCRAEA** sp. (ex descr.)
 (1810).

The native South American name given in Arruda's tract (*Caroata assu*) possibly belonged to a Bromeliad; the Portuguese "*Piteira*" is believed to be usually applied to an *Eu-Agave*. It is doubtful how far Arruda was dealing with an actual Pernambuco plant, and not simply fitting in accounts by prior authors. It is quite possible, as Schultes has suggested, that Brotero's *Fourcroya agavephylla* may have been Arruda's "*Agave vivipara*," but Brotero seems to have had material or reports from other parts of the Brazils before him also.

vivipara, Maycock in Fl. = **Furcraea tuberosa**,
 Barbadosis, p. 134 (1830). Ait. fil.

Maycock gives, in all, three different *Agaveae* as found in Barbados, viz. (1) "*A. americana a.*" (2) "*A. americana β.*" (3) "*A. vivipara.*" Of these no. 2 is doubtless the *A. americana* var. *β variegata* of Bot. Mag. 3654, and in Barbados, as elsewhere, a garden plant of which the origin is so far undiscovered. By his no. 1 Maycock understood one or more of the "*Keratto*" group, which is characteristic of the Western Antilles, but extends, though possibly not as an original inhabitant, to the lesser islands, and to parts of the mainland, *e. g.* the coasts of Guiana and Venezuela; he was naturally surprised to find no. 2 authoritatively named in Europe "*A. americana*," perceiving rightly that it is a very different plant from the West Indies type which he was accustomed to refer (erroneously) to the "*americana*" of Linnaeus. For no. 3 he cites Hughes [History of Barbados] p. 224, where a good description of the local Silk-grass (cf. "Silk-Dagger" etc. in Barber) or *Aloe Barbadiensis* (cf. Hort. Eltham. tab. xix. fig. 21 and text 1, 23) leaves no room for doubt regarding the identity of Maycock's "*A. vivipara*" with *Furcraea tuberosa*, Ait. fil.: Maycock observes that the *Keratto* was usually planted, whereas "*A. vivipara*" occurred more in natural situations: and he adds that the Jamaica Silk-grass must be something altogether different. What that was or is, need not here be discussed, but it certainly was not any species of *Furcraea*.

BESCHORNERIA *multiflora*, = **Furcraea Bedinghausi**,
Hort. ex K. Koch in K. Koch.
Wochenschr. vi. p. 234
(1863).

FOURCRAEA *gigantea*, Reichb. = **Furcraea gigantea**,
Fl. Exot. iii. no. 202 (1835). Ventenat.

The illustration is copied from Bot. Mag. 2250.

FOURCROEA *Cantala*,† = **Agave Cantala**,
Haworth Suppl. (1819). Roxburgh?
madagascariensis,† Haworth = **Furcraea gigantea**,
Suppl. (1819). Ventenat?

Haworth compares with this his "*F. Cantala*" which is usually regarded as the same as *Agave Cantala*, Roxburgh; but both were very young pot-plants in the Chelsea garden, and are altogether dubious.

- FOURCROYA *agavephylla*, = FURCRAEA CUBENSIS,
Brotero ex Schultes Syst. Haworth (q. v.)
vii. 731 (1829).
- agavephylla*, Brotero ex = AGAVE VIVIPARA, Arruda
Schultes Syst. vii. 1717 (supra), pro parte =
(1830). **Furcraea elegans**,
Todaro?
- Aitoni*, † Jacobi (1869). = **Furcraea** (Fourcroya)
undulata, Jacobi?
- altissima*, Todaro ex Fran- = **Furcraea macrophylla**,
ceschi in Bailey Cycl. Amer. Hook. fil. (1898)?
Hort. ii. 620 (1900).
- Specimens from the Palermo Garden are at Kew, but too young for determination; the leaf resembles that of young plants of *F. macrophylla*. The name occurs, but without any description, at p. 11 in Todaro's paper on *F. pubescens* (1879): it was proposed later by Sir Daniel Morris for *Furcraea macrophylla*, Hook. fil. but was not adopted, possibly in view of its prior mention for the unpublished species. The description in Bailey's Cyclopaedia (article *Furcraea* by Franceschi, Oliver and Wilh. Miller) furnished by Franceschi, is very brief, but suggests *macrophylla*.
- aspera*, M. Roemer (1847). = FURCRAEA (Fourcroya)
CUBENSIS var. INERMIS,
Baker in Bot. Mag. 6543
(1881)?
- Barilletti*, † Jacobi (1869). = **Furcraea gigantea**,
Ventenat?
- Commelyni*, † Kunth (1850). = **Furcraea gigantea**,
Ventenat?
- cubensis*, Martius Fl. Brasil. = FURCRAEA CUBENSIS,
iii. i. p. 192 (1855). Haworth, non Ventenat.

