de altura, y se llama vuelo nupcial. Para ello se necesita que la temperatura ambiente sea favorable, por lo menos de 14° centígrados. Entonces sale del colmenar la reina joven y los zánganos vuelan en pos de ella. El macho más rápido y constante en su vuelo es el elegido: con esto se verifica una verdadera selección sexual. Este apareamiento termina siempre con la muerte del zángano.

Durante la cópula la reina recoge la *spermatophora* dentro de sí, y como al penetrar el *penis* dentro de la vagina esta spermatophora revienta (*c* y *f* de la ilustración 5), la emulsión espermatoide llena los oviductos. Por los cuernecillos copulatrices (*g* de la figura Nº 5) el penis queda sujeto dentro de la vagina; así al retirarse el órgano masculino de la generación se destroza, lo que acarrea la muerte del macho. El penis arrancado al macho cierra la salida de la vagina y así la emulsión espermatoide no puede derramarse al exterior.

Por movimientos contráctiles del aparato sexual de la hembra entra entonces dicha emulsión al receptáculo seminal. (*d* de la figura Nº 4). En el receptáculo seminal los espermatozoarios conservan la vitalidad por varios años: por eso la reina es capaz de fecundar huevos durante toda su vida. El número de espermatozoarios que pueden contenerse en el receptáculo seminal pasa de veinte a veinticinco millones. Después de tres días del apareamiento el penis, ya seco, se desprende de la vagina.

Para terminar este breve estudio sobre la *apis mellífica,* que no contempla sino limitados aspectos de una cuestión agotada por muchos entomólogos y apicultores y que es de grandísimo interés para la Entomología y aún para la Biología general, queremos dedicar algunas palabras más respecto de las consideraciones que pueden hacerse sobre la colmena, en su conjunto.

Hay dos maneras de considerar el enjambre o colmena o ciudad sociable del mundo de las abejas. Según un modo de ver, la colmena es una conglomeración de muchos individuos particulares que viven en sociedad para un fin determinado. Todas las teorías sobre el "Estado modelo de las abejas" provienen de este punto de vista, que las asemeja al conjunto social humano y que, por este aspecto, las ha hecho tan interesantes desde tiempos remotos, para naturalistas y filósofos. La segunda manera de abocar la cuestión consiste en considerar el conjunto de las abejas que integran un panal o colmena, como un organismo completo. Así los apicultores modernos ven el total de una colmena como un todo orgánico. Para estos apicultores las obreras, la reina y los zánganos (figura 6) son meras articulaciones de este extraño organismo: la reina es su órgano sexual femenino, las abejas trabajadoras son sus miembros actuantes y los zánganos el órgano sexual masculino. La estructura del organismo "colmena", por decirlo así, queda constituído por el panal.

La consideración orgánica del conjunto de las abejas, que significa un organismo colmenar que nace, se desarrolla y muere tratando de conservarse la vida como conjunto, aún a expensas de la vida de los individuos que lo constituyen, es, ciertamente, una simple hipótesis, como lo es la que procura representarnos la colmena como una verdadera sociedad de individuos unidos por un interés común, pero para el apicultor tiene la ventaja de explicarle muchos de los fenómenos que ocurren en la colmena. Por eso este punto de vista se tiene hoy como moderno y práctico en las cuestiones que tratan de la Apicultura.

BIBLIOGRAPHICAL NOTES ON THE EUPHORBIACEAE

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While at work to settle the issue of priority between Boissier's "Centuria Euphorbiarum", and Klotzsch & Garcke's "Tricoccæ", both dated 1860, I found it necessary to investigate the most important contributions dealing with the Euphorbiaceæ between 1858 and 1867. Under a conservative estimate, this literature covers over three thousand published pages in constant use among taxonomists.

It is far from my purpose to present here a full bibliography of my subject. My immediate aim is essentially that of rectifying errors current in standard references, checking their further circulation. It is advisable, none the less, to bring within the pages of one short paper data denied to all botanists with the exception of the favored few who can consult rich libraries.

More genera and species of the Euphorbiaceæ were published between 1858 and 1867 than in any other nine years and, possibly, in all the history of taxonomy. Nor is this all. In this short span of time were laid the foundations of the classification which is being currently used at this hour. Pax & Hoffmann are the successors of Mueller Argoviensis in the full meaning of the term, so that the study of this family is still permeated by methods and concepts dating from 1866. Stating the fact, it is not my intention to imply that these methods and concepts are all hopelessly behind the times, for whatever is true is ageless. A tabulation of some of the data already assured, however, is clearly useful.

