

# THE GENUS *BAMBUSA* AND SOME OF ITS FIRST-KNOWN SPECIES <sup>1)</sup>

by

F. A. McCLURE, Ph. D. <sup>2)</sup>

(Field Service Consultant on Bamboo, U. S. Dept. of Agriculture, Washington, D. C.)

(With 7 plates)

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My contemporaries in the study of bamboos will probably agree that we have inherited very out-of-focus pictures of the first bamboo to be given a Linnean binomial (*Arundo Bambos* L. Sp. Pl. 81, 1753), of the first bamboo genus to be set up (is it *Bambusa* Schreber Gen. Pl. 1: 236, 1789 — or is it *Bambos* Retzius Obs. Bot. 5: 24, 1789?), and of the type species of this genus (is it the common bamboo of India, or is it something else?). I believe they will agree, likewise, that current concepts of these entities need clarification, and that nomenclatural usage respecting the genus *Bambusa* and several of its first-known species must be regularized, if we are to establish our knowledge and the nomenclature of these bamboos on a firm and permanent basis.

This paper is presented in the belief that it constitutes a con-

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<sup>2)</sup> Field Service Consultant on Bamboo, Office of Foreign Agricultural Relations, U. S. Department of Agriculture, and Research Associate in Botany, Smithsonian Institution, Washington, D. C.

tribution toward the clarification of the facts and the issues involved. The subject matter is deemed appropriate to the present occasion because an outstanding feature of the distinguished career of Dr Henrard is the contribution he has made to the elucidation of concepts, and to the stabilization of nomenclature, in the field of agrostology.

Doubtless there will be some who take exception to one or another of the views expressed. The facts to be studied are many; time and space limited. New light will be cordially welcomed. Our common aim is a stable nomenclature based on clear concepts, adequately documented.

A question to which I have been for many years seeking a satisfactory answer is: What is *Arundo Bambos* L. Sp. Pl. 81, 1753? The full text of the reference follows:

#### ARUNDO

1. ARUNDO arbor. *Bauh. pin.* 18. *Hort. oliff.* 25. *Fl. zeyl. Bambos;* 47. *Boy. Indg.* 67.  
 Tabaxir & Mombu arbor. *Bauh. hist.* I. p. 222.  
 Ily. *Rheed. mal.* I. p. 25. t. 16.  
 Habitat in India utraque h.

Linnaeus did not offer a description of his own in 1753. He left the reader to struggle at first hand with the writings of others whose concepts of bamboo species obviously were as yet somewhat nebulous, a statement which can be amply documented. The Schulteses (father and son), who prepared the treatment of the Gramineae for Roemer & Schultes' edition of Linnaeus' *Systema Vegetabilium*, placed the responsibility squarely on Linnaeus' shoulders. They said (op. cit. p. 1341): "Div. Linnaeus plures Bambusae species sub *Arundine Bambos* confudisse videtur.....". Munro (op. cit., p. 103) apparently desiring to spare Linnaeus, placed the blame elsewhere: "Auctores pristini plures species Bambusae sub *Arundine Bambos* confudisse videntur, quapropter synonyma, a Linnaeo celebri citata, hic ommissa."

The descriptions given in the works cited by Linnaeus are couched in general terms, and do not give a clear picture of any particular bamboo. However, the general impression conveyed by the references, and by Linnaeus' own words, "Habitat in India utraque", is that the writers had principally in mind a large, thorny bamboo found everywhere in India. Such a bamboo is described and figured in Rhede, *Hort. Mal.* 1: 25, pl. 16, 1686.

I have not been able to consult a copy of the first (1678) edition of Part One of Rhede's work, but I have a facsimile reproduction of the bamboo reference in an edition published in Amsterdam in 1686. The typography and the illustration are excellent and, since this edition is not listed in Pritzel, it is deemed worth while to reproduce here the title page and the part on bamboo (pl. I, II):

## I L - Y.

FIG. 16.

*Ily* lingua Bramanum *Vási*, nostra communi *Bambù*, est Arbor nascens in arenosis, in excelsam altitudinem, quae eam *Téngo* exsuperat, evadens.

*Radix* ab ipso stipite non multum differens, nisi quod albicans & plurimis radiculis seu fibris sit vestita, ex geniculis, quibus distinctus est, novos oculos seu cauliculos geniculatos emittit, atque hi etiam alios ex quibus tanquam novis radicibus caules plures simul juncti assurgunt, atque ita caules novelli cum suis radiculis avulsi proseminantur; Caules autem rotundi, cortice viridi, duri & geniculati sunt ex geniculis novos ramos surculosque emittentes, atque in ipsis geniculis spinis oblongis, rigidis, acutis, uno vel etiam duobus pluribusve muniti, intus fistulosi fistulis subtilibus.

*Stipites*, qui ex radice ipsa exsurgunt, ad duorum triumve hominum altitudinem se erigunt, priusquam laterales ramulos seu surculos diffundunt, ac crassitie ferme unius spithamae evadunt, cum teneri ac novelli sunt stipites, uti & rami ferme solidi, in medio uno tantum parvo tubulo pervii, cum maxime novelli sunt, in medio, ubi tubulus aperitur, nota albicante sunt; cum vetustiores, intus cavi, & ad geniculos intersepimento lignoso clausi, & interius membrana tenui, albicante obducti, constantque lignosis, duris, albicantibus filamentis, cum teneriores sunt, exterius viridi-fusci; cum vetustiores, ex albo flavi & nitentis coloris, nullo cortice, qui lignosis filamentis interstinctus est, vestiti: Stipites hujus arboris cum vetustiores sunt, aliquo genere calcis in cavitate obducuntur, quae usui medico servatur.

*Folia*, quae geniculis caulium brevissimis petiolis insident, longa & angusta sunt longitudine unius spithamae, latitudine quae ad petiolum maxima est, digitali, versus summitatem sensim stricta, venis in longum striata, & in exteriori parte in medio uno nervo obsita, oris aspera si versus inferiora stringantur, viroris utrinque communis.

*Flores* in spicis squamosis, qui nodulis caulium congregatim insident, proveniunt, atque ex spicis apertis tenuissimis filamentis dependunt, intra quas se deinde recipiunt velut flores spicati oryzae, suntque deinde in spicis tritico similes, nisi quod mi- (p. 26) nores sunt; sexagesimo anno à satione, ut ferunt, haec arbor flores fert per unum ferme mensem proximè ante florum exortum, primùm omnibus foliis spoliatur, & postquam defloruit, emoritur.

## VIRES EJUS.

*Corticis & Foliorum* decoctum epotum servit ad sanguinem in corpore ex vulnere retentum expurgandum, confertque etiam puerperis ad materiae sanguinolentae, quae post partum retenta est, excretionem. Calx quae in stipitibus vetustis crescit, prodest in stranguriâ, iisque qui urinam purulentam mingunt.

## FIG. 16.

*Arundinem* hanc Autores nostri inter arbores describunt, eodem quo *C. Bauhinus* jure, cui in *Pinace* dicitur, *Arundo arbor*: in qua humor lacteus gignitur, qui *Tabaxir Arabibus* & *Avicenna Mambu Indorum*, in ejus arundinibus *Tabaxir* sive saccharum, *Mambu Garza*. Rectius Dominus *Hermans*, qui Anno 1676. portionem Plantae siccatae, una cum foliis & flores ex insulâ *Zellan* transmisit, *Bauhinianam* denominationem nonnihil immutavit, dum vocat *Arundinem Indioam arboream maximam, cortice spinoso*. Addit porro quod *Cingalensibus* vocetur *Nuayhas*, id est, arbor febrilis, quia febre corripuntur ii qui se lavant ex aquis, in quas arboris hujus folia decidere. Corruptè vulgò à *Lusitanis* aliiisque vocatur *Bambu* vel *Bamboes*: in Insula autem *Madagascar* praesertimque ejus Provincia *Galemboulou*, teste Domino *Flacourt*, tanta nascitur copia, ut regio inde nomen obtinuerit. *Voulu* enim ibidem nuncupatur. Ad quam immensam autem locis humidis, arenosis & paludosis, quibus gaudet, quandoque assurgat proceritatem, ex fragmentis, Clarissimi *Pisonis* munere, in porticu Horti Academici suspensis, colligere datur: quorum majus viginti octo, minus viginti sex pedum longitudinem superat. Quir & credibile est, hasce arundines, antequam essent dif-

fractae, duplo majorem longitudinem obtinuisse, cum crassities unius extremitatis, ab alterius vix differat. Admiratione quoque dignum est, tam vastam arundinum molem, tam exiguis vestiri foliis, cum maxima ex siccatis, quae assero, vix spithamam longitudine aut transversum digitum latitudine transcendat. Arundines haec insuper amputatae, & igne crematae, fertilissimum praebent cinerem, in quo omnis generis consitae plantae feliciter proveniunt: dum autem cremantur, ingentem edunt sonitum, & fragore centum aliquot sclopetorum explosiones aemulantur. Aër enim intra cancellos, internodiorum ope reclusus, dum rarefit, ampliusque spatium desiderat, parietes quaquaversum dirumpit, & vi sibi exitum quaerit.

Quam varia autem, non minus ac *Palma Cocifera*, haec planta humanum in commodum suppeditet auxilia, pluribus tradunt Autores, & imprimis *G. Piso* in *Mantissa Aromatica*, ubi praeter accuratissimam *Sacar Mambu*, sive *Tabaxir* descriptionem, videre quoque licet, tenellos hujus Arundinis ramos, praesertim radici vicinos, ab Indis condiri, & celebris illius confectionis quae *Achar* vulgò nuncupatur, & ad appetitum excitandum, ventriculique concoctionem promovendam per European dispergitur, non infimam partem constituere.