The synonyms, more especially the vernacular and local

names, however, cover the "Keratto" Agaves, *F. tuberosa*, Ait. fil., and "*Agave vivipara*" of Arruda da Camara.

cubensis, Grisebach in Fl. Br. = **Furcraea tuberosa**,
W. Indies 1864. Ait. fil. (ex loc. Antigua).

The Jamaican habitat is a mistake for the north coast of South America.

cubensis, Grisebach in Cat. = **Furcraea cubensis**,
Pl. Cub. (1866). Ventenat.

Deledevanti, † C. Rivière in = **Furcraea tuberosa**, Ait.
Rev. des Cult. Colon. xi. fil.?
pp. 68-69 (1902).

Reported from Algeria; no description given, but it is probably the "Hayti Hemp" of certain markets, and may be the plant, yielding fiber of the same class as "Sisal" and "Pite d'Haiti," which forms the subject of an article by M. Fasio in Journ. d'Agricult. Tropicale no. 41 of 1904, p. 342. "Pite d'Haiti" has been commonly referred to *Furcraea gigantea*, Ventenat, but the original Haiti plant is more likely to have been *Furcraea tuberosa*, Ait. fil.

depauperata, † Jacobi (1866). = FURCRAEA ALBISPINA,
Baker (1893)?

flaccida,* Hort. Panorm. ex = **Furcraea Bedinghausi**,
Hort. Kew. K. Koch?

flavoviridis, Hook. (Feb. = **Furcraea** (Fourcroya)
1860). **Selloa**, K. Koch (Jan.
1860)?

geminispina, † Jacobi (1866). = **Furcraea tuberosa**,
Ait. fil. (1811).

Ghiesbrectii, † Hort. ex = FURCRAEA (Fourcroya)
Jacobi (1867). DEMOULINIANA, Jacobi
(1867) fide Jacobi.

Todaro however (Hort. Panorm. i. 13) gives *F. Ghiesbrectii* (sic.) of Verschaffelt's 1867-68 Catalogues as being *F. elegans*, Todaro, which can hardly be the same as *F. Demouliniana*, Jacobi.

* Two different forms seem to have found their way to England under this name; one of which may be *F. atroviridis* Jac. & Goepp.

gigantea, Regel in *Gartenflora* = **Furcraea tuberosa**,
1852, p. 21, t. iii. Ait. fil.

Jacobi (*Versuch, etc. Sep. Abdr.*, p. 270) pointed out that this could not be *F. gigantea* and suggested that it might be *F. Selloa*, K. Koch; it was more probably intended for *F. tuberosa*, Ait. fil., and Jacobi would no doubt have recognized this had he seen good examples of the Kew "*tuberosa*." Regel identified his plant with Roemer's "*var. Willemetiana*" of *F. gigantea*, which is simply a book adaptation of *Funium pitiferum*, Willemet (q. v.).

gigantea, Martius *Fl. Brasil.* = FURCRAEA GIGANTEA,
iii. i. pp. 187-88 (c. 1855). Ventenat.

The remarks, however, cover *Furcraea tuberosa*, Ait. fil. as well.

gigantea, Grisebach in *Fl. Br.* = **Furcraea tuberosa**,
W. Indies (1864). Ait. fil.?

The description, which is very brief and not altogether applicable, relates to *F. gigantea*, Ventenat, or rather to the older descriptions of that plant; but the only specimen actually seen by Grisebach was from Antigua, and was therefore in all probability *F. tuberosa*, to which, moreover the remarks apply directly.

gigantea, † Wettstein in *Veg.* = FURCRAEA VALLECULATA
Bild. S. Brazil tab. iv. Jacobi?
(1906) non Ventenat.

gigantea var. *Willemetiana*, = *Funium pitiferum*, Willemet
M. Roemer in *Syn. Ens.* (infra).
(1847).

