Cape heaths in European gardens: the early history of South African *Erica* species in cultivation, their deliberate hybridization and the orthographic bedlam

E.C. NELSON* and E.G.H. OLIVER**

Keywords: botanical history, Cape heaths, garden history, hybrids, nomenclature

ABSTRACT

This paper discusses the horticultural history of southern African *Erica* spp. in Europe, and especially in Britain, during the late eighteenth and the early decades of the nineteenth century. We note evidence for the deliberate hybridization of the so-called Cape heaths by European horticulturists, in particular by the English nurseryman William Rollisson and by the Very Rev. William Herbert. We discuss some of the nomenclatural consequences of the naming by miscellaneous botanists and nurserymen of the hundreds of new *Erica* species and hybrids, emphasizing the proliferation of eponyms. An appendix tabulates eponyms and their numerous orthographic variants published before 1835 within *Erica*, and provides the correct orthography for these epithets.

INTRODUCTION

The early history of the discovery of the flora of southern Africa is well summarized by Gunn & Codd (1981), and a brief historical sketch of the description and depiction of Cape species of *Erica* prefaces Baker & Oliver (1968). This paper concentrates on the horticultural history of southern African *Erica* spp. in Europe, notes evidence for deliberate hybridization of the so-called Cape heaths by European horticulturists and discusses some of the nomenclatural consequences of the naming of these plants by miscellaneous botanists and nurserymen.

The exploration of southern Africa by Europeans commenced, at least as far as extant historical documents record, with the voyages of Portuguese navigators in the late fifteenth century. With the discovery of this new route to the East Indies, Dutch, French and English vessels soon joined the Portuguese and began to sail around the south of Africa into the Indian Ocean. The formation of the Honourable East India Company in England and Vereenigde Oost-indische Compagnie in the Netherlands added further impetus and soon resulted in the first published accounts of the natural history of the region. The directors of these companies frequently instructed the captains of their vessels to bring back any objects that they thought would be of interest, not just commercially, and so by the early seventeenth century, at least, specimens of plants and animals from southern Africa were being brought to Europe. Undoubtedly, numerous botanical curiosities, including seeds, from the Cape of Good Hope reached Europe in the sixteenth century but they were not recorded in books or manuscripts and so have left no trace.

The earliest botanical specimen from the southernmost part of Africa illustrated in a European publication was an inflorescence of Protea neriifolia R.Br. depicted by L'Écluse (olim Clusius) in Exoticorum libri decem (Clusius 1605; Kerkham 1988; Rourke 1980). L'Écluse also first reported an instance of a Cape species in cultivation in a European garden, that being 'Ornithogalum aethiopicum', the bulbs of which had been collected by sailors at the Cape of Good Hope (Clusius 1611; Gunn & Codd 1981: 13). The inflorescence of Protea neriifolia is a tough object which will not disintegrate easily, and so its survival as a curiosity is not unexpected. Bulbs, corms and rhizomes, while perishable, stood a reasonable chance of remaining viable and reaching European collectors despite the numerous hazards of sea voyages in that era. Thereafter, southern African plants, especially those native to the vicinity of the Cape of Good Hope, became increasingly familiar, even commonplace, in European gardens, and numerous botanical works contained illustrations of Cape species, predominantly bulbs, succulents and plants with tough rhizomes.

While Erica spp. are abundant in the coastal peripheries likely to have been visited by sailors (Oliver & Oliver 2000), they are not so easy to preserve. Heaths resent disturbance and are unlikely to have survived transport alive at that period. This was not yet the age of scientific expeditions staffed by individuals who knew how to preserve, by pressing and drying specimens of plants such as Erica, or how to care for living plants on ocean-going vessels. Furthermore, the collection of seeds was probably a random happening, a seaman or curious traveller taking a chance when he saw some ripe fruits - gathering and keeping the minute seeds of Erica spp. would have required deliberate actions at the right time of the year. Bulbs and succulents were much easier to gather-they could be obtained in quantity and the chance taken that a few would survive the rigours of an Atlantic voyage in a sailing ship which, given the vagaries of winds and currents, usually took around three months.

* Tippitiwitchet Cottage, Hall Road, Outwell, Wisbech PE14 8PE, Cambridgeshire, United Kingdom.

** Compton Herbarium, National Botanical Institute, Private Bag X7, 7735 Claremont, Cape Town.

MS. received: 2004-03-09

THE FIRST CAPE HEATHS IN CULTIVATION IN EUROPE

There is evidence from the late seventeenth or early eighteenth century that at least one Cape species of *Erica*

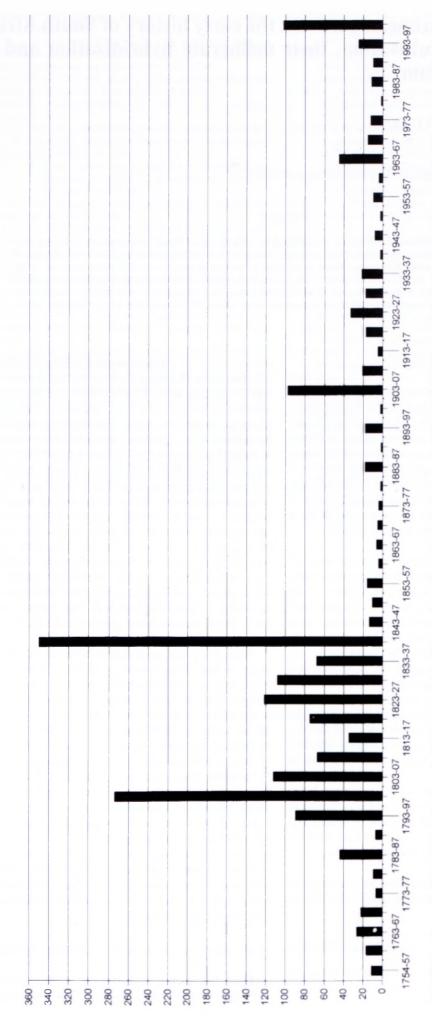


FIGURE 1.— Bar-graph showing the proliferation of published binomials in Erica, including horticultural hybrids, between 1753 and 2002. Note especially the five decades, between 1793—1842, when almost 1 300 binomials were published for the first time, corresponding to the era of Erica-mania in Europe.