Since the pagination of the part on bamboo and the number of the relevant plate are the same in this edition as in Linnaeus' reference, we may conclude either that Linnaeus had the 1686 edition (he did not date his reference) or that the two editions must be very similar, if not identical<sup>1</sup>).

Although the shadows of at least two species known today are discernible in the caption to plate 16 (and in the plate itself, for that matter), Rhede (in the 1678 edition: Rheede; *Editor*) seems to come much nearer than the other cited authorities to affording an unequivocal documentation of a concept corresponding to *Arundo Bambos* L. Sp. Pl. 81, 1753. His very systematic, though general, description, his reference to an actual specimen, and the remarkable illustration, parts of which at least (the inflorescence and the culm section) must have been based on actual specimens, place his work in favorable contrast with the others cited.

<sup>1</sup>) On comparing the reproductions of the 1686 edition with the copy of the 1678 edition in the "Rijksherbarium" library, it appeared that, though the title pages are different and the text has been newly set up, text, pagination and plate 16 are identical in both editions (*Editor Blumea*).

During the 150 years or so following the publication of the first edition of the *Species Plantarum*, several names were published on the basis of thorny Indian bamboos (*Bambusa spinosa* Roxb. Fl. Ind. ed. 2, 2: 198, 1832; *Bambusa arundo* Nees, Linnaea 9: 471, 1835; *Bambusa orientalis* Nees, op. cit. 472). But Gamble, who probably exceeded all other authorities, with the possible exception of Kurz, in first-hand knowledge of the bamboo flora of India, states (Ann. Roy. Bot. Gard. Calcutta 7: 53, 1896) "..... I feel that without better information I am right in thinking that we have in India proper only one thorny *Bambusa*, and that that widely-spread species merely shows, as does the equally universal *Dendrocalamus strictus*, an amount of variation such as is fully accounted for by the variations of climate and soil. Both Brandis and Kurz considered that there was only one species, and I fully agree. Were I to attempt to separate it into varieties, I should make a different division to that adopted by Munro. All the three (*B. arundinacea* [including *B. Arundo*], *B. spinosa* and *B. orientalis*) have practically the same culm sheath — a character which I believe Kurz, whose knowledge of, and interest in, bamboos was so great, considered to settle the matter."

With this perspective on the Linnean concept of *Arundo Bambos* as of 1753, we may feel a reasonable degree of confidence in admitting that it may properly be interpreted as corresponding to the one thorny species of *Bambusa* common in India proper. Having admitted this, we are constrained to take the next step and apply the trivial, *bambos*, to that species.

The transfer of the trivial, *bambos*, from the genus *Arundo* to the genus *Bambusa* has been made several times already. The earliest instance that has come to my attention is that of Voss in *Vilmorin, Blumengärtnererei* 1:1189, 1896.

So much for the name; now where may we look for a more adequate picture of the plant? As intimated above, it is taken to be the one large thorny species of *Bambusa* common in India — the plant described by Gamble (op. cit. p. 51) under the name *Bambusa arundinacea* Willd., and illustrated by pl. 48 in the same work over the name *Bambusa arundinacea* Retz.

In his interpretation of the species, Gamble makes allowance for variations in habit, stature, culm-wall thickness, degree of thorniness, etc., which he attributes to local variations in soil and climate. He does, however, admit one variety, *orientalis* (Syn. *Bambusa orientalis* Nees) and sets it off from the species by means of minor characters of the "rachis" (by which, judging from his fig. 16 of pl. 48, he means "inflorescence-bearing branches"), spikelets, leaf sheath and petiole, which he believes to be constant. They are principally matters of texture and pubescence.

The suggested documentation of the species falls somewhat short of what is desirable, since Gamble's description and his drawing are both composite in nature, having been based on a miscellaneous array of more or less fragmentary material from diverse sources. However, Gamble's personal acquaintance with living plants of this species, and his appreciation of the importance of the vegetative organs (especially the culm sheath) for purposes of recognition and identification, are factors which incline me to value his judgment concerning this bamboo above that of

any of his predecessors. In any case, it appears to me that it is better to base our documentation on sources where the light of modern work has fallen, rather than on the vague pre-Linnean descriptions.

To be complete, the documentation of the species should include an ample specimen as a standard of reference. Ideally, this specimen should embrace both inflorescences and culm sheaths, and should be accompanied by a reasonably complete and detailed description of the plant in all of its parts, with photographs and sketches of aspects difficult to describe in words. Unless such a specimen is to be found in some herbarium, which is highly unlikely, it is deemed better to await the collection of such a specimen than to make an arbitrary selection of any classic specimen of the conventional sort now in existence, whatever its relation to published descriptions and to names which may be referable to this species<sup>1)</sup>.

In the light of present knowledge, therefore, the following citation and documentation is proposed for the species under discussion:

**Bambusa Bambos**<sup>2)</sup> (L.) Voss in Vilmorin, *Blumengärtnerei* 1: 1189, 1896, described and illustrated by Gamble, *Ann. Roy. Bot. Gard. Calcutta* 7: 51, pl. 48, 1896 under the misapplied name, written *Bambusa arundinacea* Willd., and *Bambusa arundinacea* Retz., respectively, in the text and under the illustration. Syn.: *Arundo Bambos* L. Sp. Pl. 81, 1753 (quoad *Bambusae speciem maximam spinosam Indiae Or.*).

The foregoing discussion does not touch upon two important questions that may occur to the reader, namely: What is the source, and what is the identity, of the flowering specimen of a spiny bamboo that is to be seen in Linnaeus' herbarium today?

There is such a specimen — the first one in the folder labeled "*Arundo*" — and it is inscribed, at the bottom of the sheet, in the hand of Linnaeus, "1. *Bambos*" (pl. III). As a setting for our discussion of this specimen it is appropriate to reproduce here the text of the reference, *Arundo Bambos* L. Sp. Pl. 121, 1762.

#### ARUNDO

"*Bambos*. 1. ARUNDO calycibus multifloris, spicis ternis sessilibus. *Arundo* arbor. *Bauh. pin.* 18. *Hort. cliff.* 25. *Fl. zeyl.* 47. *Roy lugdb.* 67. *Tabaxir & Mombu* arbor. *Bauh. hist.* 1. p. 222. *Ply. Bheed. mal.* I. p. 25. t. 16.

*Habitat in India utraque.*

*Paniculae Scopus rectus, rigidus, gerens ad alternos dentes Saepius Flores tres, alternatim S. distiche positos, sessiles, rigidulos, lineares, longos."*

<sup>1)</sup> My personal acquaintance with the vegetative and reproductive structures of the plant here discussed may be documented by herbarium specimens preserved at the U.S. National Herbarium under McClure No. 21334; 21334 1/2; 21334 1/3.

<sup>2)</sup> According to the third (1935) edition of the International Rules of Botanical Nomenclature (Art. 68 on p. 21) specific epithets are tautonymous, and to be rejected, when they exactly repeat the generic name. Although the two elements joined in the name *Bambusa Bambos* have the same root, it is maintained that, owing to the difference in spelling, which has a valid historical basis, the specific epithet does not exactly repeat the generic name, and therefore is not tautonymous.

Linnaeus gives a description<sup>1)</sup> under the name *Arundo Bambos* for the first time in this, the second edition of his *Species Plantarum*. His description is based, presumably, on the one flowering specimen in his herbarium labeled "1. *Bambos*". I believe, however, that this specimen has nothing to do with *Arundo Bambos* L. Sp. Pl. 81, 1753, sensu stricto, because: 1. It was not there at the time of the publication of the first edition of the *Species Plantarum*; 2. It is a different species, from the one Linnaeus had principally in mind at the time of publication of the first edition of the *Species Plantarum* (vide supra); and 3. It is a Chinese bamboo which has never been found in India.

The identification of bamboos by means of flowering materials alone is almost always a more or less hazardous undertaking, but I was forcibly struck, upon seeing the aforementioned specimen in Linnaeus' herbarium, by its close resemblance to flowering material of some phases of a bamboo which I had collected repeatedly on Honam Island, near Canton, China. Pursuing the matter, I found very considerable evidence of a circumstantial nature to indicate that Linnaeus' specimen did, indeed, come from Honam Island, China, and not from India, as is generally supposed. The chain of evidence may be summarized briefly as follows:

1. Linnaeus states in the *Lectori Aequo* (unnumbered pages) at the beginning of the first two editions of the *Species Plantarum*, that he had received plant specimens from Peter Osbeck in China.
2. Osbeck states in a footnote (Forster, transl. *Voy.* 1:326) that he received in 1754 (after he had returned to Sweden) some flowers of a small, thorny bamboo which he had seen on Honam Island, China, on Sept. 8, 1751.
3. The flowering specimens mentioned by Osbeck as having been received in 1754 could not have been available to Linnaeus when he was preparing the first edition of his *Species Plantarum* for publication; but they could have reached him in time to receive his attention while he was preparing the second edition.
4. There is, in Osbeck's herbarium at Lund, a mounted sheet of a flowering specimen of a thorny bamboo (*pl. IV*) which I believe to have come from the same source as Linnaeus' specimen. It bears, on the back of the sheet (*pl. V*) the words "E collectionibus Dni. Past. P. Osbeck" and annotations referring to *Arundo Bambos* L., and to the *Species Plantarum*.
5. Linnaeus' specimen "1. *Bambos*" is to me specifically indistinguishable from the one in Osbeck's herbarium.
6. I have examined both of these specimens and they are, in my opinion, specifically indistinguishable from flowering material of some phases of a bamboo which I have collected on Honam Island, China (the

<sup>1)</sup> To the word *Flores* (penult. line) Linnaeus patently, though probably inadvertently, gives the conventional significance "spikelets"; in the first line he calls the same structure *spicis*. What he is referring to, strictly speaking, are ultimate elements of the inflorescence, each consisting of a very short rachis which usually bears two or three bud-subtending bracts and a terminal spikelet. To this structure I apply the term *pseudospikelet* (McClure, *Jour. Wash. Acad. Sci.* 24: 546 & 547, fig. 1, 1934).

type locality of the species) and which I identify as: *Bambusa flexuosa* Munro, Trans. Linn. Soc. 26:101, 1868. Type (in Herb. Munro at Herb. Kew; dupl. in Herb. Brit. Mus.): Hance No. 10,000, "Circa Cantonem, March, 1840." (see *pl. VI*).

