

A survey of some of the pre-Linnean history of the genus *Acacia*

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ABSTRACT

The pre-Linnean history of the plants referred to the genus *Acacia* to some extent reflects the development of botanical description, classification and illustration. Attention is drawn to some of the earliest references to plants known to belong to the genus *Acacia* and to references in selected herbals and publications up until Philip Miller's description of the genus in the fourth abridged edition of his *Gardeners Dictionary* in 1754.

RÉSUMÉ

REVUE DE QUELQUES ÉLÉMENTS DE L'HISTOIRE PRÉ-LINNÉENNE DU GENRE ACACIA

L'histoire pré-linnéenne des plantes rattachées au genre *Acacia* reflète jusqu'à un certain point le développement de la description, de la classification et de l'illustration en botanique. On attire l'attention sur certaines des références les plus anciennes à des plantes connues comme appartenant au genre *Acacia* ainsi qu'à des références puisées dans un choix d'herbiers et de publications antérieures à la description faite de ce genre par Philip Miller dans la quatrième édition abrégée de son "*Gardeners Dictionary*" en 1754.

INTRODUCTION

Although of no standing in present-day nomenclature, it is nevertheless of considerable interest to trace the pre-Linnean history of the plants now referred to the genus *Acacia* as to some extent it mirrors the development of botanical description, classification and illustration.

From the beginning, plants, particularly those of utilitarian value, attracted the attention of man and the use of plants for medicinal purposes long preceded any description of the plants themselves. Since very early times a variety of herbs was used as healing agents and it had become necessary to study them in detail in order to be able to differentiate the kinds employed for different purposes. In the words of Stearn (1958), "Botany as a science was fashioned out of herb-lore at Athens when Theophrastus (370-285 B.C.) applied to the vegetable kingdom the principles of classification based on logic associated with his teachers Aristotle and Plato."

Attempts were made to classify plants in the earliest works on natural history. Theophrastus in his *Enquiry into Plants* considered the principles of classification suggesting that the vegetable kingdom be classed into trees, shrubs, under-shrubs and herbs and that minor divisions should be based on differences such as those between flowering and flowerless and deciduous and evergreen plants. In addition, he hinted at an ecological classification.

A number of manuscript herbals were written in western Europe during the centuries that elapsed between the end of the classical period and the end of the fifteenth century. Theophrastus, Dioscorides and Pliny either gave no descriptions to the names of the plants or they described them so inadequately that it was probably difficult even then, as it still is now, to identify many of the plants referred to in their works. The writers of the early herbals sought to recognize in the plants of their own country those of classical antiquity named by Theophrastus, Dioscorides and Pliny as it was at first assumed that the plants described by the Greek physicians grew wild throughout Europe. As a consequence, each author identified a different native plant with one

mentioned by Theophrastus or Dioscorides or others thereby creating much confusion so that the reader of one work can in many instances never be sure whether the plant referred to by a certain name is the same as a plant with the same name in the work of another author. A description of a plant during the early sixteenth century is therefore usually accompanied by a critical enquiry as to whether the usage of the name agrees with the use to which it was put by other authors. Many of the early works showed little originality being copies of copies of yet earlier copies. During this copying process errors were introduced and descriptions of quite common plants were borrowed from earlier works and embellished with superstitions so that many departures were made from the original texts.

As many of the herbalists were medical men probably one of the objects which early herbalists had in mind when writing their books was to enable the reader to identify the herbs used in medicine. However, until the sixteenth century was well advanced the illustrations generally provided in herbals were often so stylized and the descriptions so inadequate that it must have been extremely difficult to identify many of the plants solely by reference to these works. Arber (1938) suggested that the knowledge of plants was transmitted by word of mouth and that the herbals were only used as reference works in which to seek information about plants whose identity was already known to the reader.

A significant advance occurred when the authors of herbals and other works based their descriptions on the actual plants that they had before them instead of copying earlier descriptions. The descriptions were not very methodical initially but they slowly became more systematic. The herbals of the late sixteenth century mostly contain descriptions of plants known to the author from the immediate environment of his native land. Later authors endeavoured to present a more comprehensive account in each herbal by recording all plants noted by predecessors whether or not they had seen them and adding the previously unknown plants that they had seen themselves. In contrast with previous centuries, the merit of each new herbal came to depend upon the number of plants added from the authors' own observations and not on what the author had copied from predecessors. As each author wished to include in his work as many

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new plants as possible, the number of plants described grew fairly rapidly. Fuchs (1542) described about five hundred species but by 1623 the number of species enumerated by Caspar Bauhin in his *Pinax theatri botanici* had risen to six thousand.

As a product of the process of compiling descriptions the similarities and differences between plants became more apparent to authors along with the realization that some of the affinities had little to do with the medicinal properties or agricultural importance of the plants. A significant advance occurred when information relating to medical superstition was omitted from the descriptions and the perception of natural affinities among plants awakened a desire to distinguish more precisely whatever was different and to bring together more carefully whatever was similar (Sachs, 1890). This perception of resemblances and differences of form developed and led in turn to the idea of natural relationships and systems of classification. The recognition of natural groups is found in the later herbals from the late sixteenth century onwards, and the series of works published between 1530 and 1623, from Brunfels to Caspar Bauhin, reflects how the perception of a grouping of affinity grew more and more distinct.

Caspar Bauhin (1623) considered the arrangement of plants in his *Pinax theatri botanici* to be of the greatest importance and his system was far ahead of those of his predecessors. He employed the system which de l'Obel had used in 1576 in his *Plantarum seu stripium historia* but carried it out more thoroughly. Caspar Bauhin consistently used the binary system of nomenclature, which Linnaeus is often thought to have founded, each plant bearing a generic and a specific name, although sometimes a third or even a fourth descriptive word was added. However, these additional words are apparently only auxiliary and not essential. In his *Pinax*, Caspar Bauhin also sought to put an end to the nomenclatural confusion which had arisen by listing for each species known to him all of the names that had been applied previously by earlier writers.

The art of botanical illustration and the development of plant descriptions proceeded at different rates and to an extent independently of one another. The first millenium of the history of plant illustration shows no steady advance from primitive work to naturalistic, but rather a gradual decline which was not fully arrested until the early sixteenth century with the appearance of Weiditz's illustrations in Brunfels's *Herbarium vivae eicones* (Blunt, 1955). Remarkable examples of some very early large-scale brush drawings are found in the *Codex Aniciae Julianae* of Dioscorides's work. This work was made at Constantinople about the year 512 A.D. but it appears that some of the illustrations were derived from those made by Crateuas who was personal physician to King Mithridates (120–63 B.C.) (Arber, 1938; Stearn, 1954; Blunt, 1955).

As species of *Acacia* occur in the Nile Valley in Egypt and in the middle east it is not surprising that references to plants now known to belong to this genus can be traced back almost to the earliest recorded history. Reference to the genus is found in texts of the ancient Egyptians, in the Bible, and in the writings of classical antiquity. Of course, as is to be expected, many of the plants referred to by the names *Acanthus*, *Acanthos*, *Akakia*, *Acatia* and *Acacia* were unrelated and many are excluded from the present generic concept of *Acacia*.

Attention is drawn in this paper to some of the earliest references to plants known to belong to the genus *Acacia* and to references in selected herbals and publications leading up to Philip Miller's description of the genus in 1754.

THE ANCIENT EGYPTIANS

Species of *Acacia* have flourished on the banks of the river Nile in Egypt for thousands of years and, according to Rochebrune (1899), the ancient Egyptians were familiar with *A. nilotica* (L.) Willd. ex Del. and *A. seyal* Del. and very probably *A. tortilis* (Forssk.) Hayne and perhaps even *A. senegal* (L.) Willd. The name of *A. nilotica* is found in contemporary texts of the pyramids and, of all of the *Acacia* species, its name occurs most commonly in inscriptions in religious and historical texts and in literary and medical papyri. The most frequently used symbol to depict the species is a pod which represented a figure in hieroglyphics. Rochebrune noted that *A. nilotica* is represented on the tomb of Menephtha of the eighteenth dynasty at Beni-Hassan.

