



*Cavanilles' detailed illustrations established the dahlia in the botanical taxonomy*

In 1796, the third volume of "Icones" introduced two more dahlia species, named *D. coccinea* and *D. rosea*. They also were initially thought to be sunflowers and had been brought to Spain as part of the Alejandro Malaspina/Luis Neé expedition. More than 600 drawings brought the plant collection to light. Cavanilles, whose extensive correspondence included many of Europe's leading botanists, began to develop a following far greater than his title of "sacerdote" (priest, in French Abbé) ever would have offered. The A. J. Cavanilles archives of the present-day Royal Botanical Garden hold the botanist's sizable oeuvre, along with more than 1,300 letters, many dissertations, studies, and drawings. In time, Cavanilles achieved another goal: in 1801, he was finally appointed professor and director of the garden. Regrettably, he died in Madrid on May 10, 1804. The *Cavanillesia*, a tree from Central America, was later named for this famous Spanish scientist.

## ANDERS DAHL

The lives of Dahl and his Spanish 'godfather' could not have been any more different. Born March 17, 1751, in Varnhem town (Västergötland), this Swedish botanist struggled with health and financial hardship throughout his short life. While attending school in Skara, he and several teenage friends with scientific bent founded the "Swedish Topographic Society of Skara" and sought to catalogue the natural world of their community. With his preacher father's support, the young Dahl enrolled on April 3, 1770, at Uppsala University in medicine, and he soon became one of Carl Linnaeus' students. Not for long: Anders was forced to drop out of the university the following year due to his father's death, which plunged the Dahl family into financial crisis.

Several years later (in 1775) Dahl started work on an entomological dissertation, and the 25-year old passed his preliminary medicinal exams on May 1, 1776. Thanks to the intervention of Linnaeus, Dahl gained employment as curator with a wealthy benefactor, Claes Alströmer, who had founded a natural collection and botanical garden at his estate Kristinedal outside Gothenburg. In 1778, the elder Linnaeus died and was succeeded by his son at the university. Dahl never was Linnaeus' secretary as has been claimed, and he certainly was not one of the classification giant's favorite pupils. That honor belonged to Linné's Apostles, among them Daniel Solander, Pehr Kalm, and particularly Carl Peter Thunberg. In fact, the Linnean Society of London (where the Linnean collection now resides) makes only passing mention of Dahl in its biographical works. Regrettably, no illustration of a reportedly wildly hirsute Dahl has been unearthed to date.

Nevertheless, Anders Dahl figures as a Swedish naturalist with a keen interest in his environment: In 1784, he wrote a treatise in Stockholm's "*Trangrums-acten*", analyzing the effects of pollution caused by smelly wastes from herring oil rendering plants. This resulted in legislation restricting the release of industrial waste into the groundwater, a first for Sweden (and perhaps for the world). Dahl also was involved in attempting to negotiate with others in order to keep the Linnean collection from being sold abroad. After several potential Swedish buyers had been approached with little success, the frantic 'apostles' thought that Dahl's employer could purchase the valuable artifacts. Eventually though, money talked, and a wealthy Englishman (James Edward Smith) took the treasures back to London - all the while threatened by suddenly awakened Swedish pride and a pursuing Swedish navy.

The following year, it was Claes Alströmer's turn to face a financial reversal. Nearly bankrupt, he retreated to another estate, Gåsevadsholm, taking Dahl with him. During that time the 34-year old helped an old classmate, Adam Afzelius, who was working on a new edition of Linnaeus' "*Flora Svecica*". Anders Dahl also befriended another Uppsala professor, the newly minted rector Carl Peter Thunberg. Unlike this globetrotting botanist, Dahl had been able to take only affordable forays into the Swedish countryside. However, in 1786 he traveled to Denmark where he received an honorary doctorate in medicine from the University of Kiel. He also began work on his most important text, "*Observationes botanicae circa system vegetabilium divi à Linné*" -(Botanical Observations Concerning the Linnean Plant Systemology).