If we accept *Arundo Bambos* L. Sp. Pl. 81, 1753 as being based essentially on the large thorny bamboo common in India (*Bambusa Bambos* [L.] Voss), then Linnaeus' treatment (Sp. Pl. 120, 1762) of the flowering specimen in his herbarium is to be understood as based on a misidentification. It would not be strictly correct, therefore, to cite *Arundo Bambos* L. of either edition of the *Species Plantarum* as a synonym of *Bambusa flexuosa* Munro.

Another question that has not been elucidated to my satisfaction in the literature of bamboo is the following: What is *Bambos arundinacea* Retz. Obs. Bot. 5:24, 1789?

As a background for the discussion of this question, and as a source of pertinent evidence, the relevant text is reproduced here in full:

#### 58. BAMBOS

Cum Arundinis genere nihil commune habet, uti floribus patebit. E variis peregrinatoribus Flores habui, sed semper mancos et dissolutos, ita ut characterem extricare impossibile fuerit, donec ramulum melius servatum ab amicissimo KÖNIG acceperim. Nomen Bambos servavi, quia notum, licet barbarum.

*Inflorescentia* Spica disticha multiflora.

*Calyx* squamae plures breves inaequales concavae.

*Flores* plerumque quaterni, caeterum 3—8 in spica vidi.

*Corollae valvula exterior* oblonga, mucronata, convexa, marginibus ad basin non-nihil inflexis, enervia.

[*Corollae valvula interior* planiuscula, lanceolata, marginibus ad angulum acutum inflexis: *Anguli* hi pilosi.

*Stamina filamentis* sex brevissimis, *antheris* linearibus.

Saepe filamentum unum antheram solitariam, secundum duo et tertium tres antheras gerit.

*Pistillum*. *Germen* minimum.

*Styli* breves 2, etiam unicus.

*Stigmata* longa, longitudinaliter plumosa.

#### 1. *Bambos arundinacea*.

*Arundo Bambos* Auctorum.

*Panicola* ramosa, divaricata, dura.

*Spicae* alternatim congestae, numero inaequales, sesiles.

The association of the name *Bambos arundinacea* Retz. (also written *Bambusa arundinacea* Retz., and *Bambusa arundinacea* Willd.) with the common thorny bamboo of India on the one hand, and with the name *Arundo Bambos* L. as a synonym on the other, is a procedure which has had the implied sanction of the majority of important writers on bamboo during the past 150 years or so. This statement may be verified by reference to the following sources: Roxb., Pl. Cor. I: col. 56, 1795; Willdenow, Sp. Pl. 2:245, 1799; Poiret in Lam., Enc. Méth. Bot. 8:701, 1808; Roem. & Schult., Syst. Veg. 7 (2): 1340, 1830; Roxb., Fl. Ind. (ed. 2) 2:191, 1832; Munro, Trans. Linn. Soc. 26:103, 1868; Gamble, Ann. Roy. Bot. Gard. Calcutta 7:51, 1896; Camus, Bambus. 128, 1913; Blatter, Jour. Bom. Nat. Hist. Soc. 33 (4):772, 1929.



One does not lightly undertake to go contrary to such a formidable tradition of usage. The reasons for doing so, however, have been pressing upon my mind insistently for some years, and they will be outlined in detail hereinafter, following some transitional remarks.

Although the name *Bambusa arundinacea* Willd. has been used by most writers as applying to the common thorny bamboo of India, I have encountered no evidence that any of them ever took note of the fact that the specimen which exemplified Willdenow's idea of this species is not the common thorny bamboo of India at all, but is what we know as *Bambusa vulgaris* Schrad. (*pl. VII*). Nor is there any conspicuous evidence that any serious consideration has been given to the fact that Willdenow confused at least two concepts under the name *Bambusa arundinacea* and in so doing led to a misapplication of the name. After all, the binomial *Bambos arundinacea* and the corresponding concept were set up by Retz.

Although there is a remarkable degree of unanimity in citing *Arundo Bambos* L. Sp. Pl. (ed. 2) 120, 1762 as a synonym of *Bambusa arundinacea* Willd., or *Bambos arundinacea* Retz., I have found no evidence that anyone has ever compared a flowering specimen of the common thorny bamboo of India with Linnaeus' specimen (described in 1762) or suspected that the latter was not the common thorny bamboo of India.

Roxburgh (1795, 1: col. 56) seems to have been the first to cite *Arundo Bambos* L. as a synonym of *Bambos arundinacea* Retz. But Willdenow appears to have been the one whose example has exercised the predominant influence, since *Bambusa arundinacea* Willd. is the form of the name more commonly used. In view of this fact, it may be useful to study Willdenow's treatment of the matter. Here is the full text of Willdenow, Sp. Pl. 2:245, 1799, as far as it concerns the name *Bambusa arundinacea*, and the documentation of Willdenow's concept of it.

\* 693. BAMBUSA

Gen. plant edit. Schreb. n. 607

*Squammae* tres spiculas subquinquefloras tegentes. *Cal.* o. *Cor.* glumæ 2-valvis. *Stylus* 2-fidus. *Semen* 1.

1. BAMBUSA *arundinacea*.

*B.* panicula ramosa divaricata. W.

*Bambos arundinacea.* Retz. obs. 5. p. 24.\*

*Nastus.* Juss. gen. ed. Useri p. 39.

*Arundo* (*Bambos*) calycibus multifloris, spicis ternis sessilibus. Sp. pl. 120.

*Arundo arbor.* Bauh. pin. 18. Hort. cliff. 25. Fl. zeyl. 47. Roy. lugdb. 67.

*Arundarbor vasaria.* Rumph. amb. 4. p. 8.

*Tabaxir* s. *Mombu arbor.* Bauh. hist. I. p. 222.

*Illy.* Rheed. mal. I. p. 25. t. 16.

*Houttuyn* Lin. Pfl. Syst. I. p. 229.

Gemeiner *Bambos.* W.

Habitat in India utraque. (v. v. s. fl.)

*Paniculae scapus erectus rigidus, gerens ad alternos dentes saepius flores tres, alternatim s. distiche positos sessiles rigidulos lineares longos.*

Willdenow adopts Schreber's spelling of the generic name and, by inference at least, accepts Schreber's description of the genus, adding a very abbreviated list of presumed diagnostic characters.

The name *Bambusa arundinacea* (without author designation) occupies first position under the genus heading, and is followed by the words

"*B. panicula ramosa divaricata. W.*" Although the signature "W." is Willdenow's, the words are taken, verbatim, from Retzius' description of *Bambos arundinacea*. The next line reads "*Bambos arundinacea* Retz. Obs. 5. p. 24\*." This asterisk corresponds to an asterisk standing before the center heading, thus: "\*693. B A M B U S A." These facts, taken together with Schreber's citation (Gen. Pl. 2:828, 1791, under "Addenda et emendanda": "607. BAMBUSA: *Bambos* Retz. Obs. fasc. 5, p. 24," are construed as providing sufficient basis for choosing *Bambos arundinacea* Retz. Obs. Bot. 5:24, 1789 as the type species of the genus *Bambusa* Schreber, since Schreber made no reference to any other bamboo.

From this point on, the reference (with the exception of the words "Gemeiner *Bambos, W.*" and "[v. v. s. fl.]" which will be discussed below) are, in my opinion, entirely extraneous to the proper concept of *Bambos arundinacea* Retz.

We may leave out of consideration, for our present purpose, Willdenow's inclusion of *Nastus* Juss. and *Arundarbor vasaria* Rumph. in the synonymy, except to quote the comment of the Schulteses (Roem. & Schult. 7 [2]:1341, 1830): "Div. Willdenow confusionem hanc augebat, cum synonymis hisce adhuc BAMB. *arundinacea* Retz., NASTUM Juss. et Arundarborum vasariam Rumph. adscripset."

The abbreviation "(v. v. s. fl.]" is believed to merit special attention. It is taken to stand for "vivum vidi specimen florigerumque" (or something approximating that) which may be freely rendered: "I have seen a living plant and a flowering specimen." The flowering specimen is presumed to be accounted for by the one in his own herbarium, labeled in his own hand, "*B. arundinacea. 1.*" (see *pl. VII*) and resting in a folder labeled "*Bambusa arundinacea* Retz. Observ. 5, p. 24." But what of the plant he claims to have seen?