Each bar represents a quinquennium (5-year period). The data for this figure were extracted from The Heather Society's database in February 2004; when extracting the data, no distinction was made between valid and

The two tallest bars represent the quinquennia during which important treatments of Erica were published: 1798–1802 (± 275 binomials), major portions of Andrews' Coloured engravings of heaths (see Cleevely & Oliver 2002) and Salisbury's (1802) paper, among others; 1838–1842 (± 350 binomials). Bentham's revision of Erica for Candolle's Prodromus (1839), and Regel's monograph (1842) as well as papers by others. Likewise, the three later, lesser peaks represent quinquennia when significant revisions of Erica appeared: 1903–1907, Guthrie & Bolus's for Flora capensis (1905); 1963–1967, Dulfer's revision (1964, 1965); 1998–2002, Oliver's (2000) invalid names, nor were names now regarded as synonyms excluded, although names which were new combinations and names published under generic names other than Erica were not counted.

monograph on Erica species with indehiscent and partially dehiscent fruits.

had been successfully cultivated in the Netherlands. Wijnands (1983) recorded that a painting by Maria Moninckx, dated between 1686 and 1706, contained in volume 8 of the unpublished 'Afteekeningen van verscheyden vreemde gewassen; in de Medicyn-Hoff der Stadt Amsteldam', depicts *E. curvirostris* Salisb., a species that grew in the vicinity of the Dutch settlement at the Cape of Good Hope. The painting cannot be precisely dated and was not published by Casper Commelin (Wijnands 1983: 94, 95), but its existence proves that before 1707 at least one Cape *Erica* had bloomed in Dutch gardens.

The earliest published illustrations of Cape Erica spp. date from the same period. Plukenet (1700) included three in Almagesti botanici mantissa: E. plukenetii L., E. curviflora L. and E. bruniades L. (Baker & Oliver 1968). Almagesti botanici mantissa was one of four volumes which Henrey (1975: 1: 140-142) described as a 'great catalogue of plants'. There is no evidence the Erica spp. were illustrated from living plants—on the contrary, the engravings seem to portray specimens that were plucked from the wild and pressed. This accords with what is known about the plants described and depicted in Plukenet's books. Many of the illustrations were done from specimens in his own herbarium that had been obtained from a worldwide network of correspondents (Henrey 1975: 1: 142). The same applies to Seba's Locupletissimi rerum naturalium (1734-1765) -Cape Erica spp. were illustrated from Seba's Kunstkamer, from pressed specimens, not from garden plants.

Indisputable evidence that Cape *Erica* spp. were in cultivation, at least in specialized collections, by the 1730s, is contained in the herbarium of George Clifford's garden at Hartecamp, the Netherlands, and in the associated book by Linnaeus (1738: 147, 148). According to Linnaeus, Clifford grew five different African heaths, including *E. curviflora* (Linnaeus 1738: 148), which Plukenet (1700) had illustrated.

Cape Erica spp. are not easy for northern European gardeners to grow, even today with modern computercontrolled glasshouses. The vast majority cannot be cultivated outdoors all year round because they are frostsensitive. They require lime-free soil, and when cultivated in containers, the watering regime has to be carefully regulated. The fact that they had to be kept indoors at least during the late autumn, winter and early spring meant that only gardeners possessing heated conservatories could attempt their cultivation. In the early eighteenth century, greenhouses were heated by either free-standing stoves or smoked-filled flues built into the walls. Furthermore, especially in winter, these buildings were poorly ventilated and had low light levels, two more factors that militated against success in the cultivation of these plants. However, as the design of greenhouses and conservatories improved, especially once roof slates were replaced with glass panes, and as gardeners became more familiar with the plants' cultural requirements, more species were successfully grown. Indeed, during the first half of the nineteenth century, the skills needed for the successful cultivation of Cape heaths had been so well mastered that these plants became extraordinarily fashionable.

The horticultural progress went in tandem with botanical exploration of the Cape of Good Hope.

BOTANICAL COLLECTORS

Linnaeus (1753) published 12 names for species of *Erica* from southern Africa—but *Species plantarum* was not a catalogue of plants in gardens. The number of named species increased steadily in the three following decades (Figure 1). By the end of the 1760s, about 63 Cape *Erica* spp. (including those originally placed in *Blaeria*) had been given Latin binomials. The 1770s saw 27 more names published, and during the 1780s another 54 *Erica* names appeared in print, almost 40 of these being coined by Thunberg (1785).

During the late eighteenth century, Cape Erica spp. were introduced into European gardens, principally by seed gathered in the wild. In 1789 William Aiton published Hortus kewensis, for which Daniel Solander supplied the descriptions of seven new species of Erica from the Cape; one proved to be an already described species, but six were previously unknown. These had all been raised from seed collected by Francis Masson (1741-1805), who was the first collector to make an impact in the horticultural, as distinct from the purely botanical, aspects of Cape Erica spp. The new species originated from his first visit to the Cape, which had lasted two and a half years, from October 1772 to March or April 1775. According to Masson's (1776) own accounts of his 'three journeys from Cape Town into the southern parts of Africa', most of his Erica seeds were obtained during his first extended expedition which started in December 1772 and ended in late January or early February 1773 (Masson 1776; Bradlow 1994). Of that first expedition, from Cape Town via Paarl, Franschhoek, Stellenbosch and Swartberg to Swellendam and back, Masson (1776; Bradlow 1994: 109) stated: 'It was on this journey that I collected the seed of the many beautiful species of Erica which, I find, have succeeded so well in the Royal Garden at Kew'. Solander (Aiton 1789) attributed to Masson the collection or introduction of 18 Cape species during 1774; two of his collections are dated 1773 and three are dated 1775. In all, more than half of the 41 Erica spp. listed at Kew in 1789 had been raised from seed obtained by Masson at the Cape.

Masson returned to England in 1775, and 11 years later, in 1786, went back to the Cape where he remained for more than nine further years. While it appears that he did not travel as extensively during this second visit, the extended sojourn clearly gave Masson the opportunity to plan seed-collecting trips; unlike the 'passing' collector, he could go to a particular place at different seasons, gathering specimens in flower for making into herbarium specimens and subsequently returning to collect fresh, ripe seeds for introducing the particular plant into gardens. By 1792, six years after his return to Cape Town, the specially built greenhouse in the Royal Garden at Kew contained more than 80 different Erica spp. (Hepper 1989; Bradlow 1994). Aiton (1811) attributed a further 63 Erica spp. to Masson, collected and introduced between 1787 and 1795, some through James Lee's Hammersmith nursery (Willson 1961), making Masson's total around 86.

