Linnaeus' and Magnolia's 250th Formal Anniversary

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I have no idea what Americans do on the first of May but in Europe it's Labour Day, on which day we, strangely enough, do not work. This year it is also the day that we celebrate the 250TH anniversary of Linnaeus' *Species Plantarum* and at first sight these two events don't have anything in common. That is, until you begin to realise what tremendous labour it must have been for Linnaeus to compile those two volumes: the preparation of the definite version of the manuscript alone took him over a year and that was after he finished assembling his notes and having written a first draft. It is well documented that Linnaeus was literally exhausted when he finally brought the manuscript to the printer. In this light, it was not at all a bad idea to call this date Labour Day.

This first edition of *Species Plantarum* has later become the starting point for botanical nomenclature. For us, it is of interest because Linnaeus included accounts on *Liriodendron, Magnolia,* and *Michelia* in the *Species* and anyone who's interested in the history of the naming of our favourite plants sooner or later will want to consult this work. This article is on the origin of the *Species Plantarum* and on the sources Linnaeus used for the names of Magnoliaceae *avant la lettre.*

Early history of the *Species Plantarum*

The preparation of the *Species* had begun as early as 1732 when Carl Linnaeus (1707-1778) was identifying plant specimens he had collected in Lapland and felt the need for a comprehensive work. From his own correspondence it appears there must have been a draft of parts of such a work in 1733, but soon after he was taken up with other pursuits. For one thing, to be admitted as a lecturer in Botany but also to convince his fiancée's father of his qualities, he had to get a doctor's degree which was impossible to get in Sweden at that time. So, he went to Holland in 1735 to get a doctor's degree quickly and cheaply in Harderwijk. At that time Holland was more renowned for its high quality printing than for its cheap diplomas and Linnaeus brought with him a number of manuscripts that he wanted to have printed. When he went to Leyden and met Gronovius (Johan Frederik; 1686-1762), the latter was immediately impressed by the quality of these works, especially the *Systema Naturae*. He and his friend, Lawson, urged Linnaeus to publish it at once and had it printed at their own expense. Linnaeus' star thereupon soon started to rise in the international scientific community. In September 1735, the wealthy Dutch East India Company director George Clifford (1685-1750) appointed him physician and curator of his garden, which assured him of financial stability during his stay. He moved to the estate of Hartekamp, where, at Clifford's mansion, he found plant specimens arriving both from the Orient and from the New World for Clifford's garden and herbarium, and, what's more, a library of botanical books that was near incredible for those days. Clifford also enabled Linnaeus to visit England, where he met several lead-

ing naturalists and stayed with the famous botanist Dillenius (1684-1747) for a month.

Linnaeus' sexual system of classification

While Linnaeus stayed at Hartekamp, he finished a number of manuscripts and had them printed. Among those was the first edition of his *Genera Plantarum* (1737). In this work he elaborated for the first time all genera recognized by him, arranged according to his sexual system, which had been newly introduced in the first edition of *Systema Naturae* (1735). For a better understanding, one should know that Linnaeus based his classification upon the sexual parts of the plants, the stamens and pistils, male (andria) and female (gynia) as he called them, the number and arrangement of stamens determining the primary level *(Classis)*, the number of pistils the secondary level *(Ordo)*. This system of classification is highly artificial, of which Linnaeus was very well aware. It was, however, the first ever classification in which all known species could be fitted and it could be used as a key, too. Linnaeus himself saw his classification as a provisional one, simple and practical, but to be abandoned as soon as a more natural comprehensive one was found. It was used until about 1830. By that time it had gradually become replaced by a system based on A.L. de Jussieu's *Genera Plantarum* (1789).

Linnaeus also elaborated the characters of the genus *Magnolia* in the *Genera*. No one who has ever counted stamens and pistils in *Magnolia* will be surprised that this genus was placed in Polyandria Polygynia (numerous stamens and numerous pistils, numerous being more than 20).

Clifford's library

Linnaeus' main task while in Clifford's service was the preparation of the *Hortus Cliffortianus*, a catalogue of the plants in Clifford's herbarium and vast garden. This book is to be considered a precursor for his *Species Plantarum*. In it, an account (comprising 17 pages plus a one-page index) of the 295 books in Clifford's botanical library is given, systematically arranged, of course; after all it was Linnaeus who wrote it. Many of the works he later often referred to, he got to see for the first time in Clifford's library. Though he stayed at Hartekamp for only two years, this period had a major influence on his later work, including the accounts on *Magnolia* and *Michelia* in the *Species Plantarum*.