Flückiger & Hanbury (1874) record that the Egyptian fleets brought gum arabic from Arabia as early as the seventeenth century B.C. and that there were representations of the trees, together with heaps of gum, in the treasury of King Rhampsinit (Ramses III) at Medinet Abu. The symbol used to signify gum arabic, which was largely used in painting, is frequently encountered in Egyptian inscriptions.

The ancient Egyptians used the flowers of *Acacia* for crowns and garlands, some of which adorned the mummies of certain kings. *A. nilotica* was sometimes placed among the offerings on the altars of the Gods but there is no evidence of its having been sacred, while *Acacia* wood is reputed to have been used to clamp shut mummy-coffins made of sycamore.

THE BIBLE

There is almost universal agreement that the plant referred to in the Bible by the Hebrew word "shittah" (singular) or "shittim" (plural) is a species of the genus *Acacia*, three or four of which occur in biblical lands (Moldenke & Moldenke, 1952). The Bible (The Authorized Version of King James) contains numerous references to shittim-wood particularly in connection with the ark of the Tabernacle which was ordered to be made of this wood. For example, in Exodus 25: 5, 10, 13, 23 and 28—

"And rams' skins dyed red, and badgers' skins, and *shittim wood*. . . And they shall make an ark of *shittim wood*: two cubits and a half shall be the length thereof, and a cubit and a half the breadth thereof, and a cubit and a half the height thereof. . . And thou shalt make staves of *shittim wood*, and overlay them with gold . . . Thou shalt also make a table of *shittim wood* . . . And thou shalt make the staves of *shittim wood*."

Smith & Fuller (1893) record that the predominant use of the plural form of the word in the Scriptures, that is "shittim" rather than "shittah", is probably because the trees are usually gregarious and seldom occur singly. In the Revised Version of the Bible the terms "acacia tree" and "acacia wood" are used.

According to Moldenke & Moldenke (1952), most authorities are of the opinion that *A. seyal* or *A. tortilis* are the most likely species involved in these references. Both species are seemingly able to flourish in dry areas and *A. tortilis* is the largest and commonest tree on the deserts of Arabia where the Israelites wandered for forty years and is especially conspicuous

on Mount Sinai. Although usually shrubby or twisted and gnarled in desert areas, in favourable localities *A. tortilis* may attain a height of 15 metres. Its wood is very hard, close-grained and durable and thus admirably suited for use in the construction of the ark of the Tabernacle.

Other authors feel that *A. seyal* is more probably the species referred to while *A. nilotica* may also be involved. The almost complete absence of references to the "shittah" tree in the later books of the Bible suggests that the tree was not a native of northern Palestine.

It has also been suggested (Feliks, 1971) that *A. albida* Del. may be the species in question as it grows in the Jordan Valley near the mouth of the river Yarmuk. *A. albida* is an erect tree with hard light wood which would have provided timber of suitable lengths for the construction of the ark.

In the books of Numbers, Joel, Joshua and Micah the word "shittim" is used as a place name probably, according to the Authorized Version, because of the abundance of acacias at those places at that time. The "Abel-shittim" of Numbers 33:49 literally means "the meadow (or moist place) of the acacias."

The acacia of the Bible is not *Robinia pseudo-acacia* L., the common black locust of eastern North America. This species was confined to North America in biblical times and was only introduced into Palestine at the end of the seventeenth or the beginning of the eighteenth century.

While there is little doubt that the word "shittim" refers to a species of *Acacia*, there is much controversy about the following verses of Exodus 3: 2-4:

"And the angel of the Lord appeared unto him in a flame of fire out of the midst of a bush: and he looked, and, behold, the bush burned with fire, and the bush was not consumed. And Moses said, I will now turn aside, and see this great sight, why the bush is not burnt. And . . . God called unto him out of the midst of the bush."

One of the possible explanations discussed by Moldenke & Moldenke *l.c.* is that the "flame of fire" may have been the brilliant crimson-flowered mistletoe, *Loranthus acaciae* Zucc., which grows in profusion on *Acacia* species in Sinai and in biblical lands. The crimson flowers of the mistletoe stand out conspicuously against the green foliage and yellow inflorescences of the host plant and some authorities are of the opinion that the story of Moses and the "burning bush" may be an allegory referring to the flame-like appearance of the mistletoe among the branches of an *Acacia*.

THE WRITINGS OF CLASSICAL ANTIQUITY

Scientific botany owes its origins to curiosity about the medicinal properties of plants. Theophrastus (370-285 B.C.), the distinguished Greek philosopher, who was first a disciple of Plato and afterwards the favourite pupil of Aristotle, applied to the vegetable kingdom the principles of classification based on logic associated with his teachers (Stearn, 1958). This is revealed in his work which has come down to us entitled *The Enquiry into Plants*. *The Enquiry into Plants* is chiefly concerned with the plants of the Mediterranean region around Greece, but it also contains some of the observations made during Alexander the Great's military expedition into Asia in the years 331-323 B.C. It is not known from what source Theophrastus first became acquainted with species of *Acacia* but the following mention is made

in the *Enquiry* of acacias which he would have had an opportunity of seeing in Egypt during his visit to the country at the invitation of Ptolemy:

"Thus in Egypt there are a number of trees which are peculiar to that country, the sycamore the tree called *persea* the *balanos* the acacia and some others." (Theophrastus, *Enquiry* IV, ii, 1; transl, Hort 1: 291, 1916).

Theophrastus continued (IV, ii, 8; transl. Hort 1: 299, 1916):

"The *akantha* (acacia) is so called because the whole tree is spinous (*akanthodes*) except the stem; for it has spines on the branched shoots and leaves. It is of large stature, since lengths of timber for roofing of twelve cubits are cut from it. There are two kinds, the white and the black; the white is weak and easily decays, the black is stronger and less liable to decay: wherefore they use it in shipbuilding for the ribs. The tree is not very erect in growth. The fruit is in a pod, like that of leguminous plants, and the natives use it for tanning hides instead of gall. The flower is very beautiful in appearance, so that they make garlands of it, and it has medicinal properties, wherefore physicians gather it. Gum is also produced from it, which flows both when the tree is wounded and also of its own accord without any incision being made. When the tree is cut down, after the third year it immediately shoots up again; it is a common tree, and there is a great wood of it in the Thebaid . . ."

The plant referred to in the latter part of the quotation is apparently *A. nilotica*.

More than two centuries elapsed after the death of Theophrastus before a reference is again found to a plant that is alleged to be an *Acacia*. This reference is in *Georgics*, the work of Virgil (70-19 B.C.), the celebrated Roman poet. Elfriede Abbe in *The Plants of Virgil's Georgics* 129 (1965) translated *Georgics* 2: 118-119, namely, "quid tibi odorato referam sudantia ligno balsamaque et baccas semper frondentis acanthi", as follows:

"Why should I tell you of the balsam that sweats from the fragrant wood and the berries of the everleafy *Acacia*?"

Elfriede Abbe was of the opinion that the *Acacia* referred to in these lines is *A. nilotica*, and maintained that by "baccas" Virgil meant either the round heads of flowers or the moniliform pods which resemble a string of beads.

However, the above interpretation is at variance with some earlier opinions. Parkinson 1549 (1640) wrote:

"Some have thought that the *Acanthus baccifera* of Virgill, mentioned in the second of his *Georgickes*, in these words *Quid tibi odorato . . .*, should be this tree (*A. nilotica*), as *Servius Grammaticus*, and *Christoferus Landus* both of them commenters upon Virgill say; but without true judgement as *Guilandinus* noteth it, who would referre it to the *Acanthus Aegyptia* of *Athanaeus*; . . ."

According to Wood in Rees 1 (1802), Virgil had two different plants under this name (*Acanthus*). Wood continued:

"The *acanthus* with which he adorns the handles of Alcimedon's cups, in the 3d *Eclogue*, and places in the Corycian's garden, in the 4th *Georgic*, and the Egyptian *acanthus* of Theophrastus, are two very different plants. Virgil mentions another *acanthus* as being an ever-green plant, and producing berries, or a small round fruit; *baccas semper frondentis acanthi*, are his words; and Theophrastus tells us, that his Egyptian *acanthus* is a prickly tree, and bears pods like those of beans . . . It is plain, that the *acanthus* of Theophrastus is the acacia, a tree, from some species of which we have the gum arabic now in use: and the *acanthus* of Virgil, mentioned in the places above cited, is a garden herb, . . . The other *acanthus* mentioned by Virgil in the fourth *Eclogue*, and second *Georgic*, is the *acanthus* of Theophrastus."