The necessity of monographing the Euphorbiaceæ for De Candolle's "Prodromus" brougt about much of the work done between 1858 and 1867. A frenchman, Henri Baillon (1827-1895) busied himself with this family first. The publication of his "Étude" at the end of 1858 called forth the work of a german, Johann Friedrich Klotzsch 1805-1860), who was assisted by another german, Friedrich August Garcke (1819-1904). The actual work for the "Prodromus", however, was entrusted by Alphonse De Candolle to two of his swiss collaborators, Edmond Boissier (1810-1885) and Jean Mueller (Müller) (1828-1896), known as Argoviensis from his birth-place in the Canton of Aargau. The indirect results of this work were also momentous for Botany as a whole. The publication of Baillon's "Étude" and Payer's "Organogénie" brought to a head the smoldering controversy as to the proper method for the investigation of all manner of plant- structures, flowers and fruits in particular. This controversy was ultimately settled in favor of skeletal anatomy by Van Tieghem, this brand of anatomy and morphology having been practically synonymous for the last three-quarters of a century. Mueller's handling of nomenclature in the "Prodromus" raised a storm of protest which prompted Alphonse De Candolle to write the Rules of Nomenclature of 1867. The modern Rules, as it is wellknown, are modelled to a very large extent upon these dicta of De Candolle.

In the following enumeration, woorks published in periodicals are discussed last. The sequence is chronological in the main.

(1) BAILLON'S "ETUDE"

The full title of this works is: "Étude générale du groupe des Euphorbiacées." It consists of a main text of 684 pages with an atlas of 27 plates and many figures, elucidated by 52 additional pages. Both the main work and the atlas are dated 1858 on the title-page.

An abstract of the "Étude" is printed in the proceedings of the sitting of july 26th, 1858, of the parisian Academy of Sciences (Acad. Sc. [Paris], Com.-Rds., 47: 147. 1858). Baillon wrote this abstract, in which the intention is acknowledged to issue two publications, one to deal with the generalities of the morphology, classification and typification of the Euphorbiaceæ, the other to describe the genera and species in detail. Only the first of these works (the "Étude") was published; the material accumulated for the latter would seem to be distributed, at least in part, through many of the pages of Baillon's periodical "Adansonia".

The actual date of publication of the "Étude" is variously given. This work is reviewed in the "Revue Bibliographique" of the sitting of december 17th, 1858, of the Botanical Society of France (Bull. Soc. Bot. France 5: 776. 1858), and spoken of as a very recent publication by Guillard in the sitting of the same Society held on january 7th, 1858 (op. cit. 6: 24. 1859). Klotzsch refers to the "Étude" (Akad. Wiss. Berlin, Monatsb. 1859: 240. 1859; op. cit., Abhandl., 1859)." Publication of the "Étude" late in december, 1858, is suggested by these data as well as by the fact that a copy of it was given by Payer to the Academy of Paris only on june 27th, 1859 (Acad. Sc. [Paris], Com. Rends., 48: 1143, 1164. 1859). However, an official record of publication on *September 25th, 1858,* is reported by the authoritative "Bibliographie de la France" (Jour. Gén. Impr. Libr., sér. 2, 2(1): 513.

1858*). This suggests that fully paged proofs of the "Étude" or advanced copies were ready at the end of september, but that the work itself was not available to the general public possibly before late *November, 1858.*

(II) KLOTZSCH & GARCKE'S "TRICOCCAE"

Klotzsch is the sole author of this contribution, but practically all the names it contains are jointly credited to the authorship of Klotzsch & Garcke. The full title reads: "Linné's natürliche Pflanzenklasse *Tricoccæ* des Berliner Herbarium's in Allgemeinen und die natürliche Ordnung Euphorbiaceæ insbesondere".

Dating this contribution with finality is difficult. It appeared at least twice with a different text; one issue was circulated as a periodical, in book-form and, most likely, as a reprint. The final and ampliated version saw the light as a preprint or as a reprint and in book-form. Although the dates here secured are close and amply sufficient for ordinary taxonomic work, it is not excluded that additional information may still be secured by cross references from german periodicals or minor works now not available.