Completion of the *Species Plantarum*

In 1738 Linnaeus returned to Sweden, where he was soon married and appointed professor at Uppsala. It was not until 1746 that he took up work on the *Species Plantarum* again, but, as he had other duties, the work didn't proceed very prosperously. By the end of 1748 he had reached the Tetradynamia (that is, he was far past half way) but then had to put the work aside because of illness (gout). It was in June 1751, the month Kalm returned from North America bringing numerous exciting specimens with him, that Linnaeus made a new start. He decided that he would take up only synonyms and citations of major importance and used the abandoned draft of 1746-1748 as the basis for the work, referring often to his *Hortus Cliffortianus* for additional synonymy. By the beginning of June 1752 Linnaeus finally reported that the work was done, but then Osbeck returned from China with new material and he once more revised the entire work to include Osbeck's

We clearly recognize *Magnolia virginiana* in this plate (t.39) of Mark Catesby. It was published with the name *Magnolia lauri folio subtus albicante* in 1730, at least 23 years before Linnaeus placed this species in the genus *Magnolia*.

plants. By July 1752 the two volumes were eventually delivered to the printer in Stockholm.

Significance of the work

What made the *Species Plantarum* a real landmark was not the number of taxa described in it, although one significant feature was of course that the work was comprehensive in the sense that all plants known by then were included. The single most important advantage however, was the method Linnaeus used to refer to the species. Until then it had been common practice to use a Latin descriptive sentence (phrase-name) to indicate a species. These sentences were often as long as ten words and thus time and space consuming (in Catesby's *Natural History of Carolina* for example we find *Arbor Tulipifera Virginiana tripartito aceris folio, media lacinia velut abscissa* for the Tuliptree). Moreover, these names had to be changed when new species were discovered and the old diagnostic characters turned out not to suffice anymore. In Linnaeus' new system of reference, every species was indicated by only two words—a binomial—the first word representing the genus to which a species was assigned, the second word (the epithet) representing the species within that genus. What's most important is that the name was disconnected from the characters of the species and could thus act as a point of reference because it was essentially constant. These short names—Linnaeus called them *nomina trivialia* [trivial names], to set them apart from the "real" phrase-names—were an immediate hit. It has been helpful, to some extent, that many of Linnaeus' works had been published in Holland, the quality of its printing ensuring them of a wide circulation, so he had already gained some reputation before the *Species* was issued.[1] Linnaeus'

new system of naming was soon followed by other authors and within ten years became the *de facto* standard; within another fifteen years it had completely superseded the earlier names. It was not until 1867, however, when Alphonse de Candolle formulated his *Lois de la nomenclature botanique* [laws of botanical nomenclature], that Linnaeus' works were proposed as the starting point of modern nomenclature. Finally, the International Botanical Congress of Vienna (Wien) in 1905 accepted the *Species Plantarum* of 1753 as the one work to act as such.

In this plate (t.15), published in 1747, Mark Catesby painted a magnolia, based upon a specimen of *Magnolia acuminata* without a flower, sent to him by John Clayton. Catesby probably based the white flower upon a description that Clayton added to the specimen.

The *Species Plantarum* serving as the starting point of botanical nomenclature doesn't mean that all the information in it was new (it's not the starting point of botany). The two volumes comprised a total number of over 5900 species. Certainly quite a number of these were first described by Linnaeus as he had his students travel all over the world to gather new species for him (as mentioned before, the printing was delayed by some months because Linnaeus incorporated new species brought to him by Osbeck on return from his voyage to China). The vast majority of the species however had been published in earlier botanical works by other authors, but not as binomials. As we will see next, this was also the case for *Magnolia, Liriodendron,* and *Michelia*.

The first *Magnolia*

Many plants that we call *Magnolia* now had been described early in history by the Chinese (11TH century), Aztec, and Spanish (16TH century), who referred to them by their local names. A very good account on early references is given by Treseder on pages 9-11 of his *Magnolias* (1978). The first plant to receive the name

536 POLYANDRIA POLYGYNIA.

Laurus tulipifera, baccis calyculatis. *Raj. hist.* 1690.

fœtida. β. Magnolia foliis ovato-oblongis ſubtus viridibus. *Anon.*
Magnolia altiſſima, flore ingenti candido. *Catesb.car.* 2. *p.* 61. *t.* 61. *Ehret. pict.*
Magnolia ampliſſimo folio, fructu cæruleo. *Plum.gen.* 38.
Magnolia flore maximo albo fœtido, foliis deciduis amplis, florum ad ramulorum ſeriem ſphærice cingentibus, fructu majori. *Gron. virg.* 61.

griſea. γ. Magnolia foliis ovato-oblongis ſubtus griſeis. *Anon.*
Laurus tulipifera, foliis ſubtus ex cinereo aut argenteo purpuraſcentibus. *Raj. hist.* 1718.

tripetala. δ. Magnolia ampliſſimo flore albo, fructu coccineo. *Catesb. car.* 2. *p.* 80. *t.* 80.

acuminata. ε. Magnolia flore albo, folio majore acumniato haud albicante. *Catesb. car.* 2. *p.* 15. *t.* 15. *Gron. virg.* 61.
Habitat in Virginia, Carolina. ♄
Utrum hæ: α. β. γ. δ. ε. ſint diſtinctæ, determinent autoptæ in ſolo naturali? harum.
δ. Petalis tribus exterioribus reflexis.
ε. Foliis ovatis acuminatis.
β. Flore maximo & longiore in diametro quam foliorum longitudo & Foliis ſubtus griſeis.