Two important botanical works appeared during the 1st century A.D., namely, the Natural History of Pliny the Elder, and *De Materia Medica* of Dioscorides. The Natural History or *Historia Naturalis* of Pliny the Elder, Caius Plinius Secundus (A.D. 23–77), the distinguished Roman writer, is regarded as one of the most valuable relics of classical antiquity. The work is in effect a vast encyclopaedic compilation in Latin from the writings of Greek authors of the knowledge of his time and contains a large section devoted to plants.

Pliny made the following reference to *Acacia*:

"In the same country there groweth a thornie plant, which the inhabitants make great account of: and especially that which is in colour blacke, because it will abide the water, and never rot nor putrifie in it: and therefore excellent good for the ribs and sides of ships. As for the white thorn of this kind, it will soone corrupt and be rotten. But both the one and other, is full of prickles even to the very leaves. The seed lieth in certain cods or huskes, wherewith curriers use to dresse their leather instead of gals. The flower that this thorne beareth, is beautifull, whereof folke make faire guirlands and chaplets; profitable also besides and good for many medicines. Out of the barke of this tree there commeth a gum likewise. But the cheefeth commoditie and profite that it yeeldeth is this, cut it down when you please, it will be a big tree againe within three yeares. It groweth plentifully about Thebes in Aegypt, among Okes, Olives and Peach-trees, for the space of three hundred stadia from Nilus: where the whole tract is all woods and forrests, and nathelesse well watered with fountains and springs among." (Pliny the Elder, Natural History 13, 9; transl. Philemon Holland 1:390, 1601).

Rackham 4: 137 (1945) was of the opinion that the black-thorn is *A. nilotica* and suggested that the white-thorn may be *A. albidula*.

Philemon Holland 1: 391 continued with Chapter 11 of the 13th book of Pliny as follows:

"The best gum in all mens judgement is that which commeth of the Aegyptian thorne *Acacia*, having veines within of checkerworke, or trailed like wormes, of colour greenish, and cleare withall: without any peeces of barke intermingled among, and sticking to the teeth as a man cheweth it. A pound thereof is commonly sold at Rome for three deniers."

Chapter 12 of the 24th book of Pliny contains a lengthy discourse on gums and their varied uses.

De Materia Medica of Pedanios Dioscorides (1st century A.D.), the celebrated Greek physician and botanist from Anazarba in Asia Minor, is an encyclopaedic herbal in which are described the plants then reputed to have healing properties. It provided a valuable record of Greek herb-lore being based on his own observations and experience and on the writings of others including Crateuas, personal physician to King Mithridates (120–63 B.C.) (Stearn, 1954). As Pliny noted, Crateuas not only wrote about herbs; he also painted them in colour.

No contemporary version of the manuscript survived but the work has descended to us by the copying of copies of yet earlier copies. Consequently there exist manuscript versions of varying ages, completeness, accuracy and authenticity. Of these illustrated manuscripts of Dioscorides's work, the most important is the *Codex Aniciae Julianae* (also known as the *Codex Vindobonensis* and *Codex Constantinopolitanus*). This work was made at Constantinople about the year 512 A.D. as a gift for the lady Anicia Juliana, the daughter of Flavius Anicius Olybrius, Emperor of the West in the year 472. A number of the illustrations in the *Codex Aniciae Julianae* appear to be derived from those made by Crateuas about two thousand years ago.

In the facsimile edition of Dioscorides's *Codex Aniciae Julianae* published in Leiden in 1906 Book 1, Chapter 133 is translated as follows:

"Akakia. *Acacia* growes in Egypt. It is a Thorne, growing well neere to the bignesse of a tree, the fruit of it lying in cods as that of the Lupin."

After the work of Dioscorides there is little botanical history for about 1500 years. During this long period Dioscorides's herbal was venerated and uncritically accepted as the infallible authority. Then, in the sixteenth and seventeenth centuries, the correction and extension of Dioscorides's work became one of the main preoccupations of the many herbalists as a result of which numerous illustrated herbals were published.

THE PERIOD 1500–1754 A.D.

Among the first herbals to appear in which reference is made to *Acacia* or to plants referred to by this name was that of Otto Brunfels. The first edition of Brunfels's *Novi herbarii tomus II* was published by Johannes Schott in Strassbourg in 1531 and the following reference to *Acacia* and discussion on gum arabic appears on p. 9:

"ACACIA succus spinae crescentis in Aegypto. Resudat ex eo gummi quod Officinae gummi Arabicum, Celsus sine epitheto Gummi appellat. Vulgus Medicorum hodie ignorat quid sit *Acacia*, & pruna illa sylvestria quae in spinis proveniunt, pro vera *Acacia* interpretantur, gravi errore: cum ijs prorsus Dioscor, descriptio non respondeat. Sed de his alias."

According to Riddle, in *Dictionary of Scientific Biography* 4: 121 (1971), by 1544 approximately 35 editions of Dioscorides's translations and commentaries had been produced. The most illustrious edition was Pierandrea Mattioli's which was first published in Italian in Venice in 1544 under the title *Di Pedacio Dioscoride Anazarbeo libri cinque della historia & materia medicinale*. Reference to *A. nilotica* is found on p. 84, and the gradual improvement of this work occupied much of the remainder of Mattioli's life. It was translated into many languages and appeared in a long series of editions.

A Latin version entitled *Commentarii in sex libros Pedacii Dioscoridis* was published in Venice in 1554. Reference to *Acacia* appears on p. 113 and on p. 114 there is an illustration of "*Acacia altera*". However, the plant figured is not an *Acacia* but a member of Papilionaceae (tribe Genisteeae).

Reference is made to *Acacia* on p. 129 of the edition published in 1560 and on p. 51 of the 1562 edition of the work. Once again, the plant figured in these editions is not an *Acacia* but a member of Papilionaceae. The illustration from the latter edition is reproduced here as Fig. 1.

The same papilionate was illustrated under *Acacia* on p. 64 of Mattioli's *Kreüterbuch* published in 1563, but there is some discussion devoted to gum arabic.

In yet another edition entitled *I Discorsi nelli sei libri di Pedacio Dioscoride Anazarbo della materia medicinale* published in 1581 after Mattioli's death, reference to *Acacia* and illustrations of "*Acacia prima*" and "*Acacia seconda*" appear on p. 162. Neither species illustrated is an *Acacia*: both are papilionates. The figure of "*A. seconda*" is the same as that which appeared on p. 114 of the 1554 edition under the name "*Acacia altera*". Two papilionates are illustrated under the name *Acacia* on pages 210–211 of the 1585 edition.

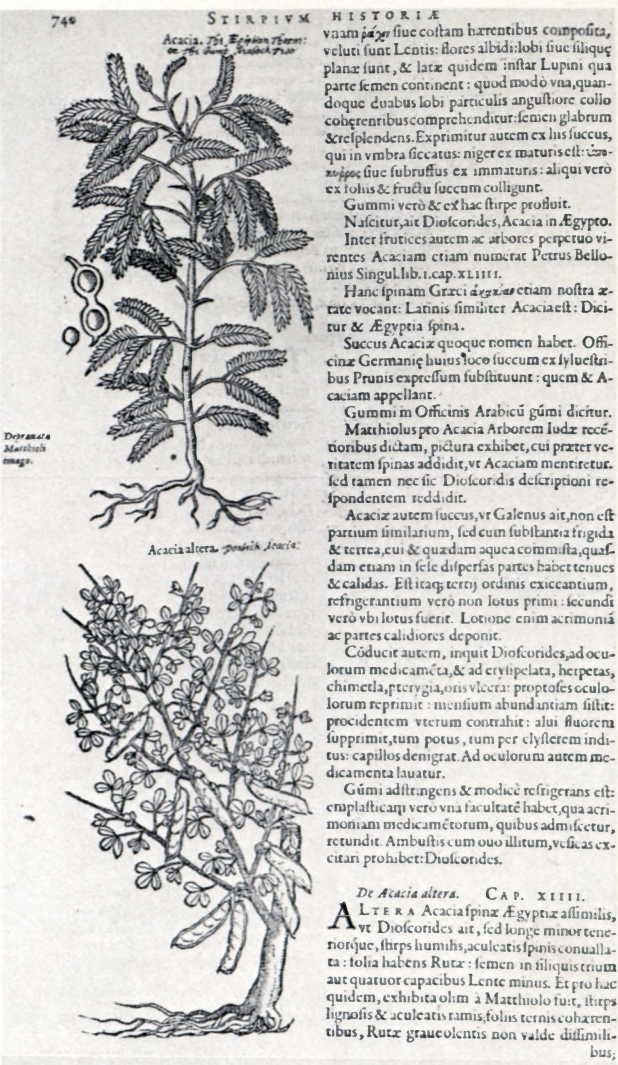


FIG. 3.—Illustrations of “Spina Acatiae . . .” (*A. nilotica*) and of “Acacia altera . . .” (a species of Papilionaceae) in de l’Obel, *Plantarum seu stirpium historia* 536 (1576).