Wendland (Coll. Pl. 2:28, 1810) says of *Bambusa vulgaris*, then being described: "Diese Pflanze, die unter dem Namen *Arundo Bambos* in den ältern Ausgaben der Spec. Plant. Linn. aufgeführt steht, ist in Europa schon lange bekannt und cultivirt worden." And on p. 29 of the same work he says: "So zeigen sich die hiesigen Schafte, die vor zwölf Jahren mit drey Zoll Dicke im Durchschnitte hervorgekommen sind und noch die nemliche Dicke haben." These statements would lead one to believe that there were, either in the Botanic Gardens or the private gardens of Europe, plants of *Bambusa vulgaris* of mature stature that Willdenow could have seen. I have not encountered any evidence that the common thorny bamboo of India was to be found under cultivation in Europe at that time.

The fact that the name *Arundo Bambos* was associated with this plant in the minds of many of the botanists of the time would help to explain Willdenow's inclusion of "*Arundo (Bambos)* Sp. Pl. 120" in his synonymy. He may have been influenced, subconsciously, by Retzius' citation of "*Arundo Bambos* Auctorum" as a synonym of his *Bambos arundinacea*.

A study of the diverse elements united by Willdenow under the name *Bambusa arundinacea* makes it very obvious that he was (apparently without being aware of it) dealing with at least two distinct entities, namely: 1. the plant familiar today under the name *Bambusa vulgaris* Schrad.; and 2. the common thorny bamboo of India.

As pointed out already, the consensus among subsequent writers has been to the effect that *Bambusa arundinacea* Willd. (*Bambos arundinacea* Retz.) should apply to the second element. It is my considered judgment that it should apply rather to the first.

In the absence of an opportunity to examine Wendland's type, the documentation of my interpretation of the name *Bambusa vulgaris* Schrad. is based primarily on Wendland's original description and figure (Coll. Pl. 2:26, pl. 47, 1810), to which I am able to bring some first-hand knowledge of the living plant presumed to have been described, both in its vegetative and flowering states<sup>1</sup>).

Although less precise and less complete than we would like them to be, Wendland's description and figure are remarkable (considering the date at which they were prepared) and they fit the vegetative and reproductive aspects of the plant in all of the characters treated. Of these, the following are considered diagnostic (in terms of the bamboos that Wendland might possibly have had at that time): *Culm internodes* glabrous, with a brown ring (Note: of hairs, understood) at each joint; the *culm sheaths* pubescent with brown, appressed, persistent hairs (Note: The culm sheath proper is entirely glabrous in the common thorny bamboo of India); the *palea* shorter than the *lemma* (Note: the palea is commonly longer than the lemma in the common thorny bamboo of India); *anthers* brown (Note: the anthers are yellow when fresh, and straw when dry in most species of *Bambusa*, including the common thorny bamboo of India, purplish when fresh, and brown when dry in this species).

It is noteworthy that Wendland makes reference to the culm sheaths, which are rarely, if ever, found in early collections of bamboo. As to the figure (op. cit. pl. 47) the culm habit and branching habit shown are characteristic of the plant in mind. Wendland makes no mention of thorns, and the figure does not show them. He would most certainly have noticed them had he had before him the common thorny bamboo of India — which would have been figured with numerous long, very thorny branches at the base of the culms. Wendland had living plants of his *Bambusa vulgaris* under direct observation, and living plants of the species were common in cultivation in Europe at the time (op. cit. p. 28). I have not found any evidence that any species of *Bambusa* other than the one we know today as *Bambusa vulgaris* was known in cultivation in Europe at that time.

Willdenow apparently attaches considerable importance to the fact "Die Blumen aus dem Wurzelstocke sprossend." but this phenomenon occurs, under certain conditions, in many, if not all, species and genera of bamboos.

Here, then, is a resumé of the evidence that *Bambos arundinacea* Retz. Obs. Bot. 5:24, 1789, was founded on the plant now commonly known as *Bambusa vulgaris* Schrad., and not on the common thorny bamboo of India. It is partly direct and partly indirect or circumstantial.

1. I have not discovered any positive evidence whatever that Retzius

<sup>1</sup>) My personal acquaintance with the vegetative and reproductive structures of the plant here discussed may be documented by herbarium specimens preserved at the U. S. National Herbarium under McClure No. 21274.

had, or even thought he had, as the basis of his *Bambos arundinacea*, anything corresponding to the common thorny bamboo of India.

2. Retzius makes no mention of Linnaeus or of *Arundo Bambos* L. His citation of "*Arundo Bambos* Auctorum" may have indicated that he did not consider his plant to be the same as the one Linnaeus had principally in mind. Perhaps he was uncertain, and if so he showed laudable discretion in not citing Linnaeus. Some authors (cf. Ham., 1822, p. 478) have inferred that Retzius took the word *Bambos* from Linnaeus. Retzius says merely, "Nomen Bambos servavi, quia notum, licet barbarum."

3. Retzius says that he had an unusually good specimen sent him by his friend König, but he does not mention its geographical origin. This specimen, unfortunately, is one of several of Retzius' types that are missing from the Retzius herbarium at Lund (teste Fischer, Kew Bull. Misc. Inf. 1932, pp. 50 & 76). However, I saw, in 1935, in the Herbarium of the British Museum, an ample specimen of *Bambusa vulgaris* Schrad., in good condition, bearing the words "J. B. König<sup>1</sup>" and "Ind. Orient." This probably was not Retzius' type, but it may well have been a part of the type collection. Ample flowering specimens of this species are perhaps more distinctive and susceptible of positive identification than those of any other known species of *Bambusa* (see discussion of distinctive characters below).

4. I have seen all of the bamboos of Willdenow's herbarium. In the folder bearing the words "*Bambusa arundinacea* Retz. Observ. 5, p. 24." there is but one flowering specimen, and it is labelled "*B. arundinacea* 1." in Willdenow's hand. This specimen is *Bambusa vulgaris* Schrad., and not the common thorny bamboo of India.

5. Retzius' description (that of his genus and his species taken together) applies much better, on the whole, to *Bambusa vulgaris* Schrad. than it does to the common thorny bamboo of India. The only statements that strike me as not being applicable to *Bambusa vulgaris* are "Corollae valvula exterior [i. e., the lemma] ... enervia." and "Styli ... 2 ...". Whatever may have been the basis of these statements (perhaps they were the result of faulty observations, or simply slips of the pen) neither of them may truly be said to apply to the common thorny bamboo of India.

6. Retzius' words, "Corollae valvula exterior [i. e., the lemma] marginibus ad basin nonnihil inflexis..." and "Stamina filamentis sex brevissimis ... Saepe filamentum unum antheram solitariam, secundum duo et tertium tres antheras gerit." seem to me to have special significance.

The basally inflexed margins of some of the lemmas, mentioned by Retzius, are thought to have been called to his attention by the distinctive appearance assumed by some of the spikelets in this species (and definitely related to the behaviour of the lemmas), an appearance which is due to the tendency of the florets on the two sides of the spikelet to separate from each other, giving the affected spikelet a "double" or twinned aspect. The condition described serves as a char-

<sup>1</sup> König's initials are given in Pritzel as "J. G."; by Fischer (op. cit. p. 47) as "F. G."

acter useful in the identification of flowering material of *Bambusa vulgaris* Schrad.!

A full appreciation of the special significance of the other statements quoted depends, as I believe, upon illumination which can be supplied only by careful dissection, and careful comparison of, the florets of *Bambusa vulgaris* and those of the common thorny bamboo of India.

In his statement concerning the stamens, Retzius refers to the filaments as being very short. This indicates clearly that he was describing the parts of an immature floret that had not yet reached the stage of anthesis. This being true, the statement "styli breves", which has been singled out (Schultes 1830, p. 1340) as applying especially to the thorny bamboo of India, may be accepted as applying to *Bambusa vulgaris* in the present case. The remarkable statement, "Saepe filamentum unum antheram solitariam, secundum duo et tertium tres antheras gerit" refers with singular aptness to a condition commonly encountered in the florets of *Bambusa vulgaris*. I found it in dissecting a single floret of Willdenow's specimen referred to above. It is based on the fact that the rather flat, immature filaments tend to cohere in groups, giving exactly the effect described. The same type of cohesion may be found in the filaments of this species even after anthesis, though it is not so complete then.

We have, then, as a logical expression of the facts and views stated above:

***Bambusa arundinacea* Retz.** (as *Bambos*) Obs. Bot. 5:24, 1789.

Type: "König." Missing from the Retzius Herbarium at Lund; (teste Fischer, op. cit. pp. 50 & 76). A specimen in the Herbarium of the British Museum, examined by the writer in 1935, bore the annotation, "J. B. König, 7, Ind. Orient." and is confidently identified as this species. It may have come from the type collection.

Syn.: *Bambusa vulgaris* Schrad. ex Wendl. Coll. Pl. 2:26, pl. 47, 1810; more fully described and illustrated by Gamble, Ann. Bot. Gard. Calcutta 7:43, pl. 40, 1896. (Type not seen).

*Bambusa Thouarsii* Kunth, Rev. Gram. 2:323, pl. 73 & 74, 1830. (Photo and fragment of type, in Herb. Nat. Hist. Mus. Paris, examined at U. S. Nat. Herb.)