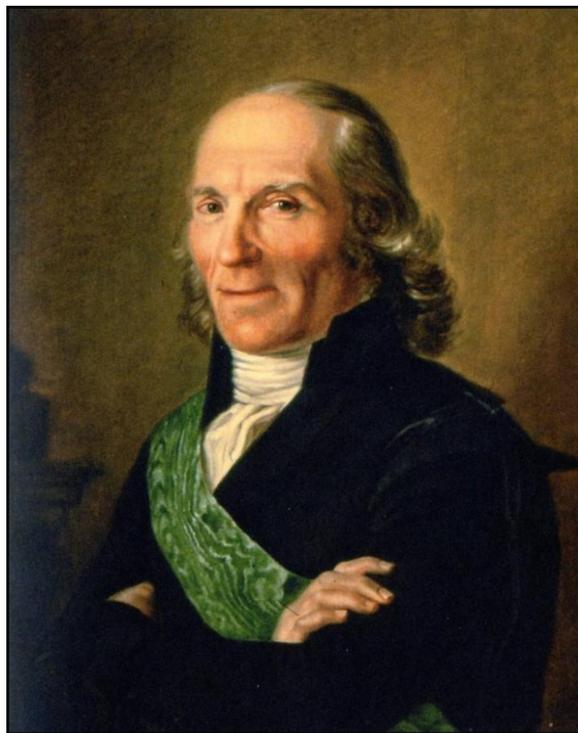
The loss of his benefactor forced Anders Dahl to take up another position: in 1787 he accepted a post as associate professor of medicine and botanical demonstrator at the University of Åbo (now Turku, Finland). While there, he completed the book and continued cataloguing his herbarium, consisting mostly of duplicates from the Linnaean and Alströmer collections. (Most of this, and much of Dahl's writings, was lost during a great fire in 1827. Others are kept at Uppsala University). On May 25, 1789 - more than a year before Cavanilles saw the first dahlia in bloom in Madrid - Anders Dahl died at the age of 38 of *slemfeber* (phlegmatic fever or pneumonia).

## CARL PETER THUNBERG

A dashing nobleman, Thunberg cut quite a different figure from the unkempt Dahl. A native of Linnaeus' home province of Småland, Carl Peter Thunberg (born in 1743) also suffered from his father's early death in 1751. Studying first in his hometown Jönköping - and then after 1761 at the Uppsala University - Thunberg quickly achieved what had taken Dahl most of his life. In 1768, he studied medicine and two years later received his licentiate that then led to a doctorate in medicine. He was one of Linnaeus' most illustrious scholars and much preferred botany to his field of study.

On the recommendation of his mentor, Thunberg accepted a scholarship for travel abroad. He first traveled to Holland and then to France, where he studied and mingled with natural scientists in Paris. He was not to return to Sweden for the next nine years. Invited to sail as ship's physician aboard a Dutch merchant vessel to Japan, he eagerly accepted. At that time, Japan was still a hermetically self-isolated empire, and its flora had barely been explored. In the intervening years, Thunberg traveled to South Africa, to Indonesia, and ultimately was able to stay a year in Japan. In 1778 he returned to Amsterdam via a circuitous route, continuing plant collection and identification. After a side trip to London, he took up a lectureship at his alma mater, Uppsala University.

Only Carl Linnaeus junior stood between Thunberg and the chair of botany he coveted. Meanwhile, the renown of the globetrotting botanist grew with every book and article he wrote. Carl Peter Thunberg was a prodigious writer and corresponded regularly with scientists he had become acquainted with on his journeys. He also cultivated a corps of students and befriended Swedish scientists, among them Anders Dahl. When in 1783 the younger Linnaeus died unexpectedly, Thunberg soon assumed the chairmanship and later became rector of the university. He also found time to marry at long last at 41 years of age. Interestingly (and a cautionary note to globetrotting spouses) Thunberg never left Sweden after that.