Roemer's type, as regards distribution, covers both *tuberosa* and *gigantea*.

gigantea var. *Willemetiana*, = **Furcraea tuberosa**, Ait.
J. G. Baker ex Kew Bul- fil.?
letin 1892, p. 101.

Reported from St. Vincent: Barbados specimens similarly

named in Herb. Kew. appear to be undoubtedly referable to *tuberosa*.

hexapetala† (Jacq.) Urban in = **Furcraea cubensis**, Ven-
Symb. Antill. iv. 152 (1903). tenat (1793).

Jacquin's "*Agave hexapetala*" was undoubtedly prior to his "*Agave cubensis*," but as Ventenat, when founding *Furcraea*, took up "*cubensis*" it must stand. Sintenis' 482 from Puerto Rico, cited by Urban, may be *F. tuberosa* Ait. fil.; it does not appear in any case to be *F. cubensis*, Ventenat. Of the localities given in the Symbolae, several undoubtedly belong to *F. tuberosa*.

interrupta,† Hort. van Houtte. = **Furcraea tuberosa**, Ait.
ex Jacobi in Abhandl. fil.?
Schles. Gesellsch. 1869,
p. 169.

It is impossible to say what Jacobi's type of "*F. tuberosa*" (which consisted of leaves only) may have been; from the description it might be a plant collected on the Magdalena littoral by Purdie which has been discussed above under *F. spinosa*, Targioni-Tozzetti; Jacobi himself identified it with "*F. interrupta*" of Van Houtte's nursery at Ghent; and of that there is a photograph at Kew which represents apparently a state of *F. tuberosa*, Ait. fil.

Lindeni, Ed. André in Ill. = **Furcraea** (Fourcroya)
Hort. xxi. 167 (1874). **Selloa**, K. Koch (1860)?

lipsiensis,† Jacobi (1869). = **Furcraea tuberosa**, Ait.
fil.?

longaeva, Ed. André in Ill. = **Furcraea** (Fourcroya)
Hort. x. Misc. p. 43, 370 **Bedinghausi**, K. Koch.
verso.

macra,† Hort. Par. ex Jacobi = **FURCRAEA** (Fourcroya)
(1869). **DEPAUPERATA**, Jacobi.

Noackii†, Hort. ex Baker in = *Agave Noackii*, Jacobi.
Bot. Mag. 6292 (1877).

- pubescens*, Baker in Bot. Mag. = **Furcraca** (Fourcroya)
7250 (1892) vix Todaro **undulata**, Jacobi (1869).
(1879).
- pugioniformis*, † Hort. Ver- = **FURCRAEA** (Fourcroya)
schaffelt. ex Todaro (1876). **ELEGANS**, Todaro f. To-
daro.
- rigida*, † Haworth (1812). = **AGAVE RIGIDA**, Philip Miller
Gard. Dict. ed. viii.
(1768) non Engelmann.

Engelmann supposed *Agave sisalana*, Perrine (the Sisal Agave of the Bahamas, East Indies, etc.) and *A. longifolia*, (" *A. elongata*," Baker in Kew Bulletin non Jacobi, the Yucatan "Sashqui") to be varieties of *A. rigida*, Mill., which was not in reality either of those plants. It is doubtful at present what *A. rigida* of Miller may have been, but it pretty certainly was not a *Furcraea*.

- rigida*, † Landry ex Jacobi = **FURCRAEA** (Fourcroya)
(1867). **DEMOULINIANA**, Jacobi
(1867) f. Jacobi.
- Roetzlii*, † Ed. André in Rev. = **Furcraca Bedinghausi**,
Hort. 1887, p. 353 fig. 71. K. Koch (1867).
- Roetzlii* var. *atropurpurea*, † = **Furcraca** (Fourcroya)
Hort. de Smet. ex Gard. **undulata**, Jacobi?
Chron. 1876 (i.) 630.
- sobolifera*, † Hort. Cels. ex = **FURCRAEA** (Fourcroya)
Jacobi (1867). **DEMOULINIANA**, Jacobi
(1867) f. Jacobi.
- spinosa*, O. Targioni-Tozzetti = **Furcraca tuberosa** Ait.
(1808). fil. (1818)?

Cf. at the same time, Purdie's Magdalena (Sta. Martha) specimens in Herb. Kew., which, if not the *F. elegans* of Todaro, may represent an undescribed species, or *F. spinosa*.