*Bambusa surinamensis* Rupr. Mém. Acad. St. Pétersb. VI. Sci. 3 (1): 139, pl. 11, f. 49, 1839. (Photo and fragment of type, in Herb. Leningrad, examined at U. S. Nat. Herb.)

The implications of the facts and views stated immediately above, and those stated earlier in this paper (see *Bambusa Bambos*, p. 95) may well be disturbing to many who read them. It is probable that the acceptance of the name *Bambusa Bambos* (L.) Voss in place of either *Bambusa arundinacea* Willd., or *Bambusa arundinacea* Retz. (as *Bambos*), for the common thorny bamboo of India, will come naturally and easily for those who are familiar with the factual and logical basis for it. — But what of the displacement of the universally known name *Bambusa vulgaris* Schrad. (as applied to a well-known plant) by the name *Bambusa arundinacea* Retz.?

The fact that the misapplication of the name *Bambusa arundinacea* Retz. (as *Bambos*), or *Bambusa arundinacea* Willd., to the common thorny bamboo of India has been in vogue for 150 years, renders the reinvest-

ment of the name, with its original meaning very difficult to accomplish. One aspect of the difficulty is the probability that for some years, at least, the majority of persons dealing with the common thorny bamboo of India (properly called *Bambusa Bambos* [L.] Voss) will continue to call it *Bambusa arundinacea*, either because they are not acquainted with the facts, or because they do not agree with the conclusions based thereon. Those who wish to use the name *Bambusa arundinacea* Retz. (as *Bambos*) in its original sense might avoid being misunderstood by always citing *Bambusa vulgaris* Schrad. as a synonym. It may be that the consensus of leadership will be to avoid altogether the use of the name *Bambusa arundinacea*, and its variants, simply because of the risk of being misunderstood, and to continue the use of the name *Bambusa vulgaris* Schrad., which is generally accepted in its proper sense. In any case, spoken usage will lag behind the written.

Now, having clarified somewhat (as I hope!) the concepts of the specific entities involved in the early history of the genus, and having considered logical and reasonable adjustments in the use of specific names, let us consider some questions pertinent to the genus itself: Whom shall we accept as the author of the genus; what spelling shall we adopt for the name of the genus; what shall be type, or standard, species of the genus; and how shall we define the concept of the genus in terms of our present knowledge?

Retzcius' description of his genus *Bambos* has already been examined, and judged to have been based on a specimen of a plant which has since become widely known as *Bambusa vulgaris*. Now let us consider the description of *Bambusa* Schreber, Sp. Pl. 1:236, 1789:

\* 607. BAMBUSA Schreb.

CAL. nullus, nisi *Bracteeae* glumaceae, vagae, sub singulis spiculis saepe ternae, oblongo-ovatae, acuminatae, concavae, carinatae, inaequales, flosculi breviores: duae oppositae, tertia lateri plano spiculæ incumbens.

*Spiculæ* lanceolatae, distichae, compressae, acutae, subquinqueflorae.

COR. *Gluma* bivalvis. *Valvula inferior* oblonga, ventricosa, acuminata, apicem versus carinatae striataeque. *Interior* lanceolata, plana, (marginibus complicatis), ciliata, inferiore paulo longior & ex ea prominens.

*Neotarium* diphyllum, planum, ad latus anticum germinis; *foliis* ovatis, acuminatis, apice barbatis, membranaceis.

STAM. *Filamenta* sex, capillaria, fere longitudine corollae.

*Antherae* parallelepipedae, basi bifidae.

PIST. *Germen* oblongum. *Stylus* capillaris, bifidus. *Stigmata* plumosa.

PER. nullum. *Corolla* fovet semen — dehiscit? demittit?

SEM. unicum, oblongum.

OBS. *Flosculi superiores in pluribus spiculis, a me examinatis mere masculi erant; an itaque hoc genus in Polygamiam transferendum?* S.

Addenda et emendanda (op. cit. p. 828, vol. 2):

607. BAMBUSA. *Bambos* Retz. fasc. 5. p. 24. Lin. 8, leg. carinata striataque.

Schreber's description applies well to *Bambusa vulgaris* Schrad. in all respects except the following:

1. "*(Valvula) interior* [i. e., lemma] ... inferiore paulo longior & ex ea prominens." This statement is more correctly applicable to the condition commonly found in florets of the common thorny bamboo of India than to the condition commonly found in those of *Bambusa vulgaris*.

However, among many specimens of the latter species which I have examined, it was not unusual to find a few florets with paleas appreciably longer than the lemmas. So it is possible that Schreber may have found the condition he describes in a specimen of *Bambusa vulgaris*.

2. "*Nectarium* [i. e., *lodiculæ*] *diphyllum*... *foliolis*... *acuminatis*." This does not apply, strictly speaking, to either *Bambusa vulgaris* or the common thorny bamboo of India. It is probable that Schreber overlooked the third lodicule, which has not been reported wanting in any true *Bambusa*. The term "acuminate" applies to the third, or posterior, lodicule typically present in the florets of both *Bambusa vulgaris* and the common thorny bamboo of India.

As against the foregoing two statements, let us balance the following two statements in Schreber's description that apply with much more obvious appropriateness to the florets of *Bambusa vulgaris* than to those of the common thorny bamboo of India: "*Valvula inferior* [i. e., *lemma*] ... *apicem versus carinata striataque* [as corrected in the footnote]" and "*(Valvula) interior* [i. e., *palea*] ... *plana*..."

It is difficult to say, with complete confidence, on the evidence provided by the description alone, which species (one or more) Schreber may have had before him when he made his dissections and drew up the document. Incidentally, it would be helpful, in evaluating his statements, to know how many florets he dissected! He probably had *Bambusa vulgaris*. He could, conceivably, have had both *Bambusa vulgaris* and the common thorny bamboo of India. While not in itself conclusive evidence against the likelihood that he had the latter species, the fact that he made no mention of thorniness, and that he did not cite *Arundo Bambos* L. as belonging to his genus, is worthy of notice at this point. Is it hardly likely that he had a third species. *Bambusa verticillata* Willd. Sp. Pl. 2:245, 1799 might have been available to him, but it evidently was not, since he does not mention the monadelphous stamens which are principally responsible for this species having been made the basis of the genus *Gigantochloa* Munro, Trans. Linn. Soc. 26:123, 1868. I have not had an opportunity to search Schreber's herbarium, or to examine the specimen, or specimens, on which he may have based his description.

However, there is convincing, though not very conspicuous, evidence that the *Bambusa* Schreb. and *Bambos* Retz. not only are synonymous, but are based on the same species, namely the plant widely known as *Bambusa vulgaris* Schrad. On the first point we have the evidence presented by Schreber himself (Gen. Pl. 2:828, 1791) in citing "*Bambos* Retz. fasc. 5, p. 24." as a synonym of his own *Bambusa*. On the second point, the evidence is of an indirect nature. It is to be expected, psychologically speaking, that a work entitled "Linnaeus Genera Plantarum" would deal first of all with plants with which Linnaeus himself had had some connection. And presumably at the time of the publication of the first volume of Schreber's edition of the "Genera" no bamboo name (in the Linnean sense) had appeared save *Arundo Bambos* L. The plant we know as *Bambusa vulgaris* had not generally been recognized as distinct. However, *Bambusa vulgaris* was commonly cultivated in Europe under

the name *Arundo Bambos* (teste Wendland, 1810, p. 28), and I dare say it was commoner in European herbaria than specimens of the "common thorny bamboo of India." Furthermore, although Schreber must have drawn up his description on the basis of an actual flowering specimen, he makes no mention of thorns — a character he would almost certainly have noticed had he had a specimen of the common thorny bamboo of India. His description shows no sign of having been based on that of Linnaeus, or influenced by it. And finally, it is considered significant that he does not make any reference to Linnaeus' writings.

*Bambos* Retz. and *Bambusa* Schreb. were both published in the same year, 1789. I have not been able to obtain basic evidence as to which appeared earlier, so I am not prepared to propose a choice between the two on the basis of priority. Kunth's statement (Jour. Phys. 95:148, 1822): "Retzius (Obs. bot., V, p. 24) fut le premier qui reconnut que l'*Arundo bambos* de Linné devait former un genre particulier. Il le designa sous le nom de *Bambos*, que Schreber changea en celui de *Bambusa*" affords no documentation and could have been based on personal opinion induced by the identity of Retzius' generic name with Linnaeus' specific name, *Bambos*. It may be that further research will reveal basic evidence of the correctness of Kunth's statement. Aside from the matter of priority, however, Retzius described a species under his new genus (which Schreber did not), thus satisfying a standard adopted by modern botanists that a genus be based on a type species (Recom. IV & V, Intl. Rules Bot. Nom., 1935). There is some precedent for the adoption of the name *Bambos* Retz.: Roxb., Pl. Corom. 2: col. 56, 1795; Poir. in Lam., Enc. Méth. Bot. 8:704, 1808; Sieb., Syn. Pl. Econ. 5—6, 1827; Hitchcock, Contr. U. S. Nat. Herb. 17:387, 1913. Attempts to establish this usage have not been successful, however, and the preponderance of usage follows Schreber.

In view of the desirability of minimizing changes in widely used nomenclature, so far as possible without doing violence to logic or reason, it seems appropriate to see what can be done to preserve a usage so well established as that of *Bambusa* Schreber. It is to be expected that such a step would meet with the approval of the majority of botanists and plantmen who have an interest in the matter.