Carl Peter Thunberg

Largely due to his correspondence, Cavanilles learned about science in Sweden. And perhaps for that reason alone (plus the fact that Dahl's book on botanical observations had just appeared) the Spaniard selected one of the newly classified Mexican plants and named it thus: "*In honorem D. Andreae Dahl, sueci botanici*". Sure, Thunberg also sought to honor the memory of Dahl by naming a Japanese member of the Hamamelidaceae (witch hazel) family *Dahlia crinita*, no doubt a sly allusion to the similarity between its fuzzy flower and Dahl's appearance. However, since the work this appellation appeared in was not published until 1792, Cavanilles' ascription took precedence. If one more piece of evidence can be offered to counter the claim that Cavanilles and Dahl raised dahlias together, consider this: in the Cavanilles Archives there are 24 letters from Thunberg. There is not one from Dahl.

## THE FRENCH CONNECTION

In the Year X of the French Republic (1802) a physician, Citizen Thibaud, visited the venerated professor André Thouin at the *Jardin des Plantes* near Versailles. Having just returned from Madrid, Dr. Thibaud delivered packets of starter plants, seeds, and dahlia roots obtained from that capital's Royal Botanical Garden. For years, Thouin had maintained a lively exchange of correspondence and plant material with a former colleague, Antonio José Cavanilles (now the Garden's director). As Thouin recalled in his 1804 treatise, *Memoire sur la Culture des Dahlias et sur leur Usage dans l'Ornement des Jardin* ("Notes on Dahlia Culture and on their Use in Garden Decoration"), the dahlia tubers belonged to three species that Cavanilles had been raising in Madrid. The article also contained color illustrations of these species.

### THE ACADEMICS

Thus begins the first chapter of significant dahlia culture and hybridization in Europe. For more than ten years, these species dahlias had grown among the other plant collections brought from New Spain. Cavanilles apparently allowed them to winter over outdoors or relied on vegetative reproduction to multiply the plants. As fecund as we now know dahlias to be, apparently no effort was made to raise new varieties from seed. Once in Paris, that would quickly change.

André Thouin (1747-1824) was a gardener with an unbridled thirst for knowledge. Already in 1764, at the age of seventeen, he succeeded his father as head gardener of the *Jardin du Roi* (during the Revolution renamed *Jardin des Plantes*). He began enlarging its eclectic holdings considerably with botanical material suitable for display and research. A star pupil of the famous scientist Bernard de Jussieu, soon he also became a member of the French Academy of Sciences and the *Institut de France*. Jussieu's brother Antoine had attracted much attention in that he challenged the rigid Linnean system of taxonomy, which depended on classifying plants by counting arrangements of reproductive parts. Antoine de Jussieu published his seminal work on systematics in 1789; it arranged plants according to their natural relationships, not merely on the basis of sexual characteristics. A Swiss botanist, Augustin-Pyramus de Candolle, worked with Jussieu in modifying such classification. Bernard and André Thouin sought to verify these hypotheses just as the *Ancien Régime* was falling apart.

Appointed *professeur de cultivation* in 1793, Thouin began work at the prestigious Museum of Natural History and soon rose to its directorship. The turmoil of the revolutionary period caused much damage to plant collections. However, it also allowed Thouin to enrich the museum (and its now-attached *Jardin des Plantes*) with plant materials, herbaria, and books looted or confiscated from the estates of nobles and the bourgeoisie. This garden sanctuary ultimately became the only French scientific institution saved from the ravages of the French Revolution.

His contemporaries, men of science such as Etienne Saint-Hilaire, René Desfontaines, and the famous Jean-Baptiste Lamarck, regularly consulted with academicians abroad, assisted by a Napoleonic urge to spread France's glory to other parts of Europe. As Thouin began organizing the scientific collection of the museum, he also began distributing plants to newly-established botanical gardens throughout France. With a new central administration in place, each district (*département*) was required to maintain a garden center for educational and economic purposes. The kitchen garden (potager) was meant to provide a scientific approach to feeding the masses. Flowers were for edification of the leisure class, it was said. In time, though, revolutionary fervor settled down to enjoy even a bouquet or two between Napoleon's military campaigns. The dahlia roots were started in large pots and tended in Thouin's greenhouse. Later that summer, the plants began to flower with