MICHELIA.

Champaca. 1. MICHELIA. *Fl. zeyl.* 144.
Champacam. *Rheed. mal.* 1. *p.* 31. *t.* 19. *Raj. hist.* 1641.
Habitat in India. ♄

On these two pages are illustrated the lower two thirds of page 535 and the upper two thirds of page 536 of the *Species Plantarum*, where the Magnoliaceae can be found. Lars Salvius, the only printer in Sweden that could handle the job, used worn type, which explains the raggedness of the characters. Note the similarity of the character "s" when it's not trailing, and "f."

Magnolia[2] was a species from Martinique, described and pictured by the Frenchman Charles Plumier (1646-1704) in his *Nova Plantarum Americanarum Genera* (1703) as *Magnolia amplissimo flore albo, fructu caeruleo*. The species was known as *Magnolia plumieri* from 1788, then as *Talauma plumieri* from 1817, as *Talauma dodecapetala* from 1918 and only recently (1996) became known again as a *Magnolia (Magnolia dodecapetala)*; the full synonymy runs as follows:

Magnolia dodecapetala (Lamarck) Govaerts in: Frodin & Govaerts, World Checkl. Bibliogr. Magnoliaceae (1996): 70; basionym: *Annona dodecapetala* Lamarck, Encycl. 2 (1786): 127 (as *'Anona'*); *Talauma dodecapetala* (Lamarck) Urban, Repert. Spec. Nov. Regni Veg. 15 (1918): 306.

Magnolia plumieri Swartz, Prodr. Veg. Ind. Occ. (1788): 87 (as *'Plumiera'*); *Talauma plumieri* (Swartz) A.P. de Candolle, Syst. Nat. 1 (1817): 460;

POLYGYNIA.

DILLENIA.

1. DILLENIA. *Hort. cliff.* 221. *indica.*
Syalita. *Rheed. mal.* 3. *p.* 39. *t.* 38. 39.
Habitat in Malabaria. ♄

LIRIODENDRON.

1. LIRIODENDRON. *Hort. cliff.* 223. *Hort. upſ.* 154. *Tulipifera*
Gron. virg. 60. *Roy. lugdb.* 494.
Tulipifera arbor virginiana. *Herm. lugdb.* 612. *t.* 613.
Tulipifera virginiana, tripartito aceris folio: media lacinia velut abſciſſa. *Pluk. alm.* 379. *t.* 117. *f.* 5. & *t.* 248. *f.* 7. *Catesb. car.* 1. *p.* 48. *t.* 48.
β. Tulipifera caroliniana, foliis productioribus magis anguloſis. *Pluk. alm.* 379. *t.* 68. *f.* 3.
Habitat in America *ſeptentrionali.* ♄

MAGNOLIA.

1. MAGNOLIA. *virginiana.*
Magnolia foliis ovato-lanceolatis. *Hort. cliff.* 222. *Gron. virg.* 61. *Roy. lugdb.* 493.
α. Magnolia foliis ovato-lanceolatis ſubtus glaucis. *Anon.* glauca.
Magnolia lauri folio ſubtus albicante. *Catesb. car* 1. *p.* 39. *t.* 39. *Dill. elth.* 207. *t.* 168. *f.* 205.
Tulipifera virginiana, laurinis foliis averſa parte rore cæruleo cinctis, coni-baccifera. *Pluk. alm.* 379. *t.* 68. *f.* 4.

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[*Magnolia amplissimo flore albo, fructu caeruleo* Plumier, Nova Pl. Amer. Gen. (1703): 38-39, t.7].

Talauma caerulea Jaume St.-Hilaire, Expos. Fam. Nat. 2 (1805): 76 (as '*cerulea*').

Magnolia fatiscens Richard ex A.P. de Candolle, Syst. Nat. 1 (1817): 460, pro syn.

Magnolia linguifolia Linnaeus ex Descourtilz, Fl. MÈd. Antilles 2 (1822): 140.

Talauma coerulea Steudel, Nomencl. Bot. ed. II(2) (1841): 660 (merely a different spelling).

The epithet *dodecapetala*, published by Lamarck in 1786, remained unnoticed for well over a century. Nevertheless, it's the first valid name and it takes precedence over all names published on later dates.

Linnaeus' *Magnolia*

Linnaeus took up the name *Magnolia* in 1735 in his *Systema Naturae* (just the name, no description) and in 1737 in his *Genera Plantarum* (with a description of the genus). In the first edition of *Species Plantarum* he finally applied it to the species *Magnolia virginiana*. This however is not Plumier's species and the question has been raised whether Linnaeus did this on purpose or whether he just had no

knowledge of Plumier's publication.[3] To answer this question it's not enough to look at the account of the genus in Species Plantarum alone.