In a contemporary commentary on the influx of Cape heaths due to Masson's explorations, Thomas Martyn, professor of botany at the University of Cambridge, in his edition of Philip Miller's *The gardener's dictionary* (Martyn '1807') observed that Miller 'so late as the year 1768 ... [had] not [listed] one of those beautiful natives of the Cape of Good Hope, which now form so great an ornament to our green-houses or dry stoves'. In contrast, Martyn ('1807') listed 83 species, and noted that James Donn, curator of the Cambridge Botanic Garden, 'has collected upwards of sixty of these Cape heaths, which he cultivates this year 1795; though he was appointed to his office only at Michaelmas 1794'. Donn's own *Hortus cantabrigiensis* (1796) accounts for 59 named Cape heaths.

Other collectors were active for private or commercial patrons. William Paterson, sent to the Cape in 1777 by the Countess of Strathmore to collect for her garden, does not feature in *Hortus kewensis*. He remained at the Cape until 1780, making four plant-collecting trips, and sent seeds back to various contacts in England including James Lee (Willson 1961). While the introduction of no *Erica* spp. is attributed to him, Paterson was commemorated in *E. patersonii* Andrews. (Contrary to Coats's footnote (1969: 257), William Paterson was indeed the same person who was afterwards governor of New South Wales.)

Emperor Joseph II of Austria sent two gardeners, Georg Scholl and Franz Boos, to the southern hemisphere to collect for the royal gardens in Vienna. They met Francis Masson at the Cape and went on a brief collecting trip with him. Boos left in February 1787 for Mauritius, leaving Scholl at the Cape to continue collecting. Boos returned to the Cape briefly a year later and then travelled back to Austria with a large collection of specimens, apparently including living plants. However, once again Scholl remained behind: indeed, he was 'obliged to remain ... contrary to his orders' (see Bradlow 1994) in Cape Town until 1799 because he was unable to get a passage on a ship that would also carry his living plants. For a while Scholl lived under the protection of Colonel Robert Jacob Gordon (1743-1795), in whose garden he cared for the plants he had collected. From these he harvested seeds which were sent to Vienna (Gunn & Codd 1981: 170, 171). When he did return to Vienna in 1799, Scholl evidently also had a substantial consignment of live plants including Erica spp. (Hitchcock 2003; Oliver 2003), a most remarkable achievement because, as far as is known, all other eighteenth and early nineteenth century introductions were effected by seed. Scholl's plants do not appear to have had as much horticultural impact as Masson's or Niven's (see below), and no new species were described from his or Boos' herbarium specimens (Dulfer 1965). Scholl died in Vienna soon after his return from the Cape and was commemorated by the English nurseryman Conrad Loddiges (1804, as E. schollii) in E. scholliana:

'This name has been given in memory of our friend the late George Scholl, sent by the Emperor Joseph II to collect plants in the vicinity of the Cape of Good Hope. He sent home great quantities, and in 1799, after remaining twelve years in South Africa, returned with a large cargo to Vienna, where a few years afterwards he died [Loddiges 1821].'

(Regel (1842) regarded *E. scholliana* (as *E. schollii*) as a putative hybrid between *E. empetrina* L. (as *E. empetrifolia* L.) and *E. plumosa* Thunb., whereas Dulfer (1965: 101) placed *E. scholliana* in synonymy under *E. amoena* Wendl.)

As far as introduction of Cape heaths into cultivation in England is concerned, the next, and most prolific collector represented at Kew before 1811 was James Niven (± 1774–1827) who collected in the Cape region between 1798 and 1812 (Nelson & Rourke 1993), returning briefly to England in 1803. His first patron was George Hibbert, but after 1803 he collected for a consortium including the Empress Josephine of France and the London nursery of Messrs Lee and Kennedy. Aiton (1811) attributed 31 Erica spp. to Niven, dating the introductions between 1799 and 1804. His introductions were undoubtedly more numerous but accurate data are not available because most subsequent publications do not attribute individual species to particular collectors (see Appendix 1 for a list of Erica spp. introduced by Messrs Lee & Kennedy). Niven collected thousands of herbarium specimens—his Erica series bear numbers up to 297 but there are many instances of individual numbers being repeated (for instance, seven sheets numbered 21 are known, and these represent three distinct species from three separate localities). Of course he would also have collected species that had already been introduced by Masson. An indication of the extent of his seed gatherings can be obtained by analysing his so-called Erica manuscript (now in the Royal Botanic Gardens, Kew) which is, in fact, an hortus siccus that he compiled, presumably to enable him to link herbarium specimens gathered from plants in bloom with seeds gathered weeks or months later. The extant manuscript, which relates to his earlier visit to the Cape, is incomplete yet contains about 250 descriptions of heaths; 98 of the entries include a note about seed, usually indicating the month or months when this was ripe. Occasionally Niven noted that seed was not obtained: under 'Erica smithiana' he recorded that seed was 'near ripe or gone April' [f. 59]; of another unnamed species he recorded, 'Good seed is scarcely to be had in the winter months' [f. 41^r]; and while seed of 'Erica thunbergii' was ripe in December, Niven wrote 'not got' in the manuscript [f. 59^v].

Few subsequent collectors matched Masson's and Niven's combination of gathering both herbarium specimens and fresh seed. Aiton (1811) credited John Roxburgh ($\pm 1777 - \pm 1817$) with the introduction of two Erica spp. There is no doubt that he knew Niven and worked alongside him when both men were at the Cape between 1798 and 1804. Young Roxburgh had arrived early in 1798, accompanied by his father, William (1751-1815) who remained at the Cape only until October 1799 (Gunn & Codd 1981: 302, 303). At least one of the Roxburghs provided names for new Erica spp.; Salisbury (1802) credited John with 20 manuscript names, while Niven's herbarium specimens bear at least 30 other names attributed simply to 'Roxburgh'. Niven's Erica manuscript also contains references to names coined by Roxburgh, but it is not now possible to determine unequivocally whether this was father or son-William is the more likely person to have coined names.

Salisbury (1802) also credited Jacob (? James) Mulder, about whom nothing more is known, with collecting Cape heaths, but Mulder seems only to have gathered herbarium specimens.