In anticipation of favorable action by the next International Botanical Congress, of a proposal to conserve the name *Bambusa* Schreber, and in consideration of the practical reasons in favor of continuing the usage so widely followed in the literature of botany and horticulture, my judgment in the matter is given expression as follows:

#### BAMBUSA Schreb.

Type species: *Bambos arundinacea* Retz. (= *Bambusa vulgaris* Schrad.).

*Bambos* Retz. Obs. Bot. 5:24, 1789. Type species: *Bambos arundinacea* Retz.. A single species is described. The name has been consistently misapplied, for 150 years, to the common thorny bamboo of India (properly called *Bambusa Bambos* [L.] Voss), whereas it was based originally on the plant we now know as *Bambusa vulgaris* Schrad.



*Bambusa* Schreb., Gen. Pl. 1:236, 1789. Type species: Schreber mentions no species, but cites in the Addenda & emendanda" (op. cit. 2:828, 1791) "*Bambos* Retz. fasc. 5, p. 24." For this and other reasons (note the asterisks connecting the names "*Bambusa* Schreb." and "*Bambos arundinacea* Retz." in Willdenow, Sp. Pl. 2:245, 1799), the plant originally represented by the name *Bambos arundinacea* Retz. is chosen as the species most logically to be considered as typifying the genus. This is the plant we now know as *Bambusa vulgaris* Schrad. The name *Bambos arundinacea* Retz. is likely to be misunderstood, having been mistakenly associated for 150 years with the plant properly called *Bambusa Bambos* (L.) Voss.

*Ischurochloa* Buse in Miq., Pl. Jungh. 389, 1854. Type species: *Bambusa spinosa* Roxb.. Buse (op. cit. p. 390) describes two species: *I. spinosa*, based on *Bambusa spinosa* Roxb., and *I. floribunda*, based on an herbarium name, *Bambusa floribunda* Zoll., apparently here published for the first time (cf. *Bambusa floribunda* Zoll. ex. Steud. in Zoll. Syst. 57, 1854). Besides being a known species, *B. spinosa* Roxb. is believed to have been the one Buse had "chiefly in mind" (See Hitchc. 1936, p. 2, footnote 1a) since he placed it in the first position.

*Leleba* Rumph.; Nakai, Jour. Jap. Bot. 9:9 et seq. 1933. Descr. in Japanese. Type species: *Ischurochloa floribunda* Buse. Twelve species and several varieties are transferred, principally from the genus *Bambusa*. The first is taken as the type of the genus. A latin diagnosis is given for the first time in a key to the bamboo genera of Japan (Nakai, Flor. Syly. Koreana 20:13, 1933). Assuming the common thorny bamboo of India to be the species of *Bambusa*, Dr Nakai proposes to separate *Leleba* from *Bambusa* by two characters presumed to be diagnostic: "Nodes of the branches never thorny", and "Base of the style not thickened", and in doing so sets up a boundary for which I have not been able to find a sound or consistent basis in the plants themselves, or in the structures mentioned.

Referring to the second character first, in all of the species of *Bambusa* (in the sense adopted in this paper) whether conspicuously or weakly thorny or entirely unarmed, the fruits of which are familiar to me, the pericarp becomes progressively thickened and hardened at the summit of the developing ovary, which narrows abruptly into the base of the style. When the fruit fails to reach full development, a condition very commonly encountered in herbarium specimens, the lower part of the fruit, being enveloped in thin, soft pericarp, shrinks upon drying, while the upper part of the fruit, enveloped in hard pericarp, retains its original size and shape. The effect conveyed, if one does not consider the relevant facts and antecedent events, may be that the base of the style is thickened (cf. Ruprecht, 1839, pl. 13, fig. 51 & 53). It is to this feature, which is common to all of the species involved, that Dr Nakai is presumed to be referring in setting off *Bambusa* from *Leleba* by the thickened base of the style.

The character "Nodes of the branches never thorny", and its opposite, "Nodes of the branches retrorse-thorny", are ones to which some bamboos do not conform unequivocally (cf. *Bambusa dissimulata* McClure, and *Bambusa malingensis* McClure).

Here is an emended description of the genus. Since those known species with scandent culms, which have been described under the genus *Bambusa* are, on other grounds, to be excluded from the genus, the present concept does not include a climbing culm habit:

The plant, a solitary (i. e., discrete), caespitose, usually more or less densely crowded, sometimes rather open, cluster (*clump*) of culms arising from a close-knit rhizome system, the basic *rhizome* unit consisting of very short, non-fistulose internodes and non-prominent nodes, with a very short, slender, basal, budless, rootless, *neck*, and a thick, generally horizontal, bud-bearing, root-bearing strictly determinate axis (the rhizome proper) terminating shortly in a more or less erect aerial axis (*culm*), the latter with more or less elongate, fistulose (and with the lumen thinly lined with pith), cylindrical or subcylindrical *internodes*, these sometimes more or less strongly depressed for a short distance above the point of insertion of the branches (especially in the middle and upper part of the culm); *nodes* of the culm of variable prominence (the secondary ridge usually lacking or inconspicuous), usually all gemmiferous, the lower ones exceptionally (in as much as one third of the length of the culm in mature plants of *B. textilis* McClure) without buds, the *buds* solitary (one at each node), each enclosed in a prophyllum (the lower nodes of the culm usually bearing a ring of root primordia, these sometimes spine-like); *culm sheaths* variable, usually promptly deciduous, sometimes tardily so, occasionally persistent at the lower nodes, the auricles and oral setae usually well developed one or the other occasionally lacking entirely (both lacking in *B. flexuosa* Munro), the *sheath blade* (pseudophyll) appressed or more or less strongly reflexed; *branches* often undeveloped at the lower nodes in culms of mature plants, spiniferous in various degrees (by modification or dwarfing of branches of higher order) or entirely unarmed, sometimes solitary in the lower part of the series, the principal (middle) one usually relatively heavy and long (sometimes only weakly dominant, as in *B. textilis*, and perhaps more or less so in some other species), the more or less bulbous base consisting of a few much shortened internodes, this usually flanked, in the middle of the culm at least, by 1—2—more pairs of successively shorter and more slender branches (sometimes, as in *B. flexuosa* the principal branch flanked in the middle of the series by a single somewhat weaker one), the branches progressively shorter, more slender and more nearly equal toward the tip of the culm, all as a rule repeatedly branching; *leaf blades* with predominantly parallel venation, the transverse veins usually lacking entirely, or obscure, occasionally apparent in a part of one or both surfaces (as in *B. vulgaris* Schrad.), but always more or less obliquely oriented and irregularly spaced. *Inflorescences* consisting of solitary or more or less densely aggregated, sessile or subsessile pseudospikelets lateral or apparently terminal to leafy or leafless axes, all but the terminal ones subtended by a basal prophyll; *bracts* subtending vegetative buds (sometimes mistaken for sterile basal florets) usually 1—3, closely set on a very short non-disarticulating *rachis*, bearing terminally an apically indeterminate, usually deciduous, spikelet; *glumes* (empty) 0—2—more; *florets* several to many, the uppermost one or more not completely developed, therefore non-functional; *rachilla segments*

usually disarticulating above or below or between the glumes and at the base of each floret; *lemma* resembling the empty glumes but generally larger and slightly more specialized; *palea* 2-keeled, usually more or less reduced in the lowest 1 or 2 florets; *lodicules* usually 3; *stamens* typically 6; *style* slender, fragile, with a hard, persistent base, and terminating above in 1—3 slender, plumose *stigmas*; *fruit* a dry, starchy, oblong caryopsis with a longitudinal groove or sulcus on the side next to the palea, the pericarp usually more or less closely adnate, thin below, thickened and indurate at the summit of the fruit.

### Summary.

The name *Arundo Bambos* L. Sp. Pl. 81, 1753, is interpreted as properly belonging to the common thorny bamboo of India; therefore this species should be called *Bambusa Bambos*<sup>1)</sup> (L.) Voss. *Arundo Bambos* L. Sp. Pl. ed. 2, 120, 1762, insofar as it is represented by Linnaeus' specimen labeled "1. Bambos" and by his description of this specimen, is based on a misidentification of a Chinese species: *Bambusa flexuosa* Munro (1868).

*Bambos arundinacea* Retz. Obs. Bot. 5:24, 1789, is shown to have been based on the plant known today as *Bambusa vulgaris* Schrad. ex Wendl. (Coll. Pl. 2:26, pl. 47, 1810), and not on the common thorny bamboo of India, properly called *Bambusa Bambos* (L.) Voss.