The official publications took place as follows:

(a) In the sitting of march 10th, 1859, reported in the monthly proceedings or bulletins (*Monatsberichte*) of the Royal Prussian Academy of Science in Berlin (Akad. Wiss. Berlin, Monatsb., 1859: 236), the text running from p. 236 to p. 254. As a complete volume, such as they are available in most libraries, the "Monatsberichte" of 1859 were not issued before 1860, for p. 789 contains an obituary of W. Grimm dead on december 16th, 1859. They were also issued seperately, however, because the "Monatsberichte" of february and march, 1859, were available to the library of the Academy of Science in Paris in june of the same year (Acad. Sc. [Paris], Com.-Rds., 49: 99. 1859). Eleven "Hefte" of the same periodical, including the march number, were received at the Royal Academy of Sciences, Letters and Fine Arts of Brussels at a much later date, between february 2nd and february 4th, 1860 (Acad. Sc. Lett. B. Arts Belgique Bull., sér. 2, 9: 259: 1860), which shows that these "Monatsberichte" were being distributed irregularly. It is well established, at any rate, that Klotzsch's preliminary account was actually out of press *in late May or June, 1859.* Hasskarl reviewed this paper in a contribution dated december 1st., 1859, and written at the "Haus Buitenzorg bei Königswinter", published (Flora 43: 8) on january 7th, 1860. The "Haus Buitenzorg" was an estate in the Netherlands or Germany, not the botanical garden of that name, as it is well known (see Backer, Verkl. Woordenb. 256, 1939). Hasskarl definitely left Java in 1859. Hasskarl probably had in his hands a reprint with full pagination.

Difficulties of citation are bound to arise in connection with some of the names published in the "Monatsberichte", which cannot be elucidated here. It is fortunate that the entries of the "Index Kewensis" based on the "Monatsberichte" under present review are fairly accurate; they may be freely followed except in the most exacting monographic work.

(b) In the memoirs of the same Academy (op. cit., Abhandl., 1859: 1. 1860); the text runs continuously from p. 1 to p. 108 and follows rather closely that of the "Monatsberichte" for the first nineteen pages. The main discrepancy is owing to the addition of a discussion in which Klotzsch refutes Baillon's understanding of the inflorescence of the Euphorbieæ. This addition is introduced, pp. 5-7 of the "Abhandlungen", and considerably lengthens the original account, p. 241 of the "Monatsberichte". Other discrepancies also occur in the disposition of certain names, witness the fact, for instance, that *Euphorbia sphærorrhiza* Benth. is put under *Adenopetalum* Kl. & Garcke in the "Monatsberichte", p. 250, while it is transferred to *Tithymalopsis* Kl. & Garcke in the "Abhandlungen", p. 15. From p. 20 to p. 108, the "Abhandlungen" contain original material, including the publication of the *nomina nuda* rife in the "Monatsberichte".

Barrring data to the contrary, which, I have not found, the "Abhandlungen" were published as a volume only in the latter part of 1860. Their p. 626 is dated august 1st, 1860, and they were received in Paris in december, 1860 (Acad. Sc. [Paris] Com.-Rds., 51: 1104. 1860). This time, the Academy of Brussels had them earlier, at the beginning of november of the same year (Acad. Sc. Lettr. B.-Arts Belgique, Bull., sér, 2, 10: 591. 1860). A full page reprint or preprint of Klotzsch's work-probably the same as the one I have in my possession, bound in green cardboard and fully titled thereon — must have been circulated at a much earlier date. In an article dated juli 12th, 1860, and printed on sept. 7th of the same year (Flora 43: 520), Hasskarl once again reviews Klotzsch's conclusions, giving an elaborate key to the Klotzschian genera and carefully comparing the diagnoses of the "Monatsberichte" with those of the "Abhandlungen". Hasskarl's review is not a hasty compilation, so that it is not likely that he had a reprint available much later than june, 1860, and possibly earlier. Some evidence can be drawn from Boissier's "Centuria" that this reprint was out of press in late march or april, 1860. It is strange that Klotzsch's work should not have attracted widespread attention and that it should not have been reviewed, for instance, in France. Everything considered, the final elaboration of Klotzsch's "Tricoccæ" would seem to have been out of the press as separate from the "Abhandlungen" *between late March and June, 1860.*

(*) This bulletin periodically listing books published in France is usually referred to as "Bibliographie de la France". This is only a sub-title, however, the full title being: "Journal Général de l'Imprimerie et de la Librairie. Premiére partie. Bibliographie"; the heading "Bibliographie de la France" is displayed on the first page of each number, which accounts for its widespread circulation among bibliographers.

(III) BOISSIER'S "CENTURIA"

Wishing to protect the priority of about a hundred of his manuscript names, Boissier had this pamphlet of 40 pages printed as an independent work. The full title is "Centuria Euphorbiarum", and the title-page bears the printed date "Aprili 1860". Despite its being an important source of live nomenclature, the "Centuria" attracted surprisingly little attention. Pritzel's standard "Thesaurus" overlooks it in both editions; Briquet lists it as a matter of course in his classic biographies and bibliographies of swiss botanists (Bull. Soc. Bot. Suisse 50a: 57. 1940*), but gives only the date of the year of publication, omitting the month.