Magnolia in the first edition of *Systema Naturae*

When Linnaeus first took up the name *Magnolia* in 1735, he placed it in Polyandria Polygynia with a reference to Plumier. On the same line however, following it, the genus *Tulipifera*, which we now know as *Liriodendron*, was listed as a synonym. This tree had been grown in Botanical Gardens in England and Holland for some time by then.[4] Hermann (1646-1695) already had an account of it (as *Tulipifera arbor virginiana*) in 1687 in his *Horti Academici Lugduni-Batavi Catalogus* [A Catalogue of Leyden Botanical Garden], and Linnaeus must have seen the species while in Leyden. We may therefore conclude that he had only a marginal acquaintance with the genus *Magnolia* at that time.[5] As we know that the printing of *Systema Naturae* began on June 30, 1735 but that Linnaeus finished the manuscript of the tables only on July 15 and that Gronovius assisted him in this work, it may very well be that Linnaeus only added *Magnolia* to the table on Gronovius's advice, not having seen Plumier's account himself.

Later treatment

A year and a half later—Linnaeus has had time to study Clifford's library (including Plumier's work) and has visited Dillenius in England—we find a totally different account in his *Genera* (1737). *Magnolia* and *Liriodendron* are recognized as different genera[6] and to *Magnolia*, a reference to *Dill. elth.* 168 [Dillenius's *Hortus Elthamensis* (1732)] is added. In that same year the text of *Hortus Cliffortianus* was printed and here we find another interesting reference under *Magnolia: Catesb. ornith.* 39 [Catesby's *Natural History of Carolina* (1730)]. What's so interesting about these two references is that they actually refer to pages where the name *Magnolia*, with illustrations that absolutely leave no room for doubt, is applied to the species that Linnaeus later named *Magnolia virginiana* var. *glauca (Magnolia virginiana)*. A closer look at both publications tells us that the person who was responsible for the taxonomic part was not the author but, in both cases, the botanist William Sherard![7] Here we sense smoke. But is there a fire?

Magnolia dodecapetala; this is the species from Martinique that was the first to receive the name *Magnolia* in 1703. (Photo by Arlington James.)

William Sherard

Sherard (1659-1728) never published important (if any) books himself—although he saw Hermann's *Musaeum Zeylanicum* (1717) through the press—but, in his time, he was a very respected naturalist, the friend and correspondent of nearly every major botanist of his age, and founder of the Sherardian Chair of Botany at Oxford (by an endowment), which Dillenius held at the time of Linnaeus' visit. A considerable number of letters to and from him survive today. He took part

of his education in Paris, between 1685 and 1688 so it's very likely that he met with Plumier, who at that time was a pupil of the famous botanist Tournefort (1656-1708)—himself a student of Magnol—and only left for the Antilles in 1689. In the end, it's most probable that William Sherard promoted Plumier's name *Magnolia* and that we should hold him responsible for its transfer from a tropical to a temperate species, many years before Linnaeus did the same in *Species Plantarum*.

Linnaeus' acquaintance with Plumier's Magnolia

Did Linnaeus know Plumier's species or did he overlook it? The answer lies in the *Hortus Cliffortianus* and even in the *Species Plantarum* itself. In the account of Clifford's library [in *Hortus Cliffortianus*] no less than four works of Plumier are listed, including *Nova Genera*, and Linnaeus' comments upon Plumier being an excellent botanist here.[8] Plumier's description and plate are listed in the synonymy of *Magnolia* in the *Hortus Cliffortianus*. Finally, in the *Species Plantarum*, Plumier's species is listed as a synonym under *Magnolia virginiana* var. *foetida (Magnolia grandiflora)*. Plumier's species certainly did not escape Linnaeus' attention, he just saw not enough differences to separate it from var. *foetida*. This may have been due to the poor quality of Plumier's figure; it may also illustrate the problems Linnaeus faced when he had to decide whether taxa were different or not, in the absence of specimens of the plant(s) concerned. Strangely enough, in later treatments he drops Plumier's species from the synonymy but doesn't grant it specific or varietal status either.

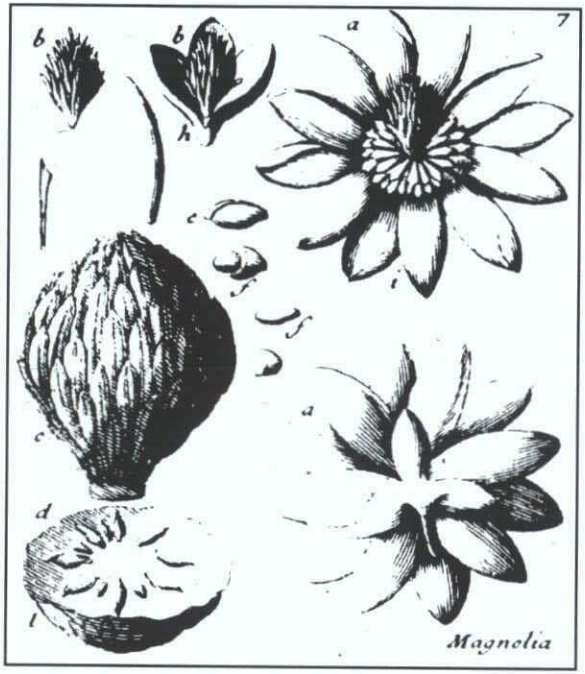
Clayton's specimen of *Magnolia virginiana*