André Thouin



Paris—Jardin des Plantes with Lamarck statue

the prettiest species sporting violet purple blooms. Thouin named this late bloomer *Dahlia pourpre* (it was probably *D. pinata*, judging from the illustration). In his article, he also noted that he failed to protect the plants from frost and surmised that the native species must have come from hot parts of Mexico, since they proved to be so cold-sensitive: “Ce qui prouve ou au moins donne de très fortes presumptions pour croire que ces plantes n’habitent pas les regions froides du Mexico, mais les parties chaudes . . .” There was much to learn.

## **THE EMPRESS**

The waning of mob rule as the Republic developed structure under the increasing influence of Napoleon Bonaparte also led to a resurgence of decidedly aristocratic traditions. Marie Josèphe Rose Tascher de la Pagerie was a young and exotic conquest that the young general set his sights on. A native of Martinique, the girl accompanied her mother on a visit to Paris; she never returned to her Caribbean paradise. Instead - barely sixteen - Joséphine married a nobleman, Alexandre de Beauharnais. She bore him two children and enjoyed her domesticity, but in the turmoil of the Revolution, she and her aristocratic family parted company. By now a beautiful woman of great bearing, she soon moved into Napoleon’s influential circles. He immediately was smitten with her, and on March 9, 1796, married Joséphine, boldly ignoring her previous marital state. As Napoleon noted with satisfaction: “I win battles; Joséphine wins hearts.”

Always interested in gardening, Joséphine now had the resources to indulge in her passions. Against her husband’s wishes (in 1799) she purchased a run-down estate about ten miles west of Paris called Malmaison. The property included a chateau in need of repair, some vineyards, and a small park. With the assistance of two esteemed architects, she had the building restored. She then began spending huge sums on landscaping and acquiring a botanical collection for the estate. The remodeling project initially did not please Napoleon. He was used to formal gardens like Versailles, and Joséphine had embraced something quite different altogether: “Madame Bonaparte will have nothing but the English style”. In time, though, he came around and began enjoying its charms. (A famous sketch shows the First Consul/President standing in front of the residence). Malmaison was France’s seat of government between 1800 and 1802.

Joséphine cultivated relationships with amateur botanists such as Etienne Pierre Ventenat (who headed the garden until his death in 1808) and with famed botanical painter Pierre Joseph Redouté. Ventenat soon produced a work, entitled *Le Jardin de la Malmaison*, with 120 illustrations by Redouté. André Thouin, along with other notable scientists, provided advice and plant material to this new patron. While it can be assumed that dahlia roots were part of these acquisitions, none of Redouté’s fine color stipple illustrations featured this new arrival. (Indeed, only very late in life did he offer an illustration of a dahlia - a double one at that).

The following year, in 1804, Joséphine was crowned Empress of France by a Napoleon eager to resume royal traditions. As Napoleon set off on military campaigns to consolidate his empire, Joséphine followed her passion for compiling a huge botanical collection. She particularly loved roses: more than 250 varieties were raised at Malmaison. Redouté’s most famous work *Les Roses* depended on this collection. Another series of detailed floral paintings became *Les Liliacées* (“The Lilies”). The empress was single-handedly responsible for introducing many exotic plants to Europe. Even while France and England were at war, Joséphine continued trading with Lewis Kennedy of London’s Vineland Nursery, who traveled by special passport. Malmaison’s final design included a river, waterfalls, and a lake, along with 70 acres (of 426 total) given over to her bulging botanical collection.



*Napoleon, Joséphine and her courtiers enjoying Malmaison*

In 1808, the grounds were finally completed. With the death of Ventenat that year, Count Lelieur de Ville-sur-Arce became garden director of Malmaison. During his brief tenure, Lelieur took up the task of hybridizing dahlias. He soon became embroiled in a battle of wills with Joséphine’s new favorite botanist, Aimé Bonpland, who had returned from his American expeditions with Alexander v. Humboldt in 1804 to assist the empress. The explorers also had brought new dahlia seed material from Mexico, and it is assumed that the new varieties that appeared in Paris were either unknown species or already hybrids. They certainly did not match what Cavanilles had described and illustrated in his *Icones*.