FIG. 4.—Illustrations of *Acacia* (*A. nilotica*) and “Acacia altera” (a species of Papilionaceae) in Dodoens, *Stirpium historiae pemptades sex sive libri xxx* 740 (1583).

In the first edition of Dodoens’s *Stirpium historiae pemptades sex sive libri xxx* published by Christophe Plantin in Antwerp in 1583 reference to *Acacia* appears on pages 739–741. The first species is *A. nilotica*, the figure (reproduced here in Fig. 4) being identical to the figure which appeared on p. 536 of De l’Obel’s *Plantarum seu stirpium historia* (see Fig. 3), and the second species figured under the name “Acacia altera” is a papilionate. The latter figure is similar to the figure which appeared in De l’Obel’s work and was possibly based on it but is not identical. Dodoens, De l’Obel and Clusius permitted the use of their wood-blocks in each others work which explains the occurrence of the identical figure in the works of de l’Obel and Dodoens.

In the second edition of Dodoens’s *Stirpium historiae pemptades sex sive libri xxx* published by C. Plantin in Antwerp in 1616 *A. nilotica* is discussed and illustrated on p. 752.

In 1587 the *Historia generalis plantarum*, sometimes referred to as *Historia plantarum lugdunensis*, a book which formed a compendium of much of the botany of the late sixteenth century, was published in Lyon. Although no author’s name appears on the title page, the work is attributed to Jacques Daléchamps (Quinby

1: 165, 1958; Stafleu & Cowan 1: 591, 1976). A detailed discussion and a summary of the knowledge of plants referred to *Acacia* up until this time appear on pages 160–163. The three species illustrated, namely, *Acacia Aegyptiaca*, *Acacia Matthioli* and *Acacia Altera Matthioli*, are reproduced here as Figs 5 & 6. Of the three, only *Acacia Aegyptiaca* is an *Acacia*, probably *A. nilotica*. The figure of this species is curious in that some of the blank spaces have been decorated with insects and falling leaves. The figure of *Acacia Altera Matthioli* is likewise decorated with insects.

In 1592 Prospero Alpini published a treatise in Venice entitled *De plantis Aegypti* which was a pioneer study of the Egyptian flora. Alpini, a doctor, accompanied the Venetian Consul, Giorgio Emo, to Egypt where he took advantage of the opportunity to study the local flora (Arber, 1938). Alpini’s medical training led him to approach the new flora in the traditional manner of attempting to correlate the plants he encountered with the names and descriptions found in classical sources. However, when this was impossible, he described the plant under its local name and based the description upon specimens that he personally examined (Stannard in *Dictionary of Scientific Biography* 1: 124–125, 1970).



FIG. 5.—Illustrations of “Acacia Aegyptiaca” (probably *A. nilotica*) and “Acacia Matthioli” (a species of Papilionaceae) in Daléchamps, *Historia generalis plantarum* 161 (1587).

Alpini discussed *A. nilotica* on pp. 4–6 and his t. 4 is reproduced here as Fig. 7. Inflorescences and fruits of *A. nilotica* were depicted for the first time in this figure so it represents a significant advancement on previous attempts to illustrate the species.

Some of Alpini’s original descriptions were included in the writings of Linnaeus who regarded Alpini with sufficient esteem to name the genus *Alpinia* (Zingiberaceae) in his honour.

The year 1597 saw the publication by John Norton in London of the first edition of John Gerard’s *The Herball or Generall Historie of Plantes*. It appears (Arber 129, 1938; Quinby 1: 188, 1958) that Norton had commissioned a Dr Robert Priest to translate Dodoens’s *Stirpium historiae pemptades* sex, which was first published in 1583, but Dr Priest died before the work was published. His manuscript came into the possession of Gerard who altered Dodoens’s arrangement to that of De l’Obel, added some of his own comments, and published the work as his own. De l’Obel was requested by the printer to correct Gerard’s more obvious errors while the book was in the press, but Gerard’s impatience with the corrections prompted him to stop De l’Obel and insist on immediate publication.

In his discussion of the “Aegyptian Thorne” on p. 1149 Gerard stated: “Dioscorides hath made mention of two sorts of *Acacia*, this whose figure we

have set downe is the right *Acacia*”. However, the plant described and illustrated as “Acacia Dioscoridis, The Aegyptian Thorne” is in fact a papilionate and the same plant which was figured under the name “Acacia altera” in Dodoens’s *Pemptades* (1583).

The 1633 edition of Gerard’s *Herball* was enlarged and amended by Thomas Johnson who succeeded in correcting many of the errors in the 1597 publication. Two species are illustrated on p. 1330 of the 1633 edition. The illustration on the left “Acacia Dioscoridis, The Aegyptian Thorne” is of *A. nilotica*, the figure of the species being similar to that which appeared in Plantin’s edition of Dodoens’s *Stirpium historiae pemptades* in 1583. By changing the species illustrated under this name, Johnson succeeded in correcting the error made by Gerard. The illustration on the right “Acacia alteratrifolia Thorny Trefoile” is the same species of Papilionaceae as that figured by Gerard in 1597 but a different illustration was used.

Aldinus, *Exactissima descriptio rariorum plantarum Romae in Horto Farnesiano 2–7* (1625), provided, under the name *Acacia Indica Farnesiana*, a very detailed description and two illustrations of a plant in cultivation in the garden of Cardinal Farnese in Rome. The illustration on p. 2 (reproduced here as Fig. 8) shows the habit of the plant and the illustration

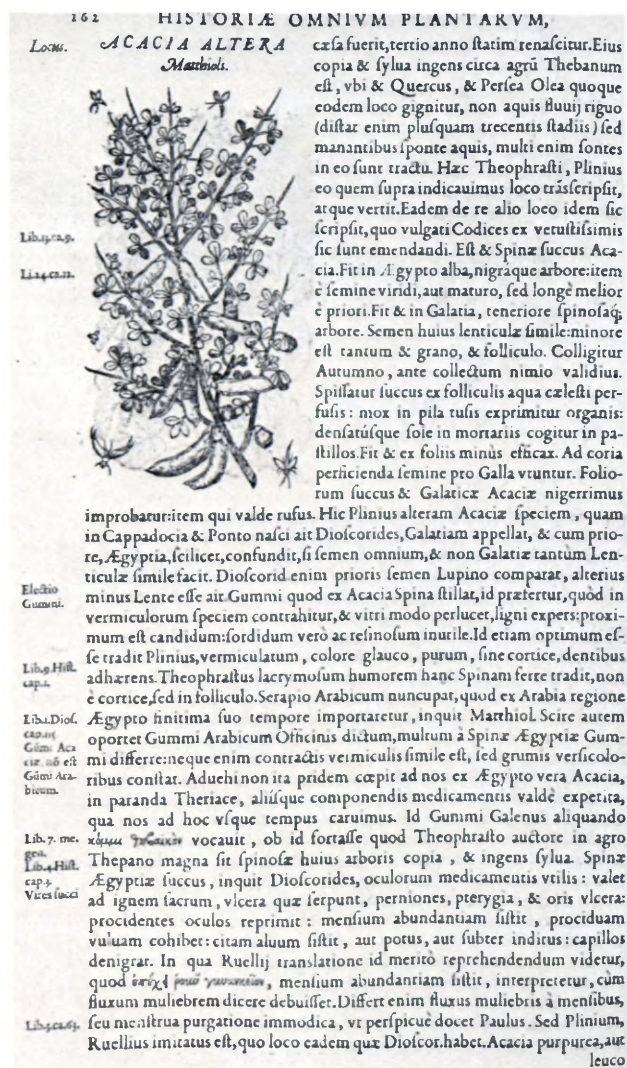


FIG. 6.—Illustration of “Acacia Altera Matthioli” (a species of Papilionaceae) in Daléchamps, *Historia generalis plantarum* 162 (1587).