By the end of the 1810s, the flow of *Erica* seeds into Europe seems to have virtually ceased. Following Niven's return to Britain in 1812, there was apparently no-one actively seeking new Cape heaths for introduction, with one enigmatic exception. Andrews (post 1823), when describing E. baueri, recorded that 'We found this new species ... in bloom at the Hammersmith nursery in the autumn of 1823, under the specific title of Bauera [sic] ... Throughout this extensive Genus of plants, we do not know any one it resembles at present: but in three or four years time the case may be different, Mr Lee having a collector now in the interior of the Cape in search of novelties; and should his attempt in exploring that botanic mine prove successful, we may expect an importation of many distinct species and beautiful varieties'.

The name of the collector has not been determined beyond doubt, nor what he may have introduced, if anything. It is possible that the individual was James Bowie whose interest in Cape heaths is well demonstrated by an article, written by him (Bowie 1826), relating his observations on the plants in their natural habitats to their cultivation in English gardens. Bowie returned to the Cape 'on his own account' (Coats 1969: 264; Gunn & Codd 1981: 101) in 1827—there is no explicit statement about him collecting for Lee, but it is not at all unlikely that Lee was among the clients Bowie may have secured.

Undoubtedly one reason for the falling off in introductions was the cost of sending, equipping and maintaining a collector at the Cape of Good Hope for not less than a year. There was, however, a much less expensive way of ensuring a supply of beautiful new heaths—artificial hybridization.

*SILENTLY AND SUCCESSFULLY': THE DELIBERATE HYBRIDIZATION OF CAPE ERICA

Hitherto there has been no written account of the history of deliberate hybridization of *Erica* spp. in European gardens, although William Rollisson's work (see below) on Cape heaths was the first 'extensive program of breeding new ornamental plant varieties' (Elliott 2001; see also Elliott 2004: 237). Gorer (1978: 64), unaware of Rollisson's successful pioneering attempts at cross-pollination, was, like others, misled and wrote:

'It is possible that William Rollisson, who was later to found a nursery that specialised in Cape Heaths, travelled there [Cape of Good Hope] at the start of his career. *Hortus Kewensis* [Aiton 1811] credits him with the introduction of fifteen species between 1796 and 1800 and if he did not collect them himself it is not clear how he could have obtained them.'

In fact, the list of *Erica* spp. credited to Rollisson by Aiton (1811) included 16 names, and all are now generally acknowledged as applying to hybrids, and it is clear that Rollisson never ventured to the Cape, nor did he maintain a collector there. Gorer (1978: 138) did note Herbert's work on raising hybrids of *Gladiolus* and of *Erica* but did not expand on the latter. While both Bentham (1839) and Regel (1842) make it clear that they considered certain 'species' were hybrids, the origins of many have remained vague or entirely unknown.

William Rollisson of Tooting

The most prominent name in nineteenth-century accounts of European-raised Erica hybrids is that of William Rollisson (± 1765-1842), founder of the Springfield Nursery, Upper Tooting, Surrey, which was famous for its orchids. (Rollisson's surname was, and still is, very frequently misspelled Rollinson.) Undoubtedly, he was the first to raise artificially created hybrids of the Cape heaths but, for commercial reasons, he never announced his achievement. His priority is made clear by two sources. Firstly, by a short note written by his eldest son George (± 1799–1879) and published in *The Gardeners' Chronicle* on 8 July 1843 in which were listed the names of more than 90 hybrids raised by William Rollisson (Rollisson 1843). The second source, which contains the most remarkable account of early attempts to cross-breed Cape Erica spp., was written by W.H. Story (1848) who was himself an important hybridizer, although he is an obscure person who is not given an entry in Desmond & Ellwood (1994). Story

'It is now about fourteen years [i.e. ± 1834] since I became imbued with a taste for this interesting pursuit; imparted, no doubt, by the frequent instructive conversations I used to have with my friend the late Mr Rollisson, of Tooting, than whom a more persevering hybridiser of the Erica never lived. For forty years and upwards he silently and successfully carried on his favourite pursuit, introducing, during that long period, most (I was going to say *all*) of the choicest and most favoured varieties now in cultivation.'

In 1826, two lists of Messrs Rollisson's heaths were published in *The Gardener's Magazine* (Rollisson 1826a, b); the latter was a month-by-month account of those in bloom. These lists included 288 names. No hybrids are mentioned, nor is any explicitly indicated, unless the plant called 'Rollisson's Blanda' is counted. Rollisson's second list was followed by James Bowie's (1826) article about the cultivation of Cape heaths.

The Hon. and Very Rev. William Herbert

Whereas Rollisson remained 'silent', The Hon. and Very Rev. William Herbert (1778–1847), one-time dean of Manchester, an authority on Amaryllidaceae and Iridaceae, was one of the first to write about 'hybridization amongst vegetables' (Herbert 1847; Stearn 1952). In a paper (Herbert 1847; 87) written shortly before his death there is a little-known paragraph about Cape *Erica* hybrids:

'We learn that most of the fine heaths of South Africa are very local. About thirty years ago I announced that I had crossed E. vestita coccinea with jasminiflora (though Mr Salisbury fancied they were of two separate genera, on account of the shape of the seed-pods); and it is now ascertained that Mr. Rollisson, of Tooting, raised E. jasminiflora by mule impregnation between E. Aytoni [sic] and ampullacea, and several others, of which no wild specimens have been found, and kept his secret until his death for the sake of profit. The genus Erica not yielding its pollen till the anthers are forcibly touched, and having the stigma therefore extremely likely to be hybridized in a wild state, there seems reason to believe that the species have been multiplied on the African wastes not merely by the variation of soil and position, but still further by the intermixture of the various forms which had so arisen.'

Herbert first announced his work on Erica when he spoke about hybrids at a meeting of the Horticultural

Society of London on 7 July 1818. The published version of this paper (Herbert 1818: 196) concluded with this scanty comment: 'and the new heaths I have already obtained, are most distinct and remarkable, the individuals of each new species [sic] being perfectly uniform'. However, in his monograph on Amaryllidaceae, Herbert (1837) was more explicit: 'Several most beautiful mule Gladioli and Ericae, which had been raised at Mitcham between the years 1808 and 1814, and removed from thence to Spofforth, have also flowered there, but had not been made known to the public till the year 1819 [sic]' (Herbert 1837: 356). (Herbert was appointed Rector of Spofforth, Yorkshire, in 1814.)