Several months into his appointment, a truculent Count Lelieur was given his walking papers and sent to St. Cloud to head up that large garden. There he raised dahlia seedlings, according to his *Memoire sur Malmaison*. They came in a number of colors, including white, and some were even semi-double. Lelieur became famous as a developer of roses (the *Rose du Roi* originally was named for the count) and as pomologist but oddly never as a dahlia hybridizer.

The following year, it was Joséphine's turn to fall from grace. Unable to bear an heir to the throne, she was curtly informed on December 15, 1809 that her marriage to Napoleon was dissolved and that she was to become the Duchess of Navarre in far-off Normandy. Humiliated, she insisted on staying at Malmaison with Redouté and Bonpland among her retinue. Meanwhile, Napoleon negotiated a political marriage with the Austrian emperor's daughter, the Archduchess Marie-Louise, who promptly bore him a son. Regal but heart-broken, Joséphine died at Malmaison in 1814.

### **THE PLANT COLLECTOR**

No one was more affected by Joséphine's sudden demise than her garden director, Bonpland. Born Aimé Jacques Alexandre Goujaud in 1773, his love of plants soon gave him a nickname ('*bonne plante*') that he preferred over his given name. His surgical training and avid interest in botany placed him in a perfect position when the polymath and explorer Alexander v. Humboldt arrived in Paris in 1798 on his way to the New World. With the cooperation of the Spanish government, the expedition took von Humboldt and Bonpland to the Caribbean, South and Central America,



*Aimé Bonpland*

and even to Thomas Jefferson's home Monticello. They returned via a circuitous route to Paris in 1804, having collected and catalogued more than 4,500 varieties of plants, along with many other cultural and geological artifacts. All of Paris was agog, and the Empress was ecstatic over the plant collectors' descriptions of the strange lands beyond her beloved Martinique. Napoleon was not quite as thrilled: "M. de Humboldt . . . I understand you are interested in botany. My wife also studies it," he said coldly. The explorers related that they had met Vicente Cervantes in Mexico City and climbed hills in the neighborhood of Patzcuaro, where (among other plant material) they collected dahlia seeds. Cervantes already was acquainted with the flower, they recalled.

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Joséphine and Bonpland became fast friends, and on her insistence, Bonpland was hired as staff botanist at Malmaison. He had full reign of the plant collection with unlimited resources - at least until the Empress was deposed. Bonpland threw himself into gardening and hybridizing, but in doing so, his record-keeping suffered. If any dahlias were grown specifically for display purposes, there is no mention in accessible literature nor in his compendium *Description des Plantes Rares Cultivées à Malmaison et à Navarre*, published between 1812 and 1817 (with Redouté's lovely contribu-

### **THE BREEDERS**

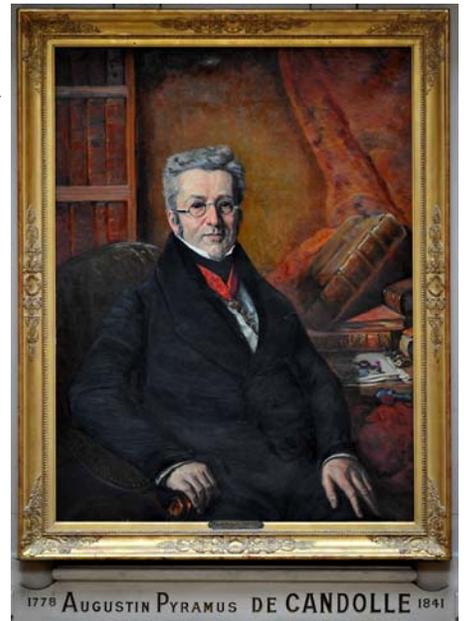
tions). When Joséphine died, Bonpland turned his back on Europe and returned in 1816 to Argentina. An Innocent Abroad, he spent the rest of his short life there in poverty or in prison.