DE PLANTIS AEGYPTI

ACATIA, SANT, ET KAKIA.



FIG. 7.—Illustration of "Acatia . . ." (*A. nilotica*) in Alpini, *De plantis Aegypti* t. 4 (1592).

on p. 4 (reproduced here as Fig. 9) is of a twig bearing flowers and fruits. Aldinus recorded that seeds of the plant were received from the island of St Domingo and were germinated in the year 1611. This appears to be the first direct reference to a species of *Acacia* indigenous to the western hemisphere or from an area other than the mediterranean or middle east.

The quality of the figure reproduced here as Fig. 9 greatly exceeded that of any previous illustration of an *Acacia* species, and of many which appeared in subsequent works. It is a faithful representation of the species now known as *Acacia farnesiana* and is of historical importance as reference to Aldinus's work is made by Linnaeus in the protologue of *Mimosa farnesiana* L. in his *Species Plantarum* ed. 1: 521 (1753), the basionym of *Acacia farnesiana* (L.) Willd., *Sp. Pl.* 4: 1083 (1806). Analysis of the protologue of *M. farnesiana* indicates that Linnaeus relied to some considerable extent on Aldinus's description and illustration of *Acacia Indica Farnesiana* for his concept of *M. farnesiana*, and that the epithet "farnesiana" was taken from Aldinus. In the absence of any specimen on which Linnaeus could have based his phrase-name of *M. farnesiana*, the

Aldinus plate reproduced here as Fig. 9 was selected as the lectotype of *A. farnesiana* (Ross, 1975b).

Aldinus discussed *A. aegyptiae* (*A. nilotica*) in detail on p. 7 of his work together with the characters that enabled the species to be distinguished from *Acacia Indica Farnesiana*.

It is perhaps as well to mention that there is some controversy over the authorship of the work here attributed to Aldinus. Pritzel, *Thesaurus Lit. Botanicae* ed. 2: 58 (1871), attributes the work to Castellus and notes "Operis "Exactissima descriptio" autor est Petrus Castellus, atque falso sibi vindicavit Aldinus; typographus enim hisce etiam verbis: "In gratiam Tobiae Aldini scripsi cuncta" profitetur, Aldinum auctorem non esse. Seguier". Aldinus was Cardinal Farnese's physician and so the work may well have been dedicated to him. Saccardo, *La botanica in Italia*: 12 (1895), credits Aldinus with the work. In the *Catalogue of the Library of the British Museum (Natural History)* 1: 26 (1903) the work is attributed to Aldinus but there is a note reading "By some this has been considered to be really the work of P. Castelli."

The first edition of Caspar Bauhin's *Pinax theatri botanici* was published in 1623 in Basle. In this work, which included all of the plants known to western botanists up until this time, he listed for each species known to him all of the names (i.e. synonyms) that



FIG. 8.—Illustration of the habit of "Acacia Indica Farnesiana" (*A. farnesiana*) in Aldinus, *Exactissima descriptio rariorum plantarum Romae in Horto Farnesiano* 2 (1625).

had been applied previously by earlier authors. Bauhin arranged the plants according to their natural affinities as he saw them and not merely in alphabetical order. A description of the genus *Acacia* appears on p. 391 and reference is made on p. 392 to two species, namely, "1. *Acacia foliis scorpioidis leguminosae . . .*" (i.e. *A. nilotica*), and "2. *Acacia trifolia . . .*" (i.e. a papilionate). Linnaeus drew heavily on Bauhin's Pinax and made constant reference to it in his *Species Plantarum*.

Volume 1 of Jean Bauhin's major botanical work, *Historia plantarum universalis*, was published in 1650 after his death under the co-authorship of J. H. Cherler and D. Chabrey (Stafleu & Cowan, 1976). A generic description of *Acacia* and a long dissertation appear on p. 426, and on p. 429 there is a description and illustration of *Acacia vera* (reproduced here as Fig. 10). The upper figure was clearly based on the illustration (t. 4) in Alpini's *De plantis Aegypti* (1592) which is reproduced here as Fig. 7. This upper figure featured by Bauhin was in turn reproduced in Duplain's *Historie des plantes de l'Europe 2: 715* (1737) under the name *Acacia Aegyptica*.

The year 1635 saw the publication in Paris of J.-P. Cornut's *Canadensium plantarum, aliarumque nondum editarum historia* which contains an early record of about 30 north-east American plants. The



FIG. 9.—Illustration of "Acacia Indica Farnesiana" (*A. farnesiana*) in Aldinus, *Exactissima descriptio rariorum plantarum Romae in Horto Farnesiano 4* (1625).



FIG. 10.—Illustration of *Acacia vera* (*A. nilotica*) in J. Bauhin, *Historia plantarum universalis 1: 429* (1650).

Acacia Americana Robini described on p. 171 and illustrated on p. 172 is *Robinia pseudo-acacia*.

John Parkinson's *Theatrum Botanicum* was published in London in 1640. Parkinson, who was honoured with the title of Herbalist to Charles I, took advantage of Bauhin's Pinax which enabled him to give the detailed nomenclature of each plant, and in this respect his work shows improvements on Gerard's Herbal. However, the rudimentary system of classification adopted by Parkinson was inferior to the system used by De l'Obel or Bauhin and serves to illustrate the lack of progress made in classification by the herbalists.

Parkinson's discussion of *Acacia* commenced on page 1547 as follows:

"*Dioscorides* hath made mention of two sorts of *Acacia*, the one of *Egypt*, and the other of *Cappadocia*, and *Pontus*: *Theophrastus* also speaketh of two sorts, blacke and white: that of *Egypt* is reasonable well knowne, but of that sort of *Pontus*, there is some controversie among Writers, some taking one bush to be it, and others denying it to be it, the differences of *Theophrastus* sorts are onely expressed in the wood, . . ."

Parkinson recognized and provided descriptions of three species. The first species enumerated was

"*Acacia sive Spina Aegyptia vera*. The true *Acacia*, that is Egyptian thorne or binding Beane tree" (i.e. *A. nilotica*), and the illustration which accompanied his description is reproduced here as Fig. 11. His description reads as follows:

"The *Egyptian Thorne* groweth in some places to be a great tree, and rather crooked then straight or rising high, covered with a blackish barke, spreading abroad great armes and branches, full of sharp thornes, with many winged leaves set on both sides of them, that is, with foure wings of leaves on a side, made of sundry small ones, set opposite on a middle rib, without any odde one at the end, although it be so expressed, *Bellonius* saith that he counted 350 of those small leaves, that were upon the whole branch, and yet all of them might but cover his thumbe: the flowers grow among the branches, like flockes of wooll, of a whitish yellow colour, where after come somewhat large and thicke huskes, like unto the *Lupine* or flat beane cods, blacke when they are ripe, and bunched forth against the places where the seedes lye, in some three or foure, and in some more, each as bigge as a small wild Beane, round, and of a grayish or ash-colour, almost shining: the tree abideth alwayes with greene leaves thereon, and yeeldeth of it owne accord a white gumme in small curled peeces like great wormes, and greater round peeces if it be wounded."