- stricta*, Jacobi (1867). = **Furcraca** (Fourcroya)
elegans Todaro (1878).
- tuberosa*, Fenzl ex Baker in = **Furcraca** (Fourcroya)
Gard. Chron. 1879, p. 623. **undulata**, Jacobi.

- tuberosa*, Belg. Hort. 1860 p. 219. = **Furcraea gigantea**, Ventenat.
- tuberosa*, Franceschi in Bailey Cycloped. Amer. Hort. ii. 620 (1900) vix Ait. fil. = **Furcraea** (Fourcroya) **Selloa**, K. Koch?
- tubiflora*, † Kunth & Bouché in Linnaea xix. p. 381 (1847). = BESCHORNERIA TUBIFLORA, Kunth Enum. v. 844.
- vivipara*, † Gard. Chron. (1869), p. 587. = **Furcraea tuberosa**, Ait. fil.?
- No description given; shown at an International Horticultural Exhibition in Russia: probably was *Agave vivipara*, Maycock (which see above).

Watsoniana, Hort. Sander. ex Gard. Chron. 1898 (i.) p. 242 fig. 90 (p. 243). = **Furcraea gigantea**, Ventenat var. **Watsoniana**.

Inflorescence not seen; Mr. Watson considers this, as does the writer, to be a variegated form of the true *F. gigantea*.

FUNIUM *pitiferum*, † Willemet in Usteri Ann. xviii. p. 26 (1796). = **Furcraea gigantea**, Ventenat (1793).

The "Mauritius Hemp"; Willemet's account covers possibly both *F. gigantea* and *F. tuberosa*.

FURCRAEA *australis*, † Haworth Syn. (1812). = DORYANTHES EXCELSA, Correa in Linn. Trans. vi. 211 (1802).

Commelyni, † Baker in Amaryllid. (1888). = FURCRAEA (Fourcroya) CUBENSIS, Haworth var. INERMIS, Baker in Bot. Mag. 6543 (1 Feb. 1881).

cubensis, † Haworth (1812). = (pro parte) (1) FURCRAEA CUBENSIS, Ventenat (1793); (2) FURCRAEA TUBEROSA, Ait. fil.

cubensis, † Hasskarl in Retzia ii. 19 (1856). = **Furcraea tuberosa**, Ait. fil.

Hasskarl says that his plant, received at Buitenzorg from Groningen as "*F. tuberosa*," squared exactly with Jacquin's description of *Agave cubensis* except that Jacquin gives the leaves as "ciliate-aculeate," which he says might be due to the description having been taken from imperfectly developed specimens in European gardens. Jacquin's description, written doubtless from the plant discovered by himself in Cuba, gives the leaf-margin as "ciliato-spinose," whereas that of *tuberosa* is "dentato-spinose." From Hasskarl's own description he had evidently before him *F. tuberosa*.

- cubensis* var. *Lindeni*, Kew = **FURCRAEA** (Fourcroya)
 Hand-List Tend. Monocot. LINDENI, Ed. André
 1897. (suprà).
foetida,† Haworth (1812). = **Furcraea gigantea**, Ven-
 tenat (1793).
gigantea, Baker in Amaryll. = **Furcraea tuberosa**, Ait.
 (1888). fil.

The description belongs partly to *F. gigantea*, partly to *F. tuberosa*, but mainly to the latter.

- tuberosa*, Hasskarl in Retzia = **Furcraea gigantea**, Ven-
 ii. 16 (1856). tenat.
FURCROEA *gigantea*, Redouté = **FURCRAEA** (Fourcroya)
 in Hist. Pl. Succ. (post CUBENSIS var. INERMIS,
 1806). Baker in Bot. Mag. 6543
 (1881)?

The letter-press, as is carefully noted by De Candolle, is taken from Ventenat, but the plate differs somewhat; it may have been based on Jacquin's figure of *Agave foetida*, Linn., but it agrees, on the whole, with the form above noted.

- gigantea*, Redouté in Liliacées = **FURCRAEA GIGANTEA**,
 viii. 476 (1816). Ventenat.

The text, however, relates partly to *F. tuberosa*, Ait. fil.

- gigantea*, Tussac in Fl. des = **Furcraea tuberosa**, Ait. fil.
 Antilles (1818).