There's one important remark that should be made here. While at Hartekamp, Linnaeus got to see Clayton's specimen[9] of *Magnolia virginiana* (now in the Clifford Herbarium in the British Museum; an account of Clayton's specimens was given by Gronovius in 1739 in *Flora Virginica*[10]). Linnaeus may even have seen the species alive during his one-month visit to Dillenius in 1736.[11] He must have noticed at once that this was totally different from *Liriodendron*, hence the radical change in his treatment of the genera in 1737. Also we know that he considered the real plant (living or dried) a far better source to base a species upon than a picture or description. He must have stuck to this rule in the case of *Magnolia*, where he even based a genus upon the Clayton specimen, while of Plumier's species he had only seen a description and a poor figure.

Liriodendron

Linnaeus' first mention of the Tulip tree was as *Tulipifera in Systema Naturae* (1735). A year and a half later he changed its name to *Liriodendron* and that's the name we find in the *Species Plantarum*, from where it takes precedence over other names. The genus was based upon Catesby's *Arbor Tulipifera Virginiana*. The oldest reference in *Hortus Cliffortianus* and in the *Species* is the one to Hermann's *Tulipifera arbor virginiana* (1687).

Changing an existing genus name was something Linnaeus did very often and for which he was heavily criticised by his contemporaries.[12] It has led to much confusion and numerous superfluous synonyms when later taxonomists disagreed with the new names and changed them back. The last to make an in-



A poor reproduction (from a microfiche) of Plumier's rather poor plate of his Magnolia.

dustry of this was Otto Kuntze at the end of the 19TH century.[13] Today botanists agree upon the principle of using the first edition of Linnaeus' *Species Plantarum* as the starting point for nomenclature and have learned to live with that.

Michelia

In the first editions of *Genera Plantarum* (1737 and 1742) and in his *Flora Zeylanica* (1747), Linnaeus classifies *Michelia*[14] under *Octandria Polygynia* (eight stamens, numerous pistils). In the *Genera* he gives a reference to HM 1: 19 [Rheede's *Hortus Indicus Malabaricus* (1678)] where we find the species as *Champaca*[*m*]. Rheede's t[abula] 19 is a figure in which we see the flowers depicted with the inner tepals connivent, much like *Magnolia stellata* flowers at anthesis, hiding the gynandrophore. The accompanying description lacks information on the number of stamens and pistils. It only reports that the outer two of three whirls of tepals consist of about eight tepals each and that the stamens are placed in a circle under the gynoecium. Linnaeus placed it in Polygynia probably based upon the number of carpels in the depicted fruit (which, by the way, looks more like a bunch of grapes). In the *Species Plantarum* Linnaeus finally places the genus in *Polyandria*, with one species, *Michelia champaca*[*m*] and this is another example of his coining a new name for the genus and using the old generic name for the specific epithet. *Michelia* was named after Pietro Antonio Micheli (1679–1737), professor of Botany in Pisa, curator of the Florentine Botanical Garden, leading authority on Cryptogames (non-flowering plants) and author of *Nova Plantarum Genera* (1729), from which Linnaeus took several of his own genera.

In the *Species*, Linnaeus gives only three references for *Michelia*, the first one being to *Flora Zeylanica* (1747) where a complete synonymy can be found of six different names with references to nine works. At first sight it seems odd that in *Flora Zeylanica* Linnaeus still placed *Michelia* in Octandria, while we know this work was entirely based upon preserved specimens collected by Hermann (now in the British Museum), which Linnaeus received on loan in 1744—so you think he could have counted stamens or their scars. Hermann's specimen (FZ 144), however, appears to be a leafy shoot with no flowers or fruits.

Varieties of *Magnolia virginiana*

The genus *Magnolia* in the *Species Plantarum* is listed with one species (*virginiana*) and five varieties (*glauca, foetida, grisea, tripetala* and *acuminata*). In describing varieties, Linnaeus used the same practice as modern botanists do: the type species becomes the first variety, repeating the specific epithet in its varietal name, the new variety becomes the second one. Thus, Linnaeus starts to "number" his varieties with the Greek *beta*, the *alpha* being reserved for the typical variety. In *Magnolia virginiana* however (and in a small number of other species), the first variety *(glauca)* is listed as var. *alpha*. At the end of the account of *Magnolia virginiana*, Linnaeus indeed expresses his suspicion that these varieties are in fact distinct species.[15]

In his subsequent treatment of *Magnolia*, in the tenth edition of *Systema Naturae* (1759), he raised four varieties to specific status, at the same time merging var. *grisea* with var. *glauca* into his *Magnolia glauca*.