The second species described was "*Acacia Americana Farnescena*. The West Indian *Acacia* or binding Beane tree" (i.e. *A. farnesiana*), and the illustration of it is reproduced here in Fig. 11. It is at once apparent that this figure of *A. farnesiana* was based on the figure first published by Aldinus (1625). The third species, namely, "*Acacia secunda sive altera Dioscoridis*, The true second *Acacia* of *Dioscorides*" is a papilionate.

Herbaria Nuovo by Castore Durante was first published in Rome in 1585. The work was translated and reprinted for many years and the reference to *Acacia* on p. 3 of the edition published in Venice in 1667 is reproduced here as Fig. 12. It will be noticed that the description of *Acacia* del Matthioli (which is a

papilionate and not an *Acacia*) is written in the form of a poem. *Acacia* D'Egitto is probably *A. nilotica*.

A good illustration of *A. farnesiana*, similar to the one originally published by Aldinus (1625), appeared under the name "*Acacia Americana*" in Plate 35 of Abraham Munting's *Waare Oeffening der Planten* (1672) and the plants referred to the genus *Acacia* were discussed on p. 32.

A discussion of *Acacia vera* (i.e. *A. nilotica*) appeared on p. 398 of F. Hoffmann's *Clavis Pharmaceutica Schroederiana* (1681), while reference was made on p. 399 to *Acacia Germanica* (i.e. *Prunus sylvestris*).

And now, for the first time, our attention turns to the southern hemisphere. During his stay at the Cape of Good Hope, the High Commissioner Hendrik Adriaan van Reede tot Drakenstein, Lord of Mydrecht, authorized the Commander, Simon van der Stel, to explore the Copper Mountains of Namaqualand (Reynolds, 1950). Van der Stel's expedition left on 25th August 1685 and reached the Copper Mountains some 300 miles to the north on 21st October. The expedition returned to the Cape on 26th January 1686 after exploring part of the coast. It may be assumed that the artist Hendrik Claudius was a member of Van der Stel's party and to him are attributed the seventy-one pages of coloured drawings including those of plants encountered during the expedition.

The official record of Van der Stel's expedition to Namaqualand was removed from the Dutch East India Company's Archives in 1691 or 1692, and all trace of the manuscript ('Dag Register') was lost until 1922 when it was identified by Professor G. Waterhouse in the Catalogue of the Fagel Collection acquired by Trinity College, Dublin in 1802. The first part of the manuscript consists of the Journal of



FIG. 11.—Illustrations of "*Acacia vera sive spina Aegyptiaca*" (*A. nilotica*) and "*Acacia Americana Farnesciana*" (*A. farnesiana*) in Parkinson, *Theatrum Botanicum* 1548 (1640).



FIG. 12.—Illustrations of "Acacia del Matthioli" (a species of Papilionaceae) and "Acacia D'Egitto" (possibly *A. nilotica*) in Durante, Herbaria Nuovo 3 (1667).



807. ACACIA GIRAFFAE Willd. (?)

FIG. 13.—Illustration of an "Acacia" of unknown identity attributed to Claudius (T.C.D. No. 807). (Reproduced from Waterhouse, Simon van der Stel's Journal of his Expedition to Namaqualand 1685-6).

the expedition, and the second part of the coloured drawings. In 1932 Waterhouse published a book on Van der Stel's expedition to Namaqualand which included half-tone reproductions of the Claudius drawings.

One of the plants illustrated on Van der Stel's expedition (TCD No. 807) is reproduced here as Fig. 13.

A translation of the notes accompanying the drawing TCD No. 807 (Waterhouse, 1932) reads as follows:

"This tree grows in such abundance in Namaqualand that almost all the forests are composed of it. On account of its multitude of hurtful thorns we call it Thorn Tree, whereas the natives call it *Choe*. It is moderately tall and large but crooked, and it has good, hard, useful wood. It is found only along rivers and brooks. Its flowers have a remarkably pleasant smell and they are followed by a pod containing a few flat seeds, the effects of which are so far unknown."

Along the route followed by the Van der Stel expedition Claudius would certainly have encountered the plant that is now known as *Acacia karroo* Hayne. The only other *Acacia* species armed with paired stipular spines and with flowers in round heads that he may possibly have encountered was *A. erioloba* E.

Mey. However, the illustration attributed to Claudius (Fig. 13) bears little actual resemblance to *A. karroo*, to *A. erioloba*, or to any other South African *Acacia* species. The leaves are shown to be consistently imparipinnately compound whereas in all of the indigenous South African *Acacia* species the leaves are always paripinnately compound, and the pods illustrated are at variance with those of *A. karroo* and of *A. erioloba*. Father Tachard, who visited the Cape in 1685, is quoted by Karsten 89 (1951), as having said of Claudius that "He draws and paints animals and plants to perfection." As Claudius was an artist of such high repute it seems odd that his illustration is inaccurate in several obvious and significant respects and bears so little actual resemblance to any of the *Acacia* species. That is, of course, if the painting was executed by Claudius and at present there is no reason to doubt that it was not.

The figure published by Plukenet in his *Phytographia* t. 123, fig. 2 (1692), and reproduced here as Fig. 14, is almost identical to the illustration executed by Claudius on the Namaqualand expedition. Plukenet's illustration differs chiefly in that it has been reversed from left to right, i.e. the leaves, inflorescences and pods are depicted facing in the other direction. In addition, Plukenet has added a loose inflorescence, a loose pod and two more loose

seeds. The Claudius drawings are known to have been copied and the copies copied and a set of drawings was presented to Henry Compton, the Right Reverend the Bishop of London from 1675–1713, while his lordship was attending a Congress in Amsterdam in 1691. Both Petiver and Plukenet had access to the drawings in Bishop Compton's possession. The close similarity between the Claudius and Plukenet illustrations suggests that Plukenet copied Claudius's drawing: no specimen on which Plukenet could have based the illustration has been located in the Sloane Herbarium in the British Museum (Natural History), although this does not, of course, provide proof that Plukenet copied the Claudius illustration. It does, however, strengthen the argument that Plukenet copied an illustration and not an actual specimen. *Aloe* and *Gladiolus* paintings prepared by Claudius are known to have been copied by Petiver and by Plukenet (Reynolds, 1950; Lewis et al., 1972) and it is therefore a reasonable assumption that the Plukenet figure reproduced here as Fig. 14 was also copied.

The identity of the plant depicted by Claudius (Fig. 13) and subsequently copied by Plukenet remains uncertain which is unfortunate because *Mimosa capensis* Burm.f., Prodr. Fl. Cap. 31 (sphalm. 27) (1768) was based on Plukenet t. 123, fig. 2. This inability to positively identify the plant depicted has led to the name *Mimosa capensis* being rejected as a name of uncertain application (Verdoorn, 1954; Ross, 1971, 1975a).

It is interesting and perhaps significant that the plant depicted by Plukenet in his *Phytographia* t. 123, fig. 1 (see Fig. 14) is *A. karroo*. The figure was based on a sterile twig of *A. karroo*, Herb. Sloane Vol. 99, fol. 3 in the British Museum (Natural History), and is a good representation of it.

Plukenet's *Phytographia* t. 123, fig. 1, was cited by Plukenet in his *Almagestum botanicum* 3 (1696) under



FIG. 14.—Illustrations of "Acacia Africana, spinis candicantibus horrida, . . ." as t. 123 fig. 1 (*A. karroo*) and "Acacia Africana, Abruae foliis, aculeata, . . ." as t. 123 fig. 2 (identity unknown) in Plukenet, *Phytographia* (1692).

Acacia vera, by Linnaeus, *Species Plantarum* 1: 521 (1753), in synonymy under *Mimosa scorpioides*, and by Burm.f., Prodr. Fl. Cap. 31 (1768), under the name *Mimosa nilotica*, but in each case it was an incorrect identification.

The first volume of John Ray's *Historia Plantarum*, which contains descriptions of all plants then known, was published in London in 1686. The natural system employed by Ray depended in part on the differences on the formation of the embryo, that is, plants were divided roughly into monocotyledons and dicotyledons. "Acacia vera J.B." is discussed in some detail on p. 976 and there is reference to gum arabic, and "Acacia Indica Farnesiana Aldini" is discussed on the following page.