When writing, or at least when correcting, the "Centuria", Boissier knew the works of Klotzsch and Garcke, proof of which is the fact that he reduced several of their binomials to synonymy. It is unfortunate that in so doing Boissier failed to refer to a specific work and page. Both *Anisophlyllum leiospermum* and *Tithymalus multicaulis* are first announced by Klotzsch & Garcke in the "Abhandlungen" (op. cit. 23, 98); Boissier cites the former under *Euphorbia phyllanthoides* Boiss. (op. cit. 5) as follows: "E. leiosperma Kl. et Gke. sub Anis. non Sibth.", the latter under *E. sclerophylla* Boiss.(op. cit. 37), stating: "Tith. multicaulis Kl. et Gke. non alior.". Of these two citations, the former leaves it open to question whether Boissier actually refers to a printed text, but the latter patently alludes to a mere manuscript name *in sched.* If this discrepancy in citation is not the result of a straight oversight —which in the case of a work by Boissier cannot be lightly assumed— it is indicated that Boissier had available a reprint of the "Abhandlungen" before april, 1860, but declined to cite it in full for an undisclosed reason, doubting perhaps that the pagination of this reprint would prove to be realiable. If no better evidence can be found, the Boissierian binomials in the "Centuria", dated *April, 1860,* take precedence (see Intern. Rules Bot. Nomencl., 1930-1935, Art. 45) over those of Klotzsch & Garcke in the "Abhandlungen". This means that such names of Klotzsch & Garcke as *A. leiospermum* and *T. multicaulis* were first published as synonyms by Boissier.

(IV) BOISSIER'S "EUPHORBIEAE IN THE PRODROMUS"

Boissier prepared the monograph of the Euphorbieæ for the "Prodromus Systematis Universalis Regni Vegetabili", edited and partly written by Alphonse De Candolle. This monograph consists of a text of 185 pages (DC. Prodr. 15 (2): 30188. 1862) and 9 pages of supplement (op. cit. 1261-1269. 1866).

(*) This is a posthumous edition; Briquet died in 1931.

The supplement will be dated in the next review. The monograph itself came to light in *January, 1862* (see Stearn in Candollea 8: 3. 1939; Bull. Soc. Bot. France 9: 55. 1862). A copy of this monograph presented by an unnamed donor was recorded as an accession to the library of the French Academy of Science on february 10th, 1862 (Acad. Sc. (Paris), Com.-Rds., 54: 287. 1862). This indicates that the actual publication probably took place in late january, as stated by Stearn.

(V) MUELLER'S "EUPHORBIACEAE IN THE PRODROMUS"

The Euphorbiaceæ of the "Prodromus" with the exception of the Euphorbieæ (see above IV) were monographed by Mueller (DC. Prodr. 15 (2): 189-1260, 1269-1286. 1866). Mueller is also the author of the diagnosis of the family (op. cit. 1-3) which opens the monograph of the Euphorbieæ published, as stated, in january, 1862. This work cost Mueller seven years of toil interrupted by trips to various european herbaria, of which Briquet (Bull. Soc. Bot. Suisse 50a: 341. 1940) tells us: "Le travail inmense que Müller accomplit en rédigeant les Euphorbiacées pour le *Prodromus,* et qui exigea sept ans d'efforts soutenus, affaiblit à un tel point sa santé, qu'il dut prendre un long repos." This will not come as a surprise to those who know the range and the difficulty of this family. Considering that Mueller failed, as it seems, to understand the mainsprings of the systematy of the Euphorbiaceæ, his burden proved to be almost beyond the limits of human endurance, for each group presented him with fresh and exacting problems, all more or less alike but all different in subtle, unending degrees.

Stearn dates the work of Mueller (Candollea 8: 3. 1939) as of late august, 1866. This date is borne out by Mueller himself (Bot. Zeit. 24. 333. 1866) who states: "Nachdem gegen Ende des August meine Arbeit über die Euphorbiaceen in *De Candolle's* Prodromus erschienen..." In a footnote to a paper dealing with Australian Euphorbiaceæ (Adansonia 6: 318. 1866), Baillon remarks: "La publication des Euphorbiacées du Prodromus répondant à ce point de l'impression de notre manuscrit, nous modifierons désormais ce dernier, de manière à établir une synonymie exacte entre les deux ouvrages". Page 289 of the cited volume of "Adansonia" is dated august, 30th, 1866; page 321, september 1866; which indicated that Baillon had a copy of Mueller's monograph available by the beginning of september. A copy of the same work was given by Decaisne to the Academy in Paris on september. 10th (Acad. Sc. [Paris], Com.-Rds., 63: 448, 464. 1866). Since the firm of Victor Masson & Fils, business editors and main selling agency of the "Prodromus", had their seat in Paris, and Baillon and Decaisne were certainly among the first to secure a copy of it, it seems li-

kely that Mueller's monograph was offered for public sale *on or around September 1st, 1866.*

(VI) BOISSIER'S "ICONES"

This work is titled in full: "Icones Euphorbiarum ou figures ce cent vingt-deux Especès du Genre Euphorbia dessinées et gravées par Heyland avec des considérations sur la classification et la distribution géographique des plantes de ce genre, par E. Boissier.", and consists of 120 plates with 24 pages of text (pp. 1-24). The title, as it is readily seen, would justify a joint authorship of Boissier & Heyland.