The figure is reproduced from the *Plantes Grasses*, and the Latin description is abridged from that of *F. gigantea*, Ventenat; but the French account by Tussac manifestly refers to *F. tuberosa* Ait. fil.

- gigantea*, Hook. in Bot. Mag. = **Furcraea gigantea**,
2250 (1821). Ventenat (1793).
- gigantea* var. † Medley Wood = **FURCRAEA** (Fourcroya)
in Gard. Chron. 1898 (i.) LINDENI, Ed. André
p. 227 non Ventenat. (suprà).
- ROEZLIA bulbifera*, † Belg. = **Furcraea Bedinghausi**,
Hort. 1883, p. 133 (nomen). K. Koch f. Baker in Bot.
Mag. 7170 (1891).
- regia*, † Hort. ex Baker in = **Furcraea Bedinghausi**,
Bot. Mag. 7170 (1891). K. Koch (1860).
- YUCCA acaulis*, HBK. = **Furcraea** sp. f. Trelease in
Mo. Bot. Gard. Rep. xiii.
(1902) p. 114.
- argyrophylla*, Hort. ex Baker = **Furcraea Bedinghausi**,*
in Bot. Mag. 7170 K. Koch.
(1891).
- Parmentieri*, Hort. ex Baker = **Furcraea Bedinghausi**,
in Bot. Mag. 7170 (1891). K. Koch.
- Pringlei* † Greenman herb. = **Furcraea Bedinghausi**,
ex Greenm. in Proc. K. Koch.
Amer. Acad. xxxiii. p. 474
(1898).

An abstract follows of those species that appear to the writer to be fairly established, and also of those which, though as yet not properly known, may be verified in the future, as against others, dealt with previously, which are either invalid, or unlikely to be identified. Notes are added indicating the supposed range of each species, or its origin, if known only in collections, and the approximate date of dis-

* For a fuller extrication of *Furcraea Bedinghausi* synonyms under *Yucca* see Trelease on Yuccae in Mo. Bot. Gard. Rep. xiii. (1902) pp. 27-183.

covery or introduction. One plant (included in the Kew Garden Hand List of Tender Monocotyledons 1897 as *F. Desiderantii*) having died out is not accounted for in the preceding parts, and therefore omitted.

ADMITTED SPECIES OF *FURCRAEA*.

1. **tuberosa**, Ait. fil.—Haiti, and (introduced?) E. Antilles, about sea-level: before 1516,——.

2. **gigantea**, Vent.—Costa Rica, and (often introduced?) N. & S. coasts of S. America, 0–3000 ft.: 1529, Oviedo.

3. **elegans**, Tod.—Tobago, & N. E. Brazil to Colombia (cult.) about sea-level (?): 1648, anon. correspondent of De Laet (?).

4. **cubensis**, Vent.—Cuba (also cult. Yucatan), 0–1000 ft.: before 1760, Jacquin.

5. **undulata**, Jacobi—Central America (?): introduced into English gardens before 1768 by Ph. Miller.

6. **longaeva**, Zucc. & Karw.—Mexico, Guatemala, & Bolivia* 9–10,000 ft.: before 1831, Karwinski.

7. **Selloa**, K. Koch.—Guatemala to Colombia, 3–9000 ft.: before 1860, Warszewicz (?).

8. **Bedinghausi**, K. Koch.—Mexico and adjoining Republics, about 6000 ft.: 1860, Roezl.

9. **albispina**, J. G. Baker—Native country unknown: Palermo Bot. Gard., before 1893,——.

10. **macrophylla**, Hook. fil.—Bahamas, etc. (an escape?): Morris, also Hart (before 1889); Colombia? Chile?

IMPERFECTLY KNOWN BUT POSSIBLY VALID SPECIES.

(a) *inermis*, J. G. Baker (pro var.) in Bot. Mag. 6543 (1881)—Venezuela (?): before 1688 (?),——.†

* The Bolivia form, though of the same group with *longaeva*, may prove specifically distinct.

† If this was the “*Aloe americana radice tuberosa minor non spinosa*” of the Par. Bat. Prodr. of P. Hermann (ed. S. W. A. 1689): it may possibly also be the *Agave aspera* of Jacquin.

(b) *atroviridis*, Jacobi & Goepf.—Native country unknown: introduced into Belgian gardens before 1866,——.

(c) *Demouliniana*, Jacobi.—Colombia, 5–7000 ft. (?): introduced into European gardens before 1867,——.