var. β foetida

In the list of synonyms that Linnaeus gives for var. *foetida*, the last one is *Magnolia flore maximo albo foetido, foliis deciduis amplis, florem*[16] *ad ramulorum seriem sphaerice cingentibus, fructu majori, Gron. virg.* 61. [Gronovius's *Flora Virginica* (1739)]. It's the only phrase-name containing the word *foetid*[*us*] (stinking) that's listed with this variety and thus Linnaeus most probably took the epithet *foetida* from this name. It has always been a mystery to me why a tree with fragrant flowers like *Magnolia grandiflora* at one time was named var. *foetida* (Sargent even called it *Magnolia foetida* but a name does not have priority outside the rank in which it was published and Linnaeus had called the species *Magnolia grandiflora* before). The translation of Gronovius's phrase-name is: *Magnolia* with very large white stinking flower[s] and large deciduous leaves, surrounding the flower in a whorl at the top of the branchlets, fruit[s] large. This description perfectly fits... *Magnolia tripetala*! According to *Flora Virginica* the taxon is typified by Clayton 24,[17] now in the Clayton Herbarium in the British Museum. Clayton 24 is a flower with at least nine rather pointed tepals, and is at a glance recognized as *Magnolia tripetala* indeed! Linnaeus himself must have noticed the error as he completely omits Gronovius's name in later treatments and changed the epithet *foetida* to *grandiflora* when he raised it to specific status, while he left the other epithets unchanged. With the inclusion of Plumier's and Gronovius's names, it's clear that in the synonymy of this variety, three taxa are listed that are now recognized as distinct species.

var. ε acuminata

The phrase-name given for this variety is: *"Magnolia flore albo, folio majore acuminato haud albicante."* [*Magnolia* with white flowers, rather large leaves, acuminate, not at all whitish.] with references to Catesby (1747) and Gronovius (1739). We know *Magnolia acuminata* has yellowish or green flowers so why did Linnaeus describe them as white? In *Flora Virginica* on page 61 we find only the above phrase-name[18] and Clayton 404 cited as the type specimen. In t.15 in the appendix to volume 2 of *The Natural History of Carolina* we see a twig with *Magnolia acuminata*-like leaves and a white flower with ten tepals depicted. In the accompanying description we read: "The flower is five inches wide, consisting of twelve

white petals, [...] The cone, when full grown, is as big as a small hen's egg, but a little longer, and of the like structure with the rest of the Genus. It flowers the first of all the kinds of Magnolia, which I think is in April. Specimens [...] were first sent me in the year 1736 by [...] John Clayton..." Both Catesby and Gronovius received their specimens from Clayton and had to rely on his additional written information. Clayton 404 (what's left of it now in the British Museum) is a leafy shoot with a large terminal flower bud so Clayton collected it before it came into flower. As he mainly collected in Gloucester County, which lies on the bank of Chesapeake Bay, and the nearest *Magnolia acuminata* was at least 200 kilometres away, it's most likely he did never see a flower himself.[19] It's unclear from where he took the description of the *virginiana*-like flower and the *grandiflora* or *Rhytidospermum*-like fruit.

Linnaeus had very poor material to base his taxon upon. Catesby's plate turns out to be a chimaera and the only reliable element he had was Clayton's specimen,[20] which didn't reveal much about the flower. In later treatments, Linnaeus adds his own phrase-name *(Magnolia foliis ovato-oblongis acuminatis)* and a reference to Miller's *Gardener's Dictionary*, but even in the second edition of *Species Plantarum* (1762), the diagnostic characters are still based upon the leaves, while no attention is paid to the peculiar flower of this species.[21]

The anonymous author

In the treatment of *Magnolia* for the varieties *glauca, foetida* and *grisea,* Linnaeus first lists a phrase-name, attributed to an anonymous author. This is strange for someone who pays so much attention to his references. Did he do this out of modesty then and were these names in fact his own? Although Linnaeus was not particularly a meek or modest person (see for instance Hopkins, 1977), in some cases he acted as if he were, like when he named *Linnaea borealis*, "the most humble of plants," after himself. There are however numerous cases in other genera where he coined a phrase-name and did not attribute it to anyone (so it's clear they are his own). There is a possibility that the names in question are from the work of an artist or botanist that was indeed published anonymously, although I have not been able to trace such a work, so far.[22] If this work is identified, it might reveal that the first name listed under var. *foetida* now[23] is in fact *Magnolia tripetala*. Ehret[24] had a magnificent figure published in Trew's *Plantae Selectae* (t.LXII, 1765) which, under a very similar name, clearly depicts *Magnolia tripetala*.

Concluding remarks

Linnaeus' account on *Liriodendron, Magnolia,* and *Michelia* in *Species Plantarum* comprises less than two pages, yet it's clear there's much information that lies beneath it. The *Species* is in most cases best regarded as a catalogue of synonyms and references, providing access to a vast body of knowledge that was present at that time already, and that was examined and arranged by Linnaeus. I hope this article made clear what problems he faced and that he did not always achieve the best results in his first attempt to put the classification of the past into order.

The *Species Plantarum* caused a revolution in nomenclature and systematics almost immediately. Looking back it is also clear that it came at the right moment as it provided a solid base at the time botanists started to move all over the world, describing a vast amount of new species. It may be illustrative that

Augustin Pyramus de Candolle (1778–1841) and his son Alphonse (1806–1893), in the *Prodromus*, the last attempt to make a world flora, between 1824 and 1873 included 58,000 species already!