Pritzel sets the date of publication of the "Icones" in 1856, which is a misprint, but a misleading one, nevertheless. It is true that Boissier refers to the plates of the "Icones" in 1862, but Briquet explains (op. cit. 57, footn. 1) that these plates were then in loose form and that the book of the "Icones" was out of press in 1866. From a statement in the Icones", p. 3, in which Boissier affirms that the illustrations were partly drawn from: "Un petit Supplément qui será publié à la fine du quinzième volume du Prodromus", Briquet infers that the "Icones" were published in the beginning of 1866. A reviewer, on the contrary, speaks of this work (Bull. Soc. Bot. France 13: 185. R.B. 1866) in a manner which implies that it might have come out after the "Prodromus". Publication late, possibly very late in 1866 is also indicated by the fact that the "Icones" are recorded among the "Botanische Neuigkeiten in Buchhandel" (Flora 50: 237) on may 28th, 1867. The total evidence thus favors the belief that this work was actually out of press *in the second half of 1866.*

(VII) MUELLER'S "EUPHORBIACEAE IN MARTIUS'S FLORA BRASILIENSIS"

Briquet errs (op. cit. 346) in giving 1873 as the year of publication of this work. It is definitely dated inside the title-pages (Mart. Fl. Bras. 11 (2): 1-750 Pls. 1-104) as follows: pp. 1-292, Pls. 1-42 —*February 1st, 1873;* pp. 293-750, Pls. 43-104— *May 1st, 1874.*

Mueller contributed this work, which includes numerous novelties, while busily engaged in his favorite lichenological studies. Traces of careless handling —unusual in Mueller's work— are revealed here and there. It is apparent, for instances, that Mueller failed to restudy his own type-material, duplicating under new names species already published in the "Prodromus". In one case at least, he probably used the same collection twice; *Tweedie* specimens from the Paraná would seem to be the type of *Manihot Tweediana* Muell.-Arg. (Mart. Fl. Bras. 11 (2): 450. 1874) as well as that of *M. palmata* delta *multifida* Muell.-Arg. (DC. Prodr. 15 (2): 1062. 1866), these two entities being absolute synonyms.

Although this contribution does not fall within the period 1858-1867 which is the subject of the present study, it proves impossible to omit it here. It implements and supplements everything which Mueller wrote on the Euphorbiaceae, and the doubts and mistakes it brings into the records of this family make it impossible to monograph it within the american range so long as many type-specimens are unavailable.

Periodical Literature

(1) MUELLER'S CONTRIBUTIONS

The task of monographing the Euphorbiaceae for the "Prodromus" was entrusted by Alphonse De Candolle to Mueller in 1858 or 1859 when Baillon had barely finished the "Étude". The next seven years witnessed a race between Baillon and Mueller —who not always were on friendly terms— each striving to secure for himself the priority of the novelties available. So close was this race that priority is often determined by less than a month's time in favor of one or the other author.

Bentham comments (Jour. Linn. Soc., Bot., 17: 189. 1878) on Mueller's approach to nomenclature in a manner tending to discredit or at least to impair the latter's reliability as a bibliographic source. Says Bentham: "The extraordinary manner in which J. Mueller, in the 'Prodromus', had appropriated to himself long-established names of genera or species if he only made the slightest change in their character or circumscription, the publishing as his own so many names that he found in widely distributed collections of specimens or in generally published catalogues, excited much comment on the part of botanists." The casual reader of this statement may infer that to accept Mueller's testimony in matters involving nomenclatural priority is not consistent with the canons of critical bibliographic work. Such an inference would be misplaced in my considered opinion, and much of the "comment" heard against Mueller in Bentham's times was based upon a misunderstanding of Mueller's methods. These methods, as a matter of fact, favorably compare with many now current, for Mueller had a keen understanding of trinomials, such as is not apparent in much modern work.