Instead, it was left to the likes of Count Lelieur at St. Cloud, and to Augustin-Pyramus de Candolle, who was the director of the botanical garden at Montpellier, to catalog arriving species dahlias and engage in well-documented hybridization. In 1817, Lelieur succeeded in raising his first fully double dahlia. He also recorded growing variegated forms and, according to Joseph Sabine's account in 1818, the garden displayed dahlias in shades of purples, dark and cherry reds, buffs, and even pale yellows. However, the count was also absorbed with agricultural projects and his contributions to dahlia culture have not been properly recognized. Some dahlia texts credit Count Lelieur with having tried to make dahlia tubers a new food source; evidence linking him with such efforts is still lacking.



*Redouté's rendering of a single dahlia*

De Candolle, on the other hand, took an abiding interest in propagating and promoting the dahlia throughout his life. Presumably, he received dahlia roots from Cavanilles as well, because by the time Humboldt returned to Paris in 1804, dahlias were already growing and blooming at Montpellier. The profusion of species aberrations (such as different ray colors in what should be *D. pinnata*) caused no end of grief to the taxonomists. Multiple names for identically-appearing blooms were common and they would appear in commercial catalogs until well into the late 1800s. Once hybridization efforts yielded a profusion of new colors and forms, it became a real challenge to link these to arriving species. For example, he had no fewer than five *D. pinnata* varieties! De Candolle consolidated what was known about dahlias in his 1810 treatise *Note sur les Georgina*. Why *Georgina*? Ah, that's another story.



## GEORGINA ON MY MIND

It is perfectly understandable, given the dahlia's popularity in our gardens today, to assume that the flower began its conquest of the Old World soon after its arrival in Spain. However, more than ten years elapsed before a handful of scientists and court gardeners even had the opportunity to grow Cavanilles' three varieties. The dahlia was just one of a trove of plant treasures collected in the Americas - and not an impressive one at that! That would soon change: 200 years ago an extraordinary event shaped the development of the dahlia, setting off dahlia lovers on a quest to explore immense and uncharted genetic regions. They have not come close to finding the edge of that world.

### VON HUMBOLDT'S CONTRIBUTION

The event that spurred this exploration was the return of Alexander von Humboldt (accompanied by his friend and assistant Aimé Bonpland) to Paris in August 1804. Their five-year long search, financed by the prosperous German nobleman from a sizable inheritance, led them to the jungles of South America. It also allowed the young scientists to collect more than 6,000 plant specimens. The humidity of the tropics destroyed probably that many or more. One of the side trips of the expedition led to Mexico in April 1803. On the advice of Vicente Cervantes, the pair also explored these new surroundings. Von Humboldt recollected some decades later:

*"As I descended from the high plains of Mexico toward the coastal regions of the South Sea we came upon a meadow clearing - in tropical areas a very rare sight. There (at an elevation of 6,000-6,800 feet) and east of the volcano Jorullo near Pazcuaro, we found flowering and seed-bearing georginas. Their height was only five or six inches. This happened in 1803. After our return to Mexico City we learned that the plant was already known to Mr. Vicente Cervantes. He already had sent seeds to the famous botanist Cavanilles in Madrid."*

The vast collection of materials, artifacts and ethnographic documentation arriving with v. Humboldt's entourage took decades to record and analyze. The dashing nobleman, however, was an instant sensation in Paris, much to the chagrin of a newly crowned emperor. Openly disliked by Napoleon, but lionized by the social set and respected by Europe's leading academics, von Humboldt spent the next several years (along with the rest of his fortune) mostly in the City of Light. He was able to secure employment for his companion Bonpland at Malmaison, but found the amiable fellow to be an unmotivated researcher. The hoped-for cooperative effort to produce the comprehensive record of their travels had to be postponed repeatedly. Ultimately, another German botanist (Karl Kunth) took over the exhaustive publication of the 6-volume botanical work, finishing it in 1830. In the interim, v. Humboldt returned to his native Berlin to take up a political and academic career in the Prussian government that would earn him the title of Germany's greatest man of science.