Remarkably, while the names given to many of Rollisson's hybrids are known—there are more than 170 entries in The Heather Society's database—not a single record of any of Herbert's hybrids has been traced and there is no *Erica* bearing his name. The explanation lies in the fact (see below) that Herbert lost some (if not all) of his Cape heath hybrids when he moved from Mitcham to Spofforth.

Herbert (1837: 374) made some remarkable comments about pollination biology in Cape species of *Erica* and drew some equally remarkable conclusions:

'In the tubular African heaths the pollen remains confined, unless the anthers are touched by something inserted, as the point of a pin or the proboscis of an insect, when they spring asunder and discharge it. This genus, therefore, affords greater facility of intermixing, and it is probable that some of the native species, which are said to be quite local, have been produced by accidental intermixing ... Amongst other crosses of Ericae, I obtained at Mitcham many plants from two very dissimilar, namely, from Jasminiflora by vestita coccinea, which had the foliage slender and near an inch long. The late Mr. Salisbury had conceived that those two species, being distinguished by a shorter and a large and more pointed pod, were referable to two distinct genera to which he had accordingly assigned names, and he told me that I should fail in my attempts to cross them; which was answered by shewing him the seedlings then several inches high. They were all lost on, or soon after, removing to Spofforth before they had flowered, though one of them was above a foot high.'

Not everyone approved of Herbert's work: 'Soon after the publication of [my] communication to the [Horticultural] Society, I was accosted by more than one botanist with the words, 'I do not thank you for your mules,' and other expressions of like import, under an impression that the intermixture of species which had been commenced, and was earnestly recommended to cultivators, would confuse the labours of botanists, and force them to work their way through a wilderness of uncertainty' (Herbert 1837: 336).

The facility with which hybrids could be created by artificial cross-pollination of Cape *Erica* spp. was evidently widely appreciated in the first half of the nineteenth century. Regarding the plethora of hybrids, a unidentified reviewer using the initials E.M., writing in *The Gardeners' Chronicle* on 14 January 1843 about a recently published monograph (Regel 1842) on heaths, commented:

*The number [of species] enumerated is 335, besides varieties, but Mr. Regel includes as species many of the garden

hybrids, which are now multiplied almost indefinitely, so as to render almost fruitless any attempt at describing them on paper. Of two hybrid seedlings raised from the same parents, one will often have more of the character of one of the parents than the other; and thus a complete description of all the hybrids in cultivation would have to include a separate account of almost every individual raised. It appears to us that it would have been better, even for garden purposes, to have enumerated as species only such permanent ones as are really so in a botanical sense; and after each species to have referred to the hybrids which either are known to have that species as one of their parents, or to have such an affinity to it to make that probable.'

Thus we have to view the population of Cape heaths in cultivation in Europe during the last decade of the eighteenth and first half of the nineteenth centuries as comprising a vast assemblage of wild-collected, seed-raised species, multifarious seedlings that were primary hybrids, and, undoubtedly, innumerable backcrosses. The concomitant variation presented new challenges, especially in identification and naming.

Other hybridizers

Other British nineteenth-century nurserymen and gardeners who raised, or claimed to have created, hybrid Cape heaths were William McNab (1780–1848), author of the first English-language manual on the cultivation of Cape heaths (McNab 1832), and superintendent of Edinburgh Botanic Garden (E. ×macnabiana, E. ×neillii); Andrew Turnbull (1804-1886), gardener at Bothwell Castle, Lanarkshire, Scotland, whose hybrids included E. xtortuliflora and several others which were given 'fancy' (i.e. cultivar) names; W.H. Story, the originator of E. xspenceriana, who was quoted above and about whom so little is recorded; and Messrs Lee and Kennedy, Vineyard Nurseries, Hammersmith, whose introductions include at least two putative hybrids E. ×bandonii and E. ×coventryi. Among the others, we single out for mention John Williams, gardener to John Willmore of Oldford, near Birmingham, who raised E. ×pseudovestita, E. ×pyriformis and E. ×willmorei (a much confused and misapplied name; see Nelson & Oliver 2003). Maund & Henslow (1839), noting that E. xpseudovestita was 'one amongst many hundred varieties raised by the same indefatigable cultivator', ventured the opinion that 'generating, as it may be termed, numerous attractive plants, like that which we now figure, may be counted amongst the benefits accruing to society by the united zeal of a liberal proprietor and intelligent gardener.' When an illustration of E. xmurrayana, one of Turnbull's crosses, was published, Joseph Paxton (1844) remarked that 'The practice of hybridising Heaths has now been carried to a considerable extent by some cultivators, and our pages [Magazine of botany] have contained figures of several excellent seedlings. But no one will assert that there is not an ample field for further improvement in this way, since the genus is so very large, and the species so varied'.

There can be little doubt, for comments by various authors including Regel (1842), that hybrids were also produced in gardens in France and Germany but detailed histories are wanting.

While the principal purpose in creating the hybrids was to ensure a continuing supply of novelties for customers, towards the end of the nineteenth century, nurserymen were considering the possibility of deliberately breeding better plants. One of the aims of the breeders of Cape heaths was to produce flowers that were not covered by gum because the sticky flowers trapped dust and became unsightly; for example, among heaths listed in the horticultural press during 1878 was a 'gumless' seedling named *E.* ×dennisoniana (Journal of horticulture and cottage gardening 60: 91).

By the late 1870s, the number of distinct Cape heaths in collections had diminished very substantially: in 1874 Joseph Dalton Hooker wrote, 'Many years ago the Cape Heaths formed a conspicuous feature in the greenhouses of our grandfathers, and in the illustrated horticultural works of the day These have given place to the culture of soft-wooded plants—Geraniums, Calceolarias, Fuchsias, &c.; and the best collections of the present day are mere ghosts of the once glorious Ericeta of Woburn, Edinburgh, Glasgow, and Kew. A vast number of the species have indeed fallen out of cultivation No less than 186 species of *Erica* were cultivated [at Kew] in 1811, now we have not above 50, together with many hybrids and varieties [Hooker 1874]'.