Mueller erred in believing that his was the right of discarding the names of an earlier author if he altered the circumscription of these names. This error is in evidence whenever he rejects, for instance, the sectional names of Baillon to create new ones with an enlarged meaning. To this extent, obviously, Bentham's criticism holds. However, in practically every other case, Mueller was exceedingly careful of priority, accepting synonymies involving his own binomials if it could be proved that they had been published even a few days after those of Baillon. Once this is well-established, and it is known that Mueller's data have not been challenged by Baillon himself, no reason exists to reject Mueller's authority as a bibliographical source.

The papers of Mueller of immediate interest for the "Prodromus" are the following:

(a) "Euphorbiaceæ. Vorläufige Mittheilungen aus dem für De Candolle's Prodromus bestimmten Manuscript über diese Familie."

This contribution consists of 126 pages (Linnæa 32: 1-126. 1863), covering practically all the first *Heft* of the periodical cited. Evidence of general nature discussed below (see under [d]) sets the date of actual publication between *January and March, 1863.*

(b) "Neue Euphorbiaceen des Herbarium Hooker in Kew, auszugweise vorläufig mitgetheilt aus dem Manuscript für De Candolle's Prodromus."

Five issues (Flora 47: 433-540. 1864) are devoted to the publication of this work dated as follows: september 3rd, pp. 433-441; september 22nd, pp. 465-471; october 5th, pp. 481-487; october 25th, pp. 513-520; november 9th, pp. 529-540.

(c) "Systemen der Euphorbiaceen".

Mueller's tribal names mainly date from the publication of this work. It consists of but one page, dated october 2nd, in manuscript and published within a few days (Bot. Zeit. 22: 324. *October 14th, 1864*).

(d) "Euphorbiaceæ. Vorläufige Mittheilung aus dem für De Candolle's Prodromus bestimmten Manuscript über diese Familie."

This is a continuation of (a), discussed above, and is unfortunately omitted in Briquet's authoritative bibliography (op. cit. 345). It consists of 224 pages (Linnæa 34: 1-224) covering the best part of two *Hefte* of the periodical cited, which is dated "1865-1866' on the title-page. Considering that it is exceedingly difficult to determine the correct dates of publication of the *Hefte* of "Linnæa"* it proves lucky that Mueller himself dates this work with fair accuracy. Page 23 is recorded as of march, 1865 (under *Acalypha communis,* DC. Prodr. 15 (2): 840. 1866), page 126 virtually ending the first *Heft* is said to have been published the same month (under *Croton glechomæfolius,* op. cit. 643), page 224 at the end of *Heft* 2 is dated july, 1865 (under *Dalechampia microphylla,* op. cit. 1237). Since *Dalechampia microphylla* is said to have been published "paucis ut videtur diebus, nomine a cl. Baill. edito posterius", and is accepted by Mueller as a synonym of *D. glechomæfolia* Baill., published "ineunte Jul. 1865", it follows that the whole work was published in two issues, the first (approximately pp. 1-128) in *March, 1865,* the second (approximately pp. 129-224) *in the second third of July of the same year.*

(e) "Ueber Glochidion (Forst.)"

A short but important work of seventeen pages, published in two issues, august 19th, 1865 (Flora 48: 369-380), and august 26th of the same year (op. cit. 385-391). In this contribution, Mueller transfers to *Phyllanthus* species previously published under *Glochidion.* This creates much intricate synonymy of which this paper is the source.

(f) "Nachschrift zu meiner systematischen Arbeit über die Euphorbiaceen".

The manuscript is dated september 29th, 1866, and was prepared to elucidate the systematic concepts of the "Prodromus", which had just been published. It consists of 13 pages (Bot. Zeit. 24: 333-345) vital to an appreciation of Mueller as a systematist, and was published in two issues, pp. 333-340, october 26th, 1866; pp. 341-345, november 2nd, 1866.

Briquet credits to Mueller (Bull. Soc. Bot. Genève 50a: 345. 1940) three works: "Sur l'inflorescence du genre *Dalechampia",* "Sur les genres *Macaranga* et *Pachystemon"* and "Les caractères sécondaires de l'estivation du calice", referred to the "Mémoires de la Société de Physique et d'Histoire Naturelle de Genève", 18: 428-430. 1866. The last of these works in particular is suggested to be important, because it is well known that Mueller read in the vernation of the male calys "so absolute a tribal value as to make the most unnatural combinations" (Bentham, Jour. Linn. Soc. Bot., 17: 188. 1878). These three works actually consist of a sketchy report on oral communications by Mueller to the genevan Society. This is written by Gosse in the "Rapport sur les travaux de la Société de Physique et Histoire Naturelle de Genève depuis juillet, 1865, à juni, 1866", which accounts for the fact that no bibliographer other than Briquet in the periodical cited credits these titles to Mueller.