(d) *Lindeni**, Ed. André.—Colombia 3–9000 ft.: 1868, Linden.

(e) *valleculata*, Jacobi—S. E. Brazil, about 3000 ft. (?): cf. Wettstein Veg. S. Brazil, pl. iv.

(f) *pubescens*, Tod. non Baker—Native country unknown: Palermo Garden, before 1876,——.

EXPLANATION OF PLATES.

The habit illustrations are from photographs made in Antigua by Mr. C. A. Barber in 1892, preserved in the Kew Herbarium. The others are from sheets in the same collection photographed by Mr. Hutchinson, of the Herbarium Staff, for this article. All are published by consent of Colonel Prain, the Director of the Royal Gardens, Kew.

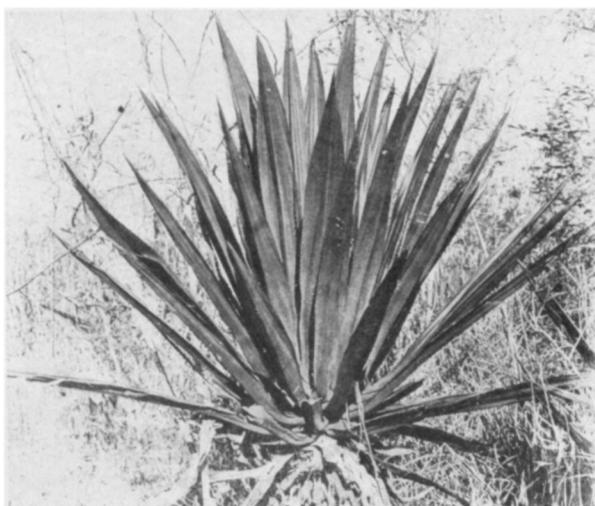
Plate 1. — Acaulescent and shortly caulescent plants of *Furcraea tuberosa*, of various ages, on Antigua. The old plant shown at the left center has developed a rather long decumbent trunk. — Photographed by Barber.

Plate 2. — Leaf of *F. tuberosa*, from Grenada, Hutchinson, 1889, in Herb. Kew., $\times \frac{1}{2} \pm$. Flowers (of *F. elegans* ?), from Tobago, Eggers, no. 5706.

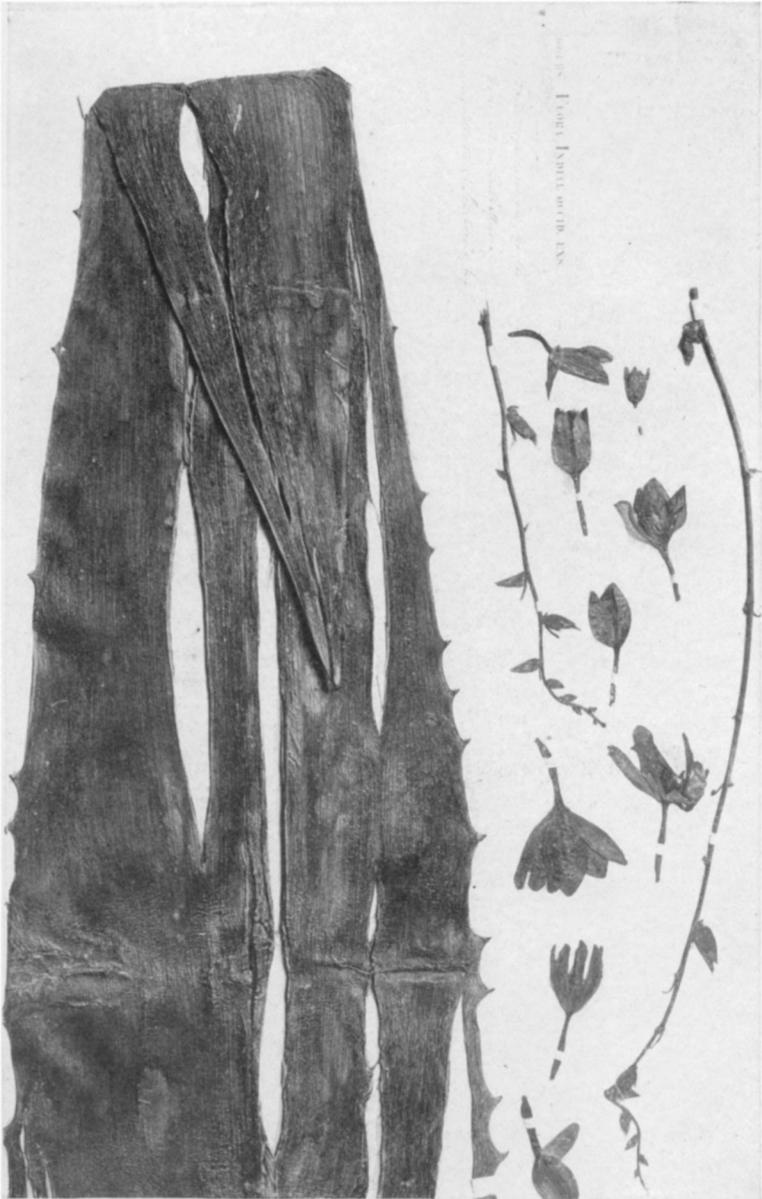
Plate 3. — 1, Inner leaf and bulbils of *F. tuberosa*, from the Grenadines group of islands, Smith Brothers, in Herb. Kew., $\times \frac{1}{2} \pm$; 2, Panicle fragment of *F. tuberosa*, from Antigua, Barber, 1892.