*Humboldt and Bonpland on their American expedition*

Eager to share the wealth of his travels, Humboldt sent descriptions and plant material (including seeds or roots) to major universities and botanical collections, with whose staff he was well-acquainted. As he later noted, they went “*dans les jardins de Paris, dans tout l’Allemagne et le Nord.*” Since dahlias already had been received from Madrid by several French raisers, what possible contribution could von Humboldt offer to the dahlia world? Well, bear with me.

Most of the plant collection was turned over to the Museum of Natural History in Paris where it is still held in a special herbarium. Other materials, usually duplicates, were sent on to Berlin. The Royal Prussian Herbarium (now Botanical Museum Berlin-Dahlem) inherited the priceless specimens (at least 3,300 at last count) as a result of a long-term relationship of von Humboldt with his botanist mentor, the venerated Professor Willdenow. Unfortunately, most of the specimens and documentary materials were destroyed during World War II.

### **WILLDENOW’S CONUNDRUM**

The preeminence of French scientists was challenged in the 1800s by scholars centered in the major German capitals and universities. Carl Ludwig Willdenow was born in 1765 in Berlin, apprenticed in his father’s pharmacy and then studied medicine. While still a student, he developed a strong bent for botany, publishing his first work in 1787. A year later he became acquainted with v. Humboldt. The 23-year old Willdenow struck up a lifetime friendship with his teenage pupil. As the Humboldt expedition took shape, Willdenow would regularly exchange mail with Alexander on the long journey. Meanwhile, he had taken up residence as a physician, become revered as a professor for natural science, and (in 1801) accepted the post of director of the Berlin Botanical Garden.

He received dahlia roots from Cavanilles in 1803 (the same time as de Candolle). Willdenow had been working on a revision of Linnaeus’ seminal treatise *Species Plantarum, Vol 3*. As the dahlia had initially been grouped under the Linnean class of Syngenesia, order Superflua, a review of its current classification was prompted by the botanist’s aim to redefine the taxonomy. He learned that another plant, a South African member of the witch hazel family, had been named *Dahlia crinita* by Thunberg in 1792. According to his recollections, its flowers’ woolly appearance (so typical of witch hazels) reminded Thunberg of Anders Dahl’s shock of hair.

In accord with scientific convention, the date of publication determines the right to claim a given plant name. Thunberg apparently was unaware that Cavanilles had published a description of *D. pinnata* in his first *Icones* in 1791. This gave Cavanilles precedence; not until decades later was the erroneous assumption reconciled.



*Willdenow in his conservatory*

### **GEORGI’S UNEXPECTED FAME**

Also bereft of that knowledge was Willdenow. Given the tense political situation in Napoleonic Europe at the time, that was understandable. In an effort to clarify the classification, Willdenow placed his plants under a new genus, named for Johann

Gottlieb Georgi, an acquaintance from medical student days. Georgi had become a pharmacist in St. Petersburg, joining a large contingent of German tradesmen and academicians in that capital. He enjoyed the patronage of the Czarist court and accompanied other German scientists on explorations to Siberia and the Russian Far East between 1770 and 1774. When team leader Professor Falk committed suicide, Georgi edited Falk’s *Contributions to the Topographical Knowledge of the Russian Empire*. While he also pursued broad-ranging geographic and ethnocultural studies around Lake Baikal and the Altai, he was most emphatically not a botanist. Later works by Georgi dealt with the ethnic groups and natural history of the Russian Empire. He died in November 1802, so it is certain that (like Dahl) Georgi was honored posthumously for a flower he had never seen. Interestingly, if naming conventions had been followed by Willdenow, the georgina would properly have to be called ‘georgia’, as it was in one early publication. Since botanical nomenclature is supposed to be unambiguous (and Georgia already was established in geography) perhaps he decided to make the name more acceptable by adding a Slavic feminine suffix. Similarly, Thunberg had to struggle with ‘dahlia’ to avoid confusion with the *Dalea*, a member of the bean family.