(II) BAILLON'S CONTRIBUTIONS

The contributions of Baillon dealing with the Euphorbiaceæ between 1859 and 1867 are contained in the pages of "Adansonia-Recueuil periodique d'observations botaniques", of which Baillon was editor and chief contributor. This periodical was issued in separate releases (*livraisons*), forming a volume of about 380-385 pages with plates. In the period under present consideration, each volume of "Adansonia" runs from september to august (inclusive) of the next year, beginning with september 1860.

The subtitle "Recueuil périodique d'observations botaniques" under which this periodical frequently cited aptly describes its manner of publication. Since every volume consists of 24 *cahiers,* it is commonly believed that each monthly issue consisted

(*) The bound volumes of "Linnaea" are dated with reference to one or two years on the title-page, apparently owing to the fact that the editors depended upon the supply of manuscript to go to press. Volume 30, for instance, is dated "1859-1860", the first **Heft** running to p. 128, the second to p. 256. The first two papers published are by Peyritsch, pp. 1-82, dated in mss. February 21st, 1859, and by Willkomm, pp. 83-142, dated in mss. april, 1859. To judge from the amount of pagination verified by Svenson (Rhodora 41: 413. 1939) on the evidence of the original wrappers of Vol. 35 (1868) and Vol. 36 (1869-1870), it seems probable that the cited works of Peyritsch and Willkomm came to light together in may or june, 1859. This automatically accounts for the fact that Vol. 30 ran from 1859 to 1860. Unlike "Flora" and the "Botanische Zeitung", strictly periodical in nature, "Linnaea" was more or less irregularly issued.

of 2 *cahiers*. This is an error. It is known, for instance (see Bull. Soc. Bot. France 11: 131. 1864), that the first 57 pages of Vol. 4, dated officially september, 1863-august, 1864, were out of press in a *livraison* dated december, 1863-february, 1864. Part of Vol. 6 (September, 1865-August, 1866) is dated at the beginning of each *cahier*, the dates being in part as follows: p. 177 (*Cahier 12*), October 7th, 1865; p. 193 (*Cahier 13*), March 11th, 1866; p. 209 (*Cahier 14*), March 11th, 1866; p. 225 (*Cahier 15*), May 18th, 1866; p. 241 (*Cahier 16*), June 12th, 1866. The last *cahier* (N° 24, pp. 369 et seq.) is dated october, 1866. This is the date of actual publication, and it belies the indications of the title-page, according to which Vol. 6 should have ended in august of the same year. It is patent that "Adansonia" came out of the press at irregular or very irregular intervals even in its earlier years and that the rhythm of its publication depended on the supply of manuscript.

To date Baillon's works with accuracy it would be necessary to find some bound set of "Adansonia" still inclosing the original wrappers of each *livraison*. Unfortunately, all the copies I have seen are shorn of these adjuncts, which forces me to rely upon cross-references, leaving gaps in the record which I hope to fill as occasions present themselves to learn the facts.

For the first volume of "Adansonia", running from september, 1860, to august, 1861, the Bulletin de la Société Botanique de France" in its vol. 1861, supplies the following dates:

p. 45 – "Adansonia" 1: 44- 49 – October, 1860
46 – 55- 57 – October, 1860
101 – 90- 96 – November, 1860
101 – 97-103 – December, 1860
101 – 124-128 – December, 1860
101 – 129-138 – January, 1861
187 – 189-192 – February, 1861
187 – 193-211 – March, 1861
315 – 214-231 – March-April, 1861

The "Bibliographie de la France", Vol. 5 (1), Sér. 2: 426. 1861, supplies the date august, 1861, for pp. 353-380 of the cited volume of "Adansonia", which all makes it possible to date the following contributions of Baillon in the same volume:

1 – "Monographie des Phyllanthus" pp. 23-43. September, 1860.

2 – "Genera Euphorbiacea tria nova" pp. 50-54. October, 1860.

3 – "Species Euphorbiacearum. A. Euphorbiacées Africaines" pp. 58-87. October-November, 1860.

4 – "Énumération des Euphorbiacées cultivées dans les Jardins Botaniques de Paris" pp. 104-117. December, 1860.

5 – "Species Euphorbiacearum. A. Euphorbiacées Africaines" pp. 139-173. January-February, 1861.

6 – "Species Euphorbiacearum. A. Euphorbiacées Africaines" pp. 251-286. May to August (probably June-July), 1861.

7 – "Énumération des Euphorbiacées cultivées dans les Jardins Botaniques de Paris" pp. 340-352). May to August (probably July-August), 1861.