In order to keep this article enjoyable for the reader, I added notes only if they could provide extra information, and not if they would do no more than merely account for the exact sources of my information. For questions or remarks, you can reach me on the internet at the Magnolia newsgroup: **http://groups.yahoo.com/group/magnolia** (where we exchange all kinds of valuable information). If you're not a member yet, just sign in, it's free!

The only remark that remains for me to make is that I hope it will be a great party when we commemorate the 250TH anniversary of the *Species* and that of *Magnolia* of course!

Notes

1 See page 75 of W.T. Stearn's introduction to the 1957-59 facsimile edition of the *Species*, don't think I just state this because I'm Dutch.

2 As you know, Plumier's *Magnolia* was named after Pierre Magnol (1638-1715). He is often referred to as director of the Montpellier Botanical Garden and author of *Botanicum Monspeliense* (1676) and *Hortus regius Monspeliensis* (1697), both of which are true. His most important contribution to science however is often overlooked (at least in Magnolia literature): Magnol fathered the concept of plant families, based on morphological characters (in his *Prodromus historiae generalis plantarum, in quo familiae plantarum per tabulas disponuntur* of 1689). This may seem a bit trivial for us now but it certainly wasn't during his lifetime. Remember that it was not until 1859 that Darwin unfolded his theory on evolution and in Magnol's days the common belief was that all species had come into existence by divine creation at one time as set out in the book of Genesis, in which case there's no cause to assume family ties between species. It may be only a coincidence that Magnol was in conflict with the Roman Catholic Church, just like Galileo Galilei was half a century before.

3 Treseder, in *Magnolias* (1978) p. 1, writes that Linnaeus "took up Plumier's generic name *Magnolia*. However, as he had only scanty information about Plumier's Martinique plant, he based his own generic description on [...] *M. virginiana* L. [...]. By so doing he unintentionally transferred the name *Magnolia* from a tropical genus to one which includes temperate species..." on p. 71 he even writes that "The generic name *Magnolia* was not adopted by [...] Linnaeus until 1753..."; Callaway, in *World of Magnolias* (1994) p. 17, writes that *Magnolia* was named by Carl Linnaeus in 1737 in honor of the French botanist Pierre Magnol; Rankin, in *Magnolia a Hamlyn care manual* (1999) p. 13, writes that "It was Linnaeus who unintentionally applied the name *Magnolia* to what we now know as *Magnolia virginiana*." Also in many essays authors either hold Linnaeus responsible for the naming of the genus or state he unintentionally transferred the name to another species.

4 The "Tulip Poplar" was introduced to England between 1638 and 1654 by John Tradescant the younger (1608-1662), who collected plants in America on behalf of King Charles I (1600-1649) and brought it home from Virginia on one of three trips.

5 It is well-known that the "Sweet Bay" had been introduced to England by John Banister in 1688 already. The first time a *Magnolia* is mentioned as *growing* in a Dutch garden however is when Adriaan van Royen (1704-1779) lists it in his *Florae Leydensis Prodromus* (1740), together with *Liriodendron*. The work gives no information on the dates of introduction of the plant(s) but *Magnolia* may very well have been introduced to Leyden Botanical Garden only after 1735.

6 *Magnolia* is listed on p. 162 as genus no. 456, *Liriodendron* ('*Liriodendrum*') as no. 960 on p. 9 of the *Corollarium* (supplement), so it must have been late in the preparation of this

work that Linnaeus decided upon the treatment of *Liriodendron* (the *Corollarium* had its own pagination but was bound with the first edition of *Genera Plantarum*).

[7] Mark Catesby (1683-1749) who collected in Virginia between 1712 and 1719 and in Carolina between 1722 and 1726, in his preface to *The Natural History of Carolina*, on pp. v and XII states that the most celebrated botanist the late William Sherard gave the plants he collected and pictured their Latin names, Catesby himself not being a Latin scholar.

Dillenius's *Hortus Elthamensis* is a catalogue of the plants growing in the garden of James Sherard (William's brother) in Eltham, Kent (now in the suburbs of London). It was William Sherard who, together with his pupil Dillenius, built up the garden into one of the leading gardens in England. There's every reason to assume that from the both of them, Sherard did the major part in the selection and naming of the species in the garden, and that Dillenius followed his nomenclatural vision although he only after William's death started to compile the *Hortus Elthamensis*.

[8] Linnaeus writes: "*Inter americanos fere unicus vere doctus Botanicus*" [between the authors on the American flora a nearly unparalleled and truly learned botanist]. Many of his own genera were directly taken from Plumier. It's undoubted that Linnaeus was very familiar with Plumier's works.