Horti academici lugduno-batavi catalogus by Paul Hermann, the director of the Leiden Botanic Garden from 1679–1695, was published in Leiden in 1687. Hermann considered two of the species referred to *Acacia* by previous authors, namely *Acacia trifolia* and *Acacia Germanica vulgo*, to be sufficiently distinctive to exclude them from his concept of the genus, although he retained *Acacia Americana* (i.e. *Robinia pseudo-acacia*) in the genus *Acacia*.

Further reference to *Acacia* appears on page 36 of Jacob Breyne's *Prodromus fasciculi rariorum plantarum secundus*, which is in effect a catalogue of plants observed by the author in gardens in Holland, published in Danzig in 1689.

Leonard Plukenet's *Phytographia* was published in three parts in London in 1691–2 and species referred to *Acacia* are illustrated in plates 121–123. Plukenet's works are of importance for purposes of typification because Linnaeus frequently cited them in his *Species Plantarum*, making reference to Plukenet's illustrations which were usually based on specimens in the latter's herbarium (now part of the Sloane Herbarium in the British Museum). Many of the species described by Linnaeus were known to him only by Plukenet's figure and brief descriptive note.

The plants illustrated in figures 3–6 of Plate 121 of Plukenet's *Phytographia* were referred to *Acacia*. Linnaeus, *Sp. Pl.* 1: 521 (1753), based his *Mimosa horrida*, the basionym of *Acacia horrida* (L.) Willd., *Sp. Pl.* 4: 1082 (1806), on Plukenet's *Phytographia* t. 121, fig. 4 (1692). The descriptive phrase quoted by Linnaeus "Acacia maderaspatana, foliis parvis, aculeis e regione binis praegrandibus horrida, cortice cinereo" appeared at the foot of Plukenet's plate, and was repeated, without additional information, in Plukenet's *Almagestum botanicum* 3 (1696). Although Linnaeus never saw the actual specimen drawn, there is nothing in his diagnostic phrase that could not have been obtained from a study of Plukenet's figure. The specimen on which Plukenet's t. 121, fig. 4 was based, is preserved in the Sloane Herbarium Vol. 95, fol. 3 in the British Museum (Natural History). Plukenet's t. 121, fig. 5, was cited by Linnaeus, *Sp. Pl.* 1: 520 (1753), under *Mimosa cinerea* [i.e. *Dichrostachys cinerea* (L.) Wight & Arn.], but the identity of the other two plants referred to *Acacia* in t. 121 is uncertain.

Four species referred to *Acacia* were illustrated in t. 122 one of which, namely fig. 1, was cited by Linnaeus, *Sp. Pl.* 1: 520 (1753), under *Mimosa cornigera* [i.e. *Acacia cornigera* (L.) Willd., *Sp. Pl.* 4: 1080, 1806], and a further three in t. 123.

Reference has already been made to t. 123 fig. 1, the caption of which is as follows: "Acacia Africana,

spinis candicantibus horrida, subrotundis foliis, odoratissima." The sterile twig depicted is referable to the species now known as *Acacia karroo*. This figure was later cited by Plukenet in his *Almagestum botanicum* 3 (1696) under *Acacia vera* as follows:

"*Acacia vera*, s. *Spina Aegyptiaca*, subrotundis foliis, flore luteo, siliqua brevi pauciorib. isthmis glabris, & cortice nigricantibus, donata . . . hujus *Icon* exhibetur in *Phytogr. nostr. Tab. 123 fig. 1* sub titulo *Acaciae Africanae*, spinis candicantibus horridae, subrotundis foliis odoratissimae".

Reference has also been made to t. 123, fig. 2, which was apparently copied from a drawing prepared by the artist Claudius who accompanied Van der Stel on his expedition to Namaqualand in 1685 and represents a plant of unknown identity. Plukenet's caption to this figure "*Acacia Africana*, *Abruae* foliis, aculeata, spinis longissimis horrida. . . ." was repeated in his reference to the species in *Almagestum botanicum* 3.

Plukenet made reference in his *Almagestum botanicum* 3 (1696) under the name *Acacia altera vera* (i.e. *A. nilotica*) to the illustration of the species which appeared in his *Almagestum botanicum* as t. 251, fig. 1, in 1694 (reproduced here as Fig. 15). This figure was cited by Linnaeus, in *Hortus Cliffortianus* 209 (1738), under the name "*Mimosa spinis geminatis*, foliis duplicato-pinnatis" and later in the synonymy of *Mimosa senegal*, in *Sp. Pl.* 1: 521 (1753), which illustrates that to his earlier concept of a species armed with paired spines in *Hortus Cliffortianus* Linnaeus subsequently added in the *Species Plantarum* the diagnostic phrase name of a species armed with spines (actually prickles) in threes.



FIG. 16.—Illustration of "*Acacia similis, spinis corniformibus mexiocana*" (*A. cornigera*) in J. Commelin, *Horti medici amstelodamensis* 1 t. 107 (1697).

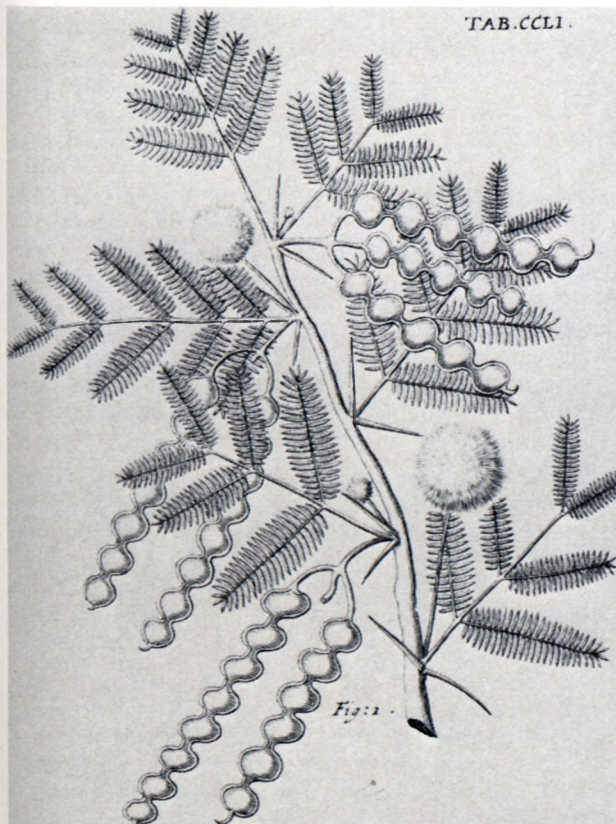


FIG. 15.—Illustration of "*Acacia altera vera*" (*A. nilotica*) in Plukenet *Almagestum botanicum* t. 251 fig. 1 (1694).

The year 1689 saw the publication of Jan Commelin's *Catalogus plantarum horti medici amstelodamensis* in Amsterdam. In this catalogue of the Amsterdam Physic Garden, of which Jan Commelin was Director, the plants are arranged alphabetically and on pages 3-4 four species of *Acacia* were listed. Of these, only the first two are referable to *Acacia*, namely, "*Acacia vera* J. Bauh. . . ." (i.e. *A. nilotica*) and "*Acacia indica Farnesiana* . . ." (i.e. *A. farnesiana*).

In 1697 volume 1 of Jan Commelin's *Horti medici amstelodamensis* was published posthumously by his nephew Caspar Commelin in Amsterdam. In this fine work figures 105-107 were devoted to *Acacia*, but of the three figures only the latter is readily identified as a species of *Acacia*. Figure 107, which is reproduced here as Fig. 16, depicts under the name "*Acacia similis, spinis corniformibus mexiocana*" one of the swollen-thorn *Acacia* species grown from seed collected in Cuba. As indicated by Blunt (137, 1955), the illustration of this *Acacia*, like many of the plants figured, rises stiffly from the soil and masquerades as a little tree. The figure in question was cited by Linnaeus under *Mimosa cornigera* in his *Species Plantarum* 1: 520 (1753). Commelin compared the plant with *Acacia Americana* Aldini (i.e. *A. farnesiana*) and discussed the reports of the small black ants associated with the swollen spines.