Instead, nurserymen, at least those around London, were concentrating on mass production of a few selected Cape heaths for the winter pot-flower market. Hooker (1874) remarked that 'a few easily propagated hybrids for decorative purposes are all that are to be seen of this lovely tribe in most of the best establishments of England', while a report in *The garden* early in 1879 noted that growers were known to sell more than two hundred thousand Cape heaths in the pre-Christmas period—'About Christmas time the markets are crammed with little bushy plants' (Anon. 1879). The writer commented that in some English nurseries Cape heaths were growing as 'freely as scarlet pelargonium'. A little more than a decade later, Watson (1892) made similar remarks.

Hybrids between European ('hardy') and Cape heaths

Having so easily achieved hybrids between the exotic Cape *Erica* spp., it was not unnatural for European horticulturists to speculate about the possibilities of crossing these with the less showy but frost-hardy European species. The idea was certainly current in the mid-1800s as shown by this comment about 'crossing splendid species of South Africa with the hardy natives' in *The Gardeners' Chronicle* of 17 March 1849: 'I need not say that a successful result would be most interesting' ('A Devonian' 1849; see also 'A Lancastrian' 1849). George Gordon (1863) wrote on the same topic in 1863 without adding anything new.

In fact, there is no evidence that crosses between the Cape and European species were tried, let alone effected, during the nineteenth century. Only in the late twentieth century was this achieved and primary hybrids were announced between *E. arborea* L. and *E. baccans* L. (*E. xafroeuropaea* D.C.McClint.) (Jones 1988; McClintock 1998, 1999). Other reported examples are (the African species being named first) *E. bergiana* L. × spiculifolia Sm. [McClintock 1998; at least two clones of this are presently cultivated in Europe and western North America (Kay 2003: fig. 2)], *E. curvirostris* × arborea, *E. baueri* Andrews [as bauera] × australis L., and *E. sub-*

divaricata P.J.Bergius × carnea L. (Jones 1988). In the 1970s John Crewe-Brown, in Johannesburg, attempted various crosses between European and African species including *E. caffra* L. × australis (in Joyner 1979).

PROLIFERATION OF EPONYMS & ORTHOGRAPHIC BEDLAM

In the decades immediately following publication of *Species plantarum* (Linnaeus 1753), the choice of names for the new *Erica* spp. was uncomplicated. A principal character, or the superficial resemblance to plants of another familiar genus, or a toponym provided the majority of the epithets. Only one species was named after an individual and that was Linnaeus's *E. plukenetii*, commemorating Dr Leonard Plukenet who, as noted, had illustrated the species in 1700.

By the end of the 1770s, six more individuals had been commemorated by Linnaeus, by his son (Linnaeus '1781') and by L.J. Montin (1774): P.J. Bergius in *E. bergiana*; James Petiver in *E. petiveri*; Anders Sparrman in *E. sparrmanii*; Carl Thunberg in *E. thunbergii*. Linnaeus the younger also encapsulated Francis Masson's name in *E. massonii*, and named *E. monsoniana* after Lady Ann Monson; both these epithets were published in 1782 (Linnaeus '1781'). Still, the majority of specific epithets were related to a distinctive characteristic of the new species.

The sudden and continuing influx after 1772 of substantial numbers of new Erica spp. presented a major problem for European botanists. Studying, describing and naming the countless new plants that Masson and Niven, in particular, had collected, was evidently beyond the capacities of the botanists then active at least in Britain—and the Cape of Good Hope was not the only place yielding undreamt of botanical riches. Compounding the difficulties for the botanists were the very numerous seedlings of unknown species of Erica that were sprouting in gardens throughout Britain, France, Germany and other countries. Nurservmen who had obtained seeds or, subsequently, seedlings required names for these so that they could sell the plants. The botanists were either overwhelmed or indifferent, and so the naming of the Cape heaths became a haphazard process with horticulturists, ill-versed in, or entirely ignorant of, the principles of botanical nomenclature, taking over the primary role of coining and applying names. Not only did the nurserymen give names to their plants, they also printed those names in catalogues their businesses demanded this—with accompanying descriptions, no matter how brief, and not infrequently the given names were misspelled or misprinted. The results approached bedlam with as many as nine different variants of a single epithet (as prime example is E. savileae Andrews, see Nelson & Scarbrough 2003).

It is clear from manuscripts and published catalogues dating from the first decade of the 1800s that many Cape heaths had been given names in gardens and nurseries without the normal accompaniment of detailed, comparative study. It is also evident that collectors, including Francis Masson (1776; see Bradlow 1994), James Niven and the Roxburghs, coined names in the field and used them to label their pressed specimens and seed packets.

Many of these names persisted and were published, usually without accompanying descriptions, in nurserymen's catalogues and garden lists. For example, the name 'Erica hibbertii' appears on James Niven's herbarium specimens (no. 171); on one of these, in the herbarium of Trinity College Dublin (TCD), the epithet is attributed to Niven. The particular epithet was employed at the Dublin Society's Botanic Gardens, Glasnevin, in 1802, undoubtedly attached to a plant purchased from Messrs Lee and Kennedy (Nelson & McCracken 1987), and it appeared in print at least a year before Andrews formally published the binomial in Coloured engravings of heaths (1805). This is not an isolated example. The name E. humea was first printed in 1809, yet a description was not formally published in The Botanical Cabinet (Loddiges 1817-1833) until a decade later when the epithet was rendered E. humeana. Likewise, E. scholliana was described in 1821, but that name, as E. schollii, was in print no less than 17 years earlier.

There were other problems. Horticulturists in different countries produced lists and catalogues without knowing whether a particular seedling *Erica* had already been named elsewhere—they had neither the expertise, nor resources, nor time to carry out the necessary enquiries and research. Furthermore, voucher herbarium specimens were hardly ever preserved so that when botanists eventually came to sort out the nomenclatural tangle, they had no material for comparison. Add to that an opinionated, acerbic English botanist: Richard Anthony Salisbury (1761–1829).

Richard Salisbury

134

To his credit, Salisbury did attempt to produce a proper monograph of the genus (Salisbury 1802), but he had some contrary opinions about names, rejecting any that commemorated individuals, and when in his opinion a descriptive epithet was not appropriate he simply substituted one that he deemed better.