*Bambusa arundinacea* Willd. Sp. Pl. 2:245, 1799, is based on *Bambos arundinacea* Retz., but Willdenow is shown to have confused, in his text, as in his mind, at least two species under this name: 1. The plant which has since come to be known as *Bambusa vulgaris* Schrad. (of which he had a specimen labeled "*B. arundinacea* 1.") and 2. The common thorny bamboo of India (properly called *Bambusa Bambos* [L.] Voss) of which he had no specimen. Traditional usage for 150 years has overlooked the facts in this case, and has erroneously applied *Bambusa arundinacea* Willd., and *Bambusa arundinacea* Retz. (as *Bambos*) to the common thorny bamboo of India. As a result of the long-continued misapplication of the name *Bambos arundinacea* Retz. and its variants, it will be exceedingly difficult to reinvest the name with its original meaning. It may come to pass that consensus of leadership will be to avoid the use of the name *Bambos arundinacea* Retz. and its variants altogether, at least for some time, because of the risk of being misunderstood, and to continue the use of the name *Bambusa vulgaris* Schrad., which is generally accepted in its proper sense. Those who use *Bambusa arundinacea* Retz. (as *Bambos*) or any of the other variants of the name, may be able to avoid being misunderstood by citing *Bambusa vulgaris* Schrad. as a synonym. *Bambusa* Schreb. Gen. Pl. 1:236, 1789, and *Bambos* Retz. Obs. Bot. 5:24, 1789, are synonymous, and are believed to have been based on the same species, namely the plant commonly known today as *Bambusa vulgaris* Schrad. Strict adherence to Recommendations IV and V of the fifth edition of the International Rules of Botanical Nomenclature, and probably the claims

<sup>1)</sup> Cf. note 2 on p. 95.

of priority, would indicate the replacement of *Bambusa* Schreb. by *Bambos* Retz. The continuation of the use of the generic name *Bambusa* Schreb., instead of *Bambos* Retz., has the sanction of tradition, and of contemporary preference; but in order to be fully justified and stabilized, this usage should be regularized and legalized by action of the International Botanical Congress, placing *Bambusa* Schreb. on the list of *Nomina Conservanda*. The genus *Leleba* Rumph. ex Nakai, Jour. Jap. Bot. 9: 9 et seq. 1933, is added to the recognized synonymy of *Bambusa* Schreb.

*Pl. I and II.* Rhede's Hortus Malabaricus — edition of 1686, not mentioned by Pritzel: Title page and illustration of the thorny bamboo, Ily; taken as the most satisfactory available original documentation of *Arundo Bambos* L. Sp. Pl. 81, 1753. (See p. 110—111).

H O R T I  
M A L A B A R I C I  
P A R S P R I M A,  
D E V A R I I G E N E R I S  
A R B O R I B U S  
E T  
F R U T I C I B U S S I L I Q U O S I S

*Latinis, Malabaricis, Arabicis, Braclimanum ebar asteribus nominibusque expressis,*

Adjecta Florum, Fructuum, Seminumque nativæ magnitudinis vera delineatione,  
colorum viriumque accurata descriptione,

A D O R N A T A

*Per Nobilissimum ac Generosissimum D. D.*

HENRICUM VAN RHEDE TOT DRAAKESTEIN,

Toparcham in Mydrecht, quondam Malabarici Regni Gubernatorem supremi Confessus apud Indos  
Belgis Senatorem Extraordinarium, nunc vero Equestris Ordinis nomine Illustris ac  
Præpotentibus Provinciæ Ultrajectinæ Proceribus adscriptum,

E T

THEODORUM JANSON. AB ALMELOVEEN, M. D.

*Notis adauxit, & Commentariis illustravit*

J O A N N E S C O M M E L I N U S.



A M S T E L A E D A M I.

Sumptibus Viduæ JOANNIS van SOMEREN, Hæredum JOANNIS van  
DYCK, HENRICI & Viduæ THEODORI BOOM.

Anno c1o 1o c Lxxxvi.

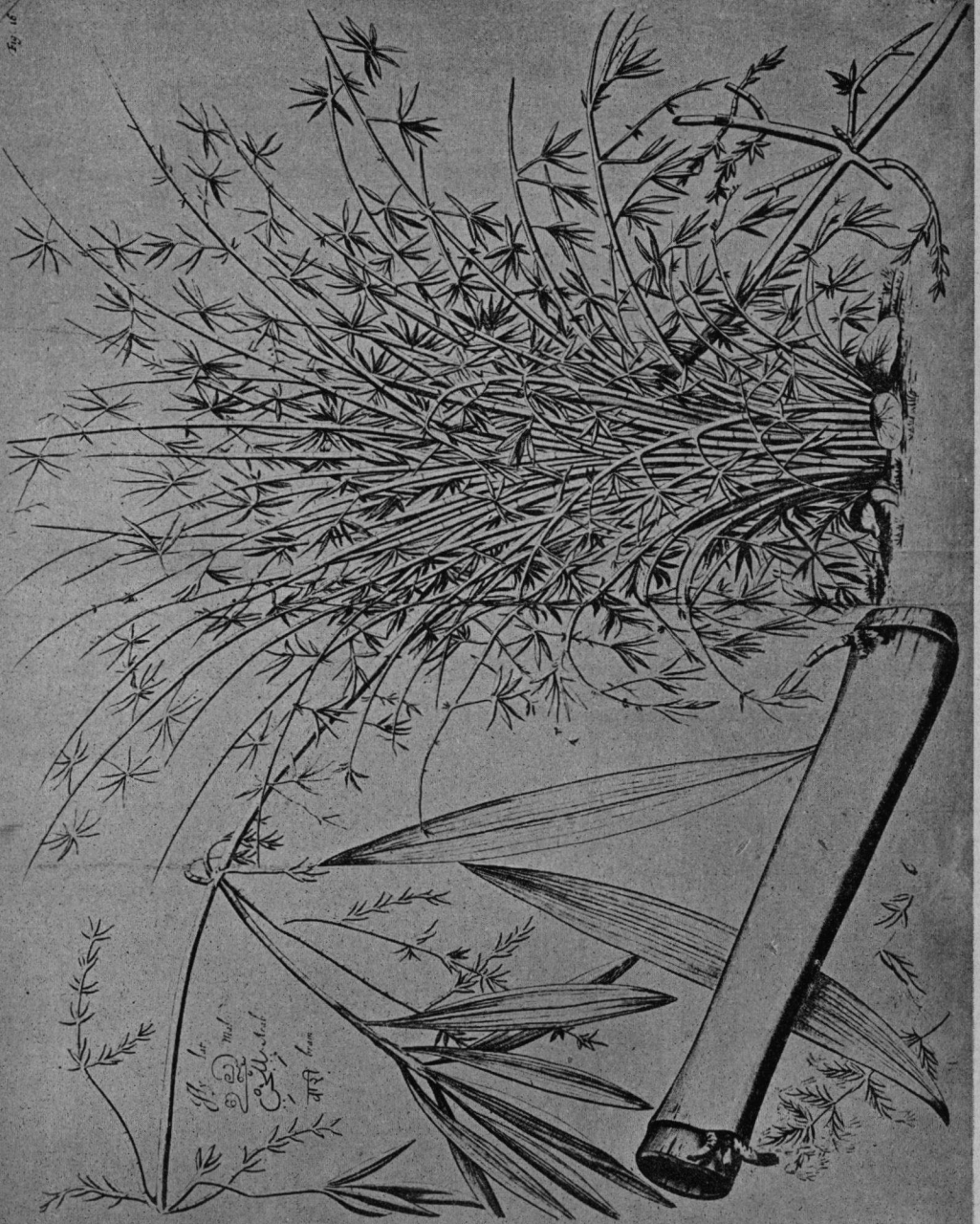


Plate II.

## Legend to Plates III—VII.

*Pl. III.* Specimen labeled (but misidentified, see text) by Linnaeus, "1. Bambos" — the first sheet in the *Arundo* folder in the Herbarium of the Linnean Society, London. It is here identified for the first time as *Bambusa flexuosa* Munro, the specimen having reached Linnaeus, after 1754, from Honam Island, near Canton, China, through the agency of Osbeck.

*Pl. IV.* Retzius' specimen of *Bambusa flexuosa* Munro, presumed to be from the same collection as Linnaeus' specimen shown in pl. III. The leafy twig is extraneous, being from a species of *Phyllostachys* with tessellate-veined leaves.

*Pl. V.* Annotations on the back of Retzius' sheet (cf. pl. IV):

"*Arundo arbor.* / Linn. Spec. Plant. 81. 1. / Flor." is believed to be the earliest — later emended by crossing out the words "Flor." and "81. 1." and adding "Bambos. 120. 1." The next written, presumably, is "ARUNDO (Bambos) calycibus multifloris, spi- / cis ternis sessilibus. Sp. Pl. ed. 2, p. 120, n. (the last letter illegible) / Habitat in India utraque. / E collectionibus Dni Past. P. Osbeck." Most recent are believed to be "Herb. Montinii" and "*Bambusa arundinacea* Willd."

*Pl. VI.* Type of *Bambusa flexuosa* Munro, Trans. Linn. Soc. 26: 101, 1868. "From the Herbarium of the late Gen. Wm. Munro, C. B., 1880" now in the Herbarium of the Royal Botanic Gardens, Kew. "China — circa Cantonem, March, 1840."

*Pl. VII.* Specimen from the herbarium of Willdenow, resting in a folder bearing, in Willdenow's hand, the words "Hexandria Monogynia / *Bambusa arundinacea* Retz. observ. 5. p. 24. / Habitat in India." The sheet (the only flowering specimen in the folder) bears the words "*B. arundinacea* 1." and "W." also in Willdenow's hand. Although this plant is now widely known as *Bambusa vulgaris* Schrad., it is believed that Willdenow's identification is correct.