[9] John Clayton (1694-1773) was one of the early collectors of plant specimens in Virginia, from where he sent them to Catesby and Gronovius. Clayton's specimen 34 was acquired by Clifford and is now kept as Clifford Herbarium 222 in the British Museumm (BM). It became the lectotype of *Magnolia virginiana* (rather loosely designated as such by J.E. Dandy in Curtis's Bot. Mag. 175 (1964): t.457). The other *Magnolia* specimens he sent are Clayton 24 (received 1734 according to the label) and Clayton 404. Clayton 16, representing the Tuliptree, is not in BM. The other specimens can be viewed at the website of the British Museum: **http://www.nhm.ac.uk/botany/historical/index.html**

[10] This first edition of *Flora Virginica* had been completed before September 1738 but Gronovius waited with its publication until the *Hortus Cliffortianus* was published (with considerable delay). As Linnaeus helped Gronovius to classify Clayton's specimens for *Flora Virginica* until he left by May 1738, he must have seen the ones that occur in the first edition.

[11] Treseder, in *Magnolias* (1978) p.72, writes that *Magnolia grandiflora* had been introduced into England in 1728 or before but had become very rare by 1731 due to some severe winters, so Linnaeus may have missed it.

[12] In many cases Linnaeus changed the name of a genus because it had the form of an adjective and in his aphorism 235 in *Fundamenta Botanica* (1736) he had stated that *Nomina generica Adjectiva substantivis pejora sunt* [generic names in adjective form are less suitable than those in substantive form] so, as is the case in *Tulipifera*, he just abided by his own rules.

[13] Kuntze (1843-1907) in *Revisio generum plantarum* (1891-98) changed about 3000 existing names. In the process he abandoned the generic name *Michelia* for *Sampacca* of Rumphius (1741) and reintroduced *Tulipifera* for *Liriodendron*, creating the superfluous name *Tulipifera liriodendron*.

[14] Recent data, both molecular and morphological, show that, if *Magnolia* is to be treated as a monophyletic group, *Michelia* can no longer be upheld as a separate genus (the consequence of granting generic status to *Michelia* would be that subgenus *Yulania* were to be placed outside genus *Magnolia* too). My treatment here reflects that of Linnaeus and does not mean that I support its generic status.

[15] Linnaeus writes: "*Utrum hae:* α. β. γ. δ. ε. *sint distinctae, determinent autoptae in solo naturali? harum.*" [whether or not these varieties are distinct [species] could examinations in their natural ground assess.]; the question mark after *naturali* may indicate that he reckoned with the possibility that some of these were in fact cultivated varieties and had no natural ground, like so many of the monstrosities he had seen in the bulb-growing industry in Holland.

[16] In the *Species* this substantivum is printed as *florum* (genetivus pluralis) which makes no sense and would leave the participium *cingentibus* without an object (accusativus): in *Flora Virginica* we indeed find *florem* (accusativus singularis) as the correct form so *florum* is an error in the citation.

[17] It's quite certain Linnaeus has seen this specimen: see notes 9 and 10.

[18] In Gronovius's phrase-name, the word *subtus* [underside] is inserted before *haud* —which makes it more explicit that this character (non glaucus leaf underside) is compared with *Magnolia virginiana*.

[19] Treseder, in *Magnolias* (1978) p.127, reports that the species first flowered in England in 1762, too late for Catesby and Gronovius to check Clayton's description of the flower.

[20] As Catesby received his specimen in 1736 and Gronovius obtained his specimens of Clayton from the same shipment via Catesby, this one arrived well in time for Linnaeus to study it, so it can be considered an original element (and may thus serve as a lectotype); also see note 10.

[21] This is particularly remarkable as Linnaeus regarded the fructifications (flowers and fruits) as the best parts of the plant to provide diagnostic characters and base genera and species upon.

[22] J.L. Heller, on p. 12 of the appendix to the 1957-59 facsimile edition of the *Species Plantarum* suggests this work may have been a monograph on *Magnolia*.

[23] The first name listed for var. *foetida* is: "*Magnolia foliis ovato-oblongis subtus viridibus*" [*Magnolia* with ovate to oblong leaves with green lower surfaces].

[24] Georg Dionysius Ehret (1708-1770), famous botanical artist, met with Linnaeus in Holland, did the majority of the plates in *Hortus Cliffortianus*. The German physician Christoph Jakob Trew (1695-1769) commissioned him to do the plates of *Plantae Selectae*, among which plate 62: "*Magnolia foliis ovato oblongis, ad basin et apicem angustis, utrinque virentibus.*"

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Errata

Several errors were uncovered in Issue 72:

Page 4, first bullet item near the bottom of the page. *M. sieboldii* 'Ferris Miller' was actually registered as *M. sieboldii* 'Min Pyong-Gal.'

Page 11, Figure 1 photo caption should read: Fruit cross section of *M. macrophylla* (right) showing thick 0.4in (10cm) mesocarp compared to the relatively thin mesocarp of *M. grandiflora* (left).

Page 11, Figure 2 photo caption should read: "Backwards" dehiscent carpels of *M. hodgsonii* (right) and *M. grandiflora* (left).

Page 28, 7th and 8th lines: "subgenus Maingola" should read "subgenus Magnolia."