In Rees' *The Cyclopaedia*, the president of the Linnean Society, James Edward Smith (1809), in what amounts to a precis of Salisbury's monograph, applauded Salisbury's attempt to arrange the species in natural subdivisions. In fact, Salisbury had a remarkable, prescient view of *Erica*, as Smith acknowledged. Salisbury (1802) had rejected Linnaeus' genus *Blaeria*, and clustered together 15 species 'having but four stamens', some of which had formerly been in *Blaeria*:

'Nor can we much object to the union of these two genera, except that in so vast a tribe, we may be glad of even so slight a circumstance as number to make a genus, when there is moreover such a difference in habit as this very arrangement of Mr. Salisbury's implies. If indeed a few species of *Erica*, here and there in the different natural subdivisions, were tetrandrous, no-body would think of separating them for that reason [Smith 1809].'

However, Smith was not impressed by some of Salisbury's nomenclatural decisions. Regarding *E. nigrita* 'of Linn[aeus] and Thunberg, so called from its conspicuous dark anthers, elegantly contrasted with the white corolla and calyx', Smith noted that Salisbury 'is pleased to denominate [this] *volutæflora*'. The name of 'our elegant English' *E. tetralix* L. was 'changed by Mr.

Salisbury to *botuliformis*, sausage-shaped. ... Next comes by itself our common British *cinerea* [L.] ... more happily, but without any necessity, altered to *mutabilis*. However, *E. milleflora* Bergius was, in Smith's view, 'well retained by Mr. Salisbury, in preference to the inaccurate one, *paniculata*, given by Linnaeus'.

Another to object to Salisbury's alteration of established names was Carl Willdenow (1809: 415), in a catalogue of the Royal Botanic Gardens, Berlin. Noting that he was deliberately omitting 'several species [of *Erica*] grown from seeds, the flowers of which I have not yet seen', he reproached Salisbury thus:

'The most illustrious Salisbury ... illustrated the genus of Erica with many observations and, using this occasion, reproached me with having accepted inappropriate and false gardeners' names. Names of plants [that are] now widespread, just as [those] applied long since, are to be scrupulously preserved. In the same way, whatever the naming of a plant is, it suffices if only its character can have fixed [distinguishing] marks. The changes which the illustrious Salisbury has adopted in his *Prodromus* [Salisbury 1796], in this dissertation [Salisbury 1802] and in other places always lead to the detriment of science. Only under pressing necessity have I altered plants' names to others'. [Translated from the original Latin by P. H. Oswald.]

Eponyms

Returning to the matter of specific epithets derived from personal names, at this period there were no rules governing the formation of such names. Smith (1809) made this most pointed comment at the end of his entry on *Erica* for Rees' *The Cyclopaedia*:

'We trust, that those who may have occasion to describe new heaths in future, will, as far as they are competent, keep the above arrangement in view, as they will find it very instructive, however they may differ from Mr. Salisbury in principles of nomenclature. To this subject we have scarcely found it necessary to advert, except occasionally, and we rather pass over in silence what we cannot approve. This botanist rejects all names of persons as applied to the species of any genus. Mr. Dryander once began a more useful reformation of such names of *Ericæ*, making those which commemorate a writer on the subject end in *ana*, as *Sebana*; those which apply to a collector only, in the genitive case, as *Massoni*. The greatest and most correct information is still to be expected from this able botanist, in the intended new edition of Mr. Aiton's *Hortus Kewensis*, where the genus of *Erica* must always make a principal figure.'

The topic of the correct termination for epithets derived from personal names has been vexatious ever since. Lindley (1832) commented on it and, as Stearn (1973) pointed out, several attempts have been made to differentiate the use of substantive and adjectival (with the termination -anus, -a, -um) epithets along the lines enunciated by Dryander and Lindley, but they have never been successful. Commenting on Lindley's remarks, Stearn (1973: 294) noted that 'most of those who then and thereafter named new species paid no attention whatever to it; probably they never knew such a distinction had been proposed'.

In the second edition of *Hortus kewensis* the principles described by Smith (1809) were followed, with, for example, the *Erica* epithets *archeria* amended to *archeriana*, *hibbertia* to *hibbertiana*, *lambertia* to *lambertiana*, and even *monsoniana* to *monsoniae*. Yet this

did not, and does not, resolve the difficulties—under the current rules of nomenclature [International Code of Botanical Nomenclature, (St Louis Code): Greuter et al. 2000], it is not permissible to change the termination of an epithet except to correct certain errors (for example, if the gender is inappropriate); misinterpretation of the role of the person commemorated is not deemed to be an error. Changing archeria to archeriana is forbidden but amending the termination to correct the gender is required—archerae is the correct orthography.

Examining the earliest use of personal names for epithets within *Erica* (Appendix 2), it is clear that their authors (Linnaeus father and son, and Montin) were abiding by this, then unwritten, distinction: *petiveri*, *sparrmanii* and *thunbergii* after Petiver (author), Sparrman (collector) and Thunberg (collector), whereas *bergiana* and *monsoniana* were in compliment to Bergius and Lady Monson. It was the advent of essentially horticultural publications that precipitated a large increase in personal epithets, and the ensuing bedlam.

The abundance of unnamed *Erica* spp. following especially Masson's and Niven's plant introductions from the Cape provided many opportunities to coin names. While the majority of new species were given names that encapsulated a distinctive morphological character, the need for horticulturists especially to recognize patronage also led to a proliferation of personal epithets.

Henry Charles Andrews issued the first fascicle of his monumental four-volume Coloured engravings of heaths on 15 October 1794 (Cleevely & Oliver 2002: 264); he was later to issue a six-volume edition, a 'green-house companion', titled The heathery, starting in 1805 (Cleevely et al. 2003). In the first 17 fascicles of Coloured engravings of heaths, all published before 1800, he used the following names (their original orthography being retained here) to dedicate species to William Paterson (E. pattersonia) in 1795, William Aiton (E. aitonia) in 1796, Sir Joseph Banks (E. banksia) and James Lee (E. leea) in 1797, and James Walker (*E. walkeria*) in 1799. By 1830 when he had completed publication, Andrews had added yet further personal epithets (see Appendix 2). In all, Andrews (1794-1830) commemorated in the names of African Erica spp. more than two dozen individuals few of whom had any connection with the Cape of Good Hope. Towards the conclusion of Coloured engravings of heaths, Andrews (± 1823) himself commented, 'In the genus Erica it is sometimes very difficult to find an appropriate or un-occupied specific title'.

Other horticulturists joined suit. Conrad Loddiges, to give just one example, published the following personal epithets within *Erica* in *The Botanical Cabinet* (Loddiges 1817–1833): *E. bonplandia* (1819); *E. bowieana* (1824); *E. celsiana* (1830); *E. cliffordiana* (1817); *E. humeana* (1819); *E. parmentierii* (1818); and *E. scholliana* (1804).