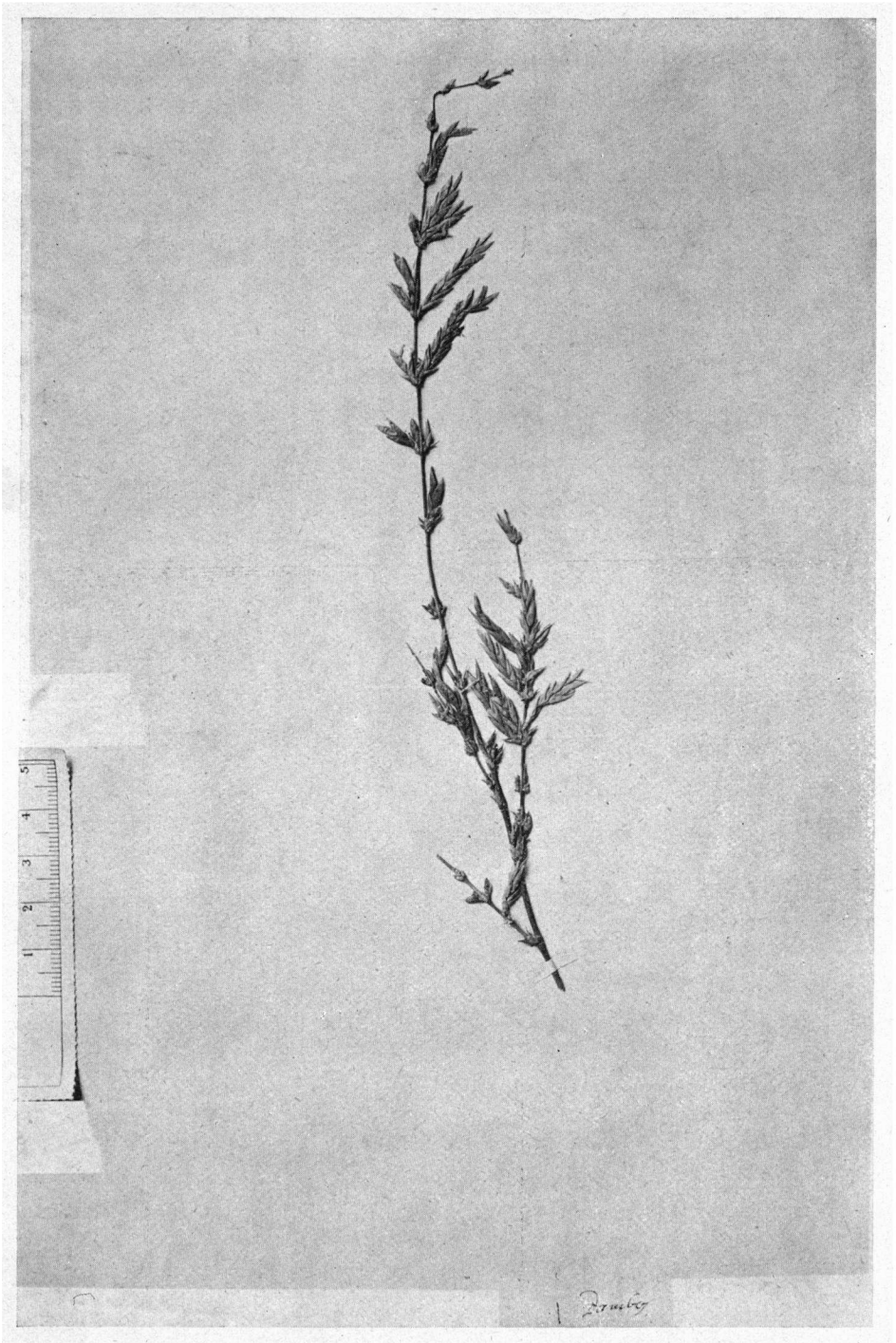


Plate III.





Plate IV.

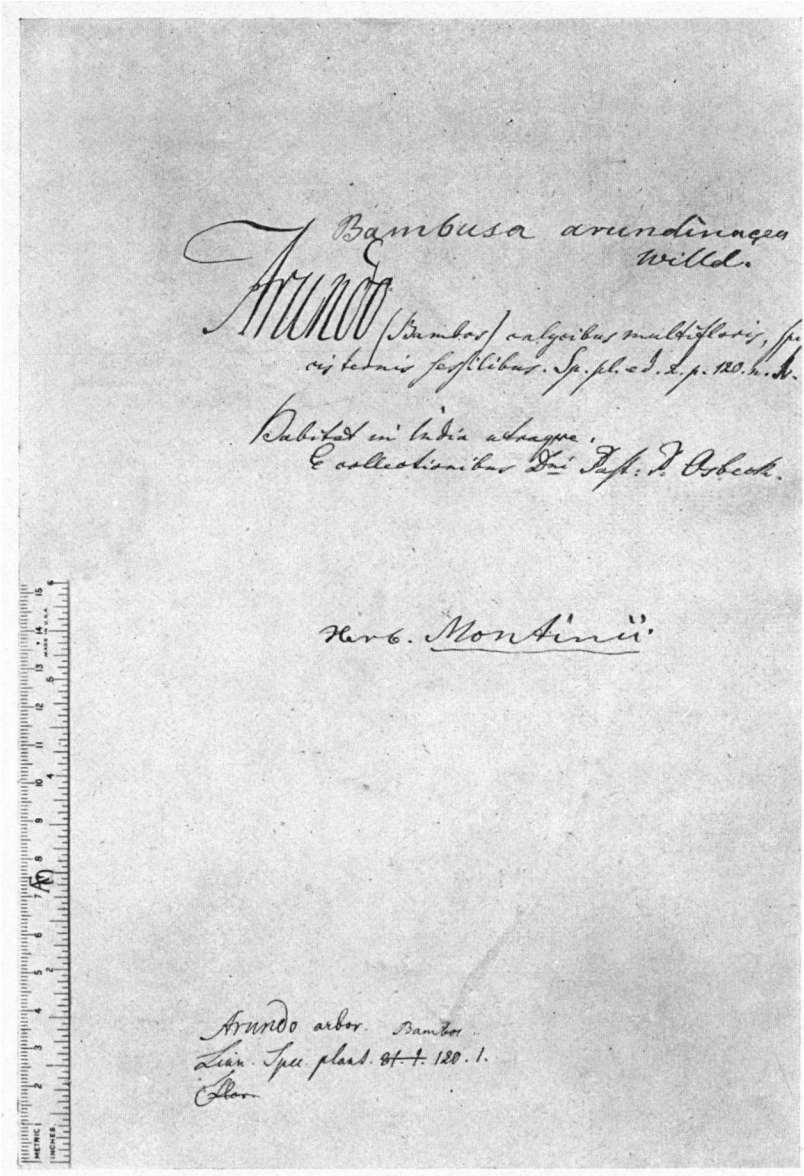


Plate V.

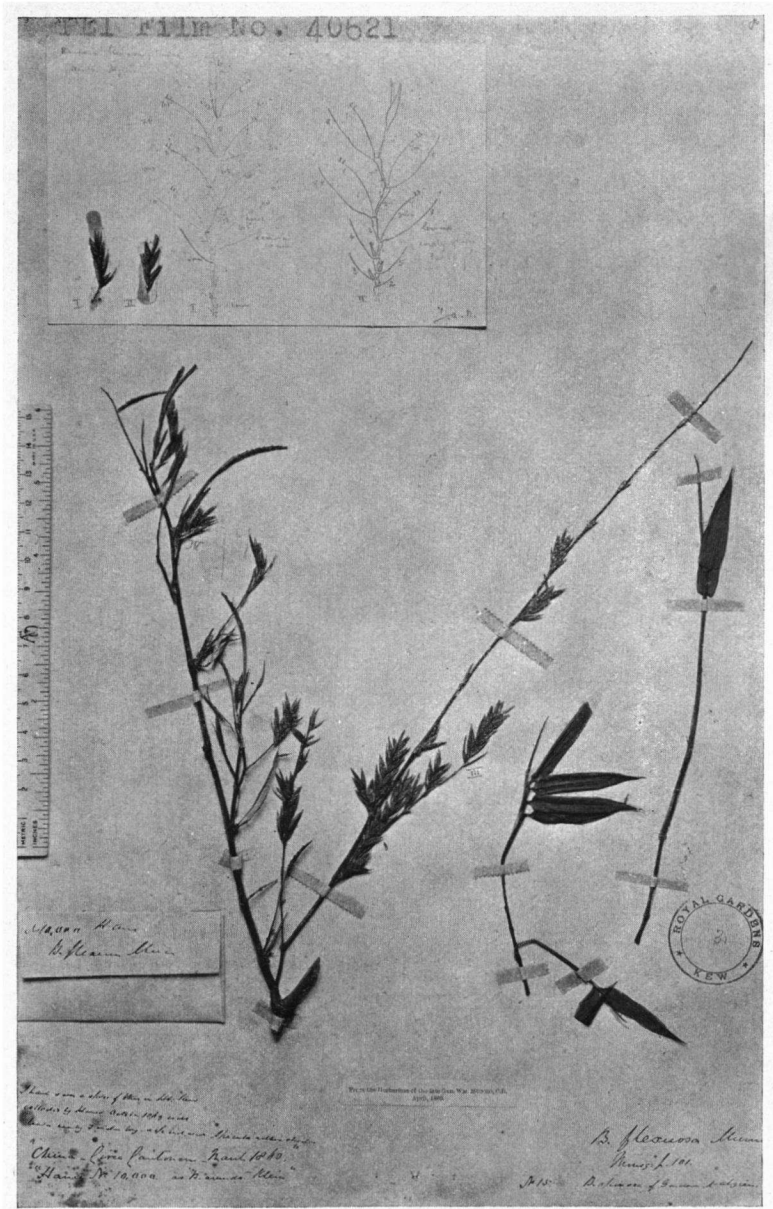


Plate VI.



Plate VII.