Plate 4. — *Furcraea tuberosa*, Ait., fil. Upper part of leaf, and flower, of the type sheet (from Bishop Goodenough's herbarium), from the first specimen known to have flowered in Europe; Kew Gardens, 1793, in Herb. Kew., $\times \frac{2}{3} \pm$.

* If distinct from *Selloa* this may prove to be *flavoviridis*, Hook. which in that case should be restored as the name both of the Colombian plant, and of the variegated garden form.



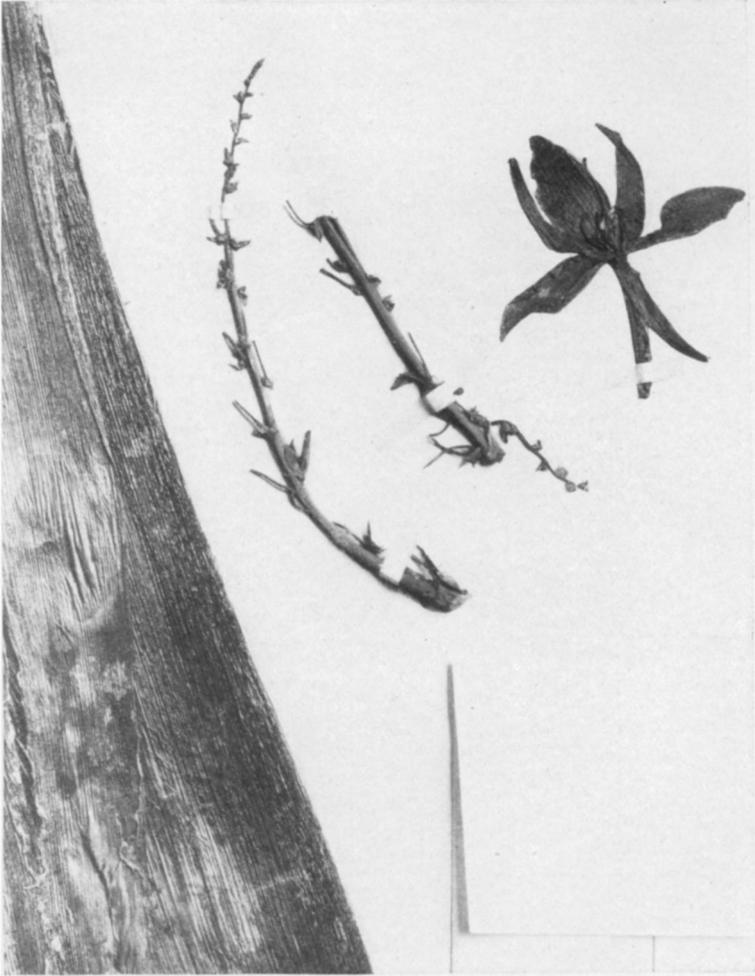
FURCRAEA TUBEROSA.



FURCRAEA TUBEROSA (leaf) and *F. ELEGANS* (flowers).



FURCRAEA TUBEROSA.



FURCRAEA TUBEROSA.