The three volumes of J.P. Tournefort's *Institutiones rei herbariae, editio altera* with fine copper engravings by Claude Aubriet, one of the classics of systematic botany, were published in 1700 in Paris, a work described as a second edition of his *Éléments de botanique* published in 1694. Tournefort adopted the concept of genera and species formulated by Caspar Bauhin but, unlike Bauhin, he placed the main emphasis on the genus. Whereas Bauhin gave only the name of the genus and supplied the species with descriptions, Tournefort consistently provided the genera with names and descriptions and added the species without providing special descriptions. Tournefort distinguished genera primarily on the characters of the corolla and fruit but he also accepted genera differing from allied genera by vegetative characters which he termed 'genera of second rank.' A generic description of *Acacia*, and of *Mimosa*, is given on p. 605 of Volume 1 together with an enumeration of species, and both genera are illustrated in t. 375 of Volume 3 of the work.

The two volumes comprising Hermann Boerhaave's *Index alter plantarum quae in horto academico Lugdano-Batavo* were published in Leiden in 1720. On p. 56 of the second volume the genus *Acacia* is attributed to Tournefort and twelve species are enumerated under the genus, some of which belong to other genera.

An alphabetical list of the plants in the Botanical Garden at Pisa is contained in *Catalogus plantarum horti Pisani* by Michele Angelo Tilli published in Florence in 1723. Several species of *Acacia* are discussed on p. 2 of the catalogue and illustrations appear in Plate 1.

The year 1737 saw the publication in Regensburg of the first volume of Johann Weinmann's *Phytanthoza Iconographia*. A generic description of *Acacia* appears on p. 8 and several species attributed to *Acacia* are enumerated, many of which belong to other genera. A hand-coloured illustration of *A. nilotica*, referred to as "*Acacia Aegyptiaca Vera*" is figured in t. 10.

Another work which appeared in 1737, in addition to the first edition of Linnaeus's *Genera Plantarum*, was *Thesaurus Zeylanicus* by Johannes Burman published in Amsterdam. Plants are arranged in alphabetical order in this work and the enumeration of species referred to *Acacia* appears on pp. 2-6. Burman used polynomials and the first species described on p. 2 under the name "*Acacia aculeata, multiflora, foliis pennas avium referentibus*" and illustrated in Table 1 (reproduced here as Fig. 17) is *Acacia pennata* (L.) Willd. Linnaeus cited this plate under *Mimosa pennata* in his *Sp. Pl.* 1: 522 (1753). The other *Acacia* illustrated in Table 2 under the name "*Acacia spinosa ex alis spicata, foliis pennas avium referentibus*" is *Dichrostachys cinerea* (L.) Wight & Arn. and the plate was cited by Linnaeus *l.c.*: 520 under *Mimosa cinerea*. Many of the other species referred to *Acacia* belong to other genera.

In an appendix to the *Thesaurus Zeylanicus* (1737), *Catalogi duo plantarum africanorum*, Burman listed a number of plants collected at the Cape by Hermann among which were three *Acacia* species. The second of these referred to as "*Acacia Africana, angustifolia, spinis majoribus, flore odoratissimo. Acacia Africana, spinis candicantibus horrida Plukn.*" is apparently *A. karroo*, but the identity of the other two is not clear from the descriptions.

In Adrian van Rooyen's *Florae Lugdensis Prodomus* published in Leiden in 1740, which comprises



FIG. 17.—Illustration of "*Acacia aculeata, multiflora, foliis pennas avium referentibus*" (*A. pennata*) in J. Burman, *Thesaurus Zeylanicus* t. 1 (1737).

a list of the plants in the Leiden Botanical Garden, the genus *Acacia*, along with the genus *Inga*, was treated as a synonym of *Mimosa* in keeping with the generic concept adopted by Linnaeus.

Linnaeus did not employ the name *Acacia* in a generic sense in the first edition of his *Genera Plantarum* published in 1737 (or in subsequent editions in 1742, 1743, 1752, 1754 or 1764), in *Hortus Cliffortianus* (1738), *Hortus Upsaliensis* (1748), in the first edition of *Species Plantarum* in 1753 or in the second edition of 1763. In these publications the genus was relegated to synonymy under *Mimosa*, and in the synonymy of *Mimosa* in *Genera Plantarum* Linnaeus attributed the genus *Acacia* to Tournefort. Linnaeus had a much broader generic concept than Tournefort and some of his successors being influenced primarily by characters of the androecium and gynoecium.

Linnaeus did use *Acacia* in a generic sense in his *Flora Zeylanica* 217 (1747) and his name has been associated with the genus from this publication. However, as this was prior to 1753, the starting point of modern botanical nomenclature, the genus *Acacia* L. has no standing in present nomenclature.

Philip Miller (*Gard. Dict. abridg. ed.* 4, 1754) was the first author to employ the name *Acacia* in a generic sense subsequent to 1753 and is, therefore, regarded as the author of *Acacia*. Philip Miller used the name *Acacia* in a generic sense from the first edition of his *Gardeners Dictionary* in 1731 to the seventh edition in 1759, and in the first to the fifth abridged editions published between 1735 and 1763. Miller's taxonomic knowledge was considerable and

he was slow to accept Linnaeus's views on nomenclature and classification. Although the first edition of Linnaeus's *Genera Plantarum* was published in 1737 and the first edition of *Species Plantarum* in 1753, Miller did not accept all of Linnaeus's generic and specific concepts uncritically, but retained as distinct many genera defined by Tournefort and suppressed by Linnaeus. It is largely on account of his departures from Linnaeus's concepts that Miller's works published subsequent to 1753 derive their nomenclatural importance (Stearn, 1969).

In the seventh edition of *The Gardeners Dictionary* (1759) Philip Miller adopted the phrase-names from Linnaeus's *Species Plantarum* wherever applicable and provided new ones where required for species not known to Linnaeus. Miller wrote under his treatment of the genus *Acacia* in the seventh edition:

"Dr. Linnaeus has joined the plants of this genus, and also the *Inga* of Plumier, to the *Mimosa*, or sensitive plant, whereby he has multiplied the number of the species greatly, and occasioned some confusion. I shall choose, therefore, to refer them to their former genera again; for as all sorts of *Mimosa* have articulated pods, and their leaves move on being touched, so the *Acacias*, which have neither of these properties, may very reasonably be made a distinct genus, and hereby the ancient official name will be preserved."

He then proceeded to enumerate the characters of the genus *Acacia*.

It was not until the eighth edition of *The Gardeners Dictionary* in 1768 that Miller finally accepted Linnaeus's binomial nomenclature for species. In his preface of this edition he stated:

"In the last edition of this work, the author adopted in a great measure the system of Linnaeus, which was the prevailing method of ranging plants then in use among botanists; but as many of the plants which were treated in the *Gardeners Dictionary*, were not to be found in any of Linnaeus's works then published, Tournefort's system was also applied to take in such as were not fully known to Dr Linnaeus; but since that time the learned professor having made great additions to his works, and those additions being generally consulted for the names of plants, the author has now applied Linnaeus's method entirely, except in such particulars, where the Doctor not having had an opportunity of seeing the plants growing, they are ranged by him in wrong classes, . . ."

Thus Miller belatedly converted to Linnaeus's system in the eighth edition of his *Dictionary* and relegated *Acacia* to synonymy under *Mimosa* where he noted:

"The *Acacias* are so nearly allied to the *Mimosas* in their characters, that Linnaeus has joined them in the same genus; and as his system is now generally followed, so in compliance with that I have done the same."

Subsequent authors did not follow Linnaeus's broad generic concept and treated *Acacia* and *Mimosa* as distinct genera, although the limits of the genera remained ill-defined for a long time. The generic limits of *Acacia* were finally clarified by Bentham (1842) and have not been seriously in doubt since.

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UITTREKSEL

Die voor-Linnaeiese geskiedenis van die plante toegewys aan die genus Acacia weerspieël in 'n sekere mate die ontwikkeling van botaniese beskrywing, klassifikasie en illustrasie. Aandag word gevestig op sommige van die vroegste verwysings na plante bekend as behorende tot die genus Acacia en op verwysings in uitgekose kruidboeke en publikasies tot met Philip Miller se beskrywing van die genus in die vierde verkorte uitgawe van sy Gardeners Dictionary in 1754.

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