The "Énumération" is generally overlooked, but proves to be important, on the contrary, because three genera of Klotzsch & Garcke (*Arthrothamnus*, p. 106, *Trichosterigma* p. 114, *Sterigmanthe* p. 114) and, possibly, two of Rafinesque (*Petaloma*, p. 114; *Pleuradena*, p. 116) are in it reduced for the first time to sectional status. It is true that Baillon does not designate the rank while effecting the reductions, but this may be inferred with reference to *Tithymalus* being clearly designated as a section (op. cit. 62). In addition, sectional status is granted most of the generic subdivisions of the "Énumération" in an earlier work by Baillon (Étude Gén. Euphorb. 284. 1858). These publications by Baillon invalidate the later one by Boissier. Accordingly, the "Énumération" proves to be a source for the systematic treatment of the Euphorbieæ which no author should neglect.

The second volume of "Adansonia" September, 1861—August, 1862, is dated (Bull. Soc. Bot. France 9. 1862) as follows:

p. 248 – "Adansonia" 2: 211-242 – March-April, 1862
305 – 202-210 – March, 1862
488 – 253-257 – April, 1862
552 – 257-261 – May, 1862

The "Bibliographie de la France", Vol. 7 (1), Sér 2: 1. 1863, supplies an additional date, july-august, 1862, for. pp. 330-381, which yields this tabulation:

8 – "Monographie des Phyllanthus" pp. 13-20. Late 1861, possibly september to october.

9 – "Species Euphorbiacearum. A. Euphorbiacées Africaines" pp. 27-55. Late 1861, possibly october-november.

10 – "Remarques sur une nouvelle espèce du genre Menarda" pp. 60-64. Late 1861, as above.

11 – "Species Euphorbiacearum. Euphorbiaceæ Neo-Caledonicæ" pp. 211-242. march-april, 1862.

12 – "Remarques générales sur les Phyllanthées de la Nouvelle-Caledonie" pp. 242-248. march-april, 1862.

The third volume of "Adansonia", September, 1862 – August, 1863, is dated but once by the "Bibliographie de la France", Vol. 7 (1), Sér. 2: 117. 1863, which gives november, 1862, for its pp. 50-128. This cross-reference yields:

13 – "Species Euphorbiacearum. A. Euphorbiacées Africaines" pp. 133-166. Late 1862 or, more probably, early 1863.

14 – "Sur le *Mercurialis alternifolia* Desr. et sur les limites du genre Mercuriale" pp. 167-176. See above.

Only few dates of issue of the fourth volume, September, 1863. August, 1864, are known from the "Bulletin de la Société Botanique de France", 11. 1864, as follows:

p. 131 R. B. – "Adansonia" 4: 1- 57 – December, 1863. February, 1864.
252 R. B. "Adansonia" 132-140 – June, 1864.

These cross-references give, accordingly:

15 – "Species Euphorbiacearum. Euphorbiacées Américaines" pp. 257-377. July-August (possibly to october) 1864.

The fifth volume of "Adansonia", September, 1864. August, 1865, is broadly dated 1865 for pp. 147-148 (Bull. Soc. Bot. France 12: 159 R. B. 1865). Mueller Argoviensis supplies additional information (DC. Prodr. 15 (2): 839, 840, 887, 1237, 1250. 1866). This dates:

16 – "Sur les limites du genre *Cephalocroton*" pp. 147-148. Early 1865.

17 – "Species Euphorbiacearum. Euphorbiacées Américaines"; pp. 221-240. Late april or early may, 1865; pp. 305-360, early july (possibly to august-september), 1865.

The sixth volume of "Adansonia", September, 1865. August, 1866 (actually ended in late october, 1866, as previously stated), supplies many dates in the text, as follows:

18 – "Additions à l'énumération des espèces d'Euphorbiacées du Brésil" pp. 15-16 (undated but apparently late 1865).

19 – "Sur deux Euphorbiacées brésiliennes" pp. 231-238. May to June, 1866.

20 – "Species Euphorbiacearum. Euphorbiacées Australiennes" pp. 282-345. Late july to late september or early october, 1866.

21 – "Description du genre Longetia" pp. 352-359. October, 1866.

22 – "Étude sur les Actephila Australiens" pp. 360-363. October, 1866.

This enumeration of the lesser works of Baillon does not cover contributions lacking immediate taxonomic interest, witness, for instance, the studies: "Observations sur l'Euphorbia paucifolia Kl." (Adansonia 1: 291-297. 1861), and "Sur la parthénogénèse et la suppression du genre Cælebogyne" (op. cit. 6: 368-379. 1866). Reference to the data supplied above easily shows that the former was published between may and august, 1861, most likely in july, and the latter in october, 1866.