One frequent feature of the names deriving from horticultural works published at the end of the eighteenth century and during the first half of the nineteenth century is the use of eponyms with the termination -ia (or -a). In the past this has been interpreted as indicating that the author

was using a pre-existing generic name in apposition to the name Erica (Oliver & Oliver 2002: 43). For example, it might be thought that in coining E. banksia, Andrews was employing the younger Linnaeus's generic name Banksia (Proteaceae), or in the case of E. hibbertia that he was using the generic name Hibbertia (Dilleniaceae). Whereas the generic names Aitonia, Banksia, Bauera, Hibbertia and others (see Table 1) already existed when Andrews published E. aitonia, E. banksia, E. bauera and E. hibbertia, there have never been genera named, for example, Bandonia, Coventrya, Savileia, Shannonea, Templea or Uhria. Examination of the chronology of other names makes clear that they also are not generic names used in apposition but are substantival epithets with incorrect terminations. Archeria and Nivenia were coined after the publication of these epithets for species of Erica-Ventenat published *Nivenia* (Iridaceae) in 1808 (Ventenat 1808); Hooker published Archeria (Epacridaceae) in 1860 (Hooker 1860).

Under the present International Code of Botanical Nomenclature (St Louis Code) (Greuter *et al.* 2000), such names have to be corrected—they have incorrect terminations. The *-ia* has to be replaced with the appropriate genitive ending. This means that it is essential to establish the gender of the person who was commemorated. The variants' spellings can be treated as orthographical variants because only one nomenclatural type is involved, and under Article 61 (Greuter *et al.* 2000) the one variant 'that conforms to the rules' needs to be specified and retained. Oliver & Oliver (2002) have corrected the terminations for *E. banksii*, *E. baueri* and *E. hibbertii*, and the remaining names are corrected in Appendix 2.

CONCLUSION

Erica is one of the largest genera among flowering plants containing ± 860 species; about 760 of these are endemic in southern Africa (Oliver & Oliver 2003), ± 50 are recorded in Madagascar and adjacent islands, while another 30 Erica species inhabit Africa north of the Zambezi (excluding the extreme northwest) (see Oliver 2000: fig. 15). Around 20 species, plus three naturally occurring hybrids, are recognized in Europe, Macaronesia and adjacent parts of northwest Africa, and western Asia.

Given these facts alone, it is not surprising that during the past 250 years, since the publication of Species plantarum (Linnaeus 1753), many more than 860 names have been bestowed on Erica species. The database for the 'African' ('non-hardy') section of the International register of heather names (Nelson & Small 2004) dramatically demonstrates the nomenclatural bedlam to which we have referred. While the total of all names reported on the International Plant Names Index website (http://www.ipni.org) for Erica (as redefined in Oliver 2000) and its component genera is around 3 350, the database compiled by The Heather Society now includes more than 6 100 entries for names. More than two-thirds of these ($\pm 4200 = 69\%$) are records comprising only a specific epithet, whereas ± 1650 record names of taxa at the rank of subspecies or below (27%). Only \pm 310 cultivar names are in this part of the database (5%).

TABLE 1.—Eponymous specific epithets in *Erica*: epithets with the termination -ia or -a (see Appendix 2 for details) which correspond with published generic names giving the respective dates of publication

Epithet in Erica	Date of Generic name(s): family: author epithet		Date of generic name	
aitonia	1796	Aitonia: Sapindaceae: C.P. Thunberg	1776	
archeria	1803	Archeria: Epacridaceae: J.D. Hooker	1860	
banksia	1797	Banksia: Thymelaeaceae: J.R. Forster & J.G. Forster Banksia: Proteaceae: C. Linnaeus f.	1775 1782	
bauera	post 1823	Bauera: Cunoniaceae: H.C. Andrews	1801	
beaumontia	post 1828	Beaumontia: Apocynaceae: N. Wallich	1824	
blandfordia	1807	Blandfordia: Blandfordiaceae: J.E. Smith Blandfordia: Diapensiaceae: H.C. Andrews	1804 1804	
gordonia	1833	Gordonia: Theaceae: J. Ellis	1770	
hibbertia	1805	Hibbertia: Dilleniaceae: H.C. Andrews	1800	
kennedya	1825	Kennedia [Kennedya]: Fabaceae: E.P. Ventenat	1805 [1825]	
lambertia	1804	Lambertia: Proteaceae: J.E. Smith	1798	
leea	1797	Leea: Leeaceae: C. Linnaeus	1767	
linnaea	1801	Linnaea: Caprifoliaceae: C. Linnaeus	1753	
nivenia	1802 •	Nivenia: Iridaceae: E.P. Ventenat Nivenia: Proteaceae: R. Brown	1808 1810	
pattersonia	1795	Pattersonia: Acanthaceae: J.F. Gmelin Patersonia: Iridaceae: R. Brown	1791 1807	
roxburghia	1825	Roxburghia: Olacaceae: W. Roxburgh	1795	
salisburia	post 1815	Salisburia [= Ginkgo]: Ginkgoaceae: J.E. Smith	1797	
solandra	1804	Solandra: Apiaceae: C. Linnaeus Solandra: Malvaceae: J.A. Murray Solandra: Solanaceae: O. Swartz	1759 1785 1787	
swainsonia	1809	Swainsona: Fabaceae: R.A. Salisbury	1806	
walkeria	1799	Walkeria: Nolanaceae: G.D. Ehret Walkeria: Sapotaceae: A. Chevalier	1763 1946	

In stark contract, the 'hardy' section of the database contains just 175 records (7%) comprising only a specific epithet in *Erica*, whereas more than 1 800 cultivar names (77%) are included (Nelson & Small 2000).

We cannot estimate the exact number of artificial hybrids that were named during the nineteenth century but it is incontrovertible that from the 1790s until at least the 1840s, some European horticulturists were adept at artificial pollination of Cape heaths and raising seedlings of hybrid origin. It is also clear that hybrids were often surreptitiously introduced into collections without their origins being recorded. Almost 1 600 names at the rank of variety are on record for African *Erica* species, and the vast majority of these were names given to plants raised in gardens—in this context the term variety is equivalent, in the majority of instances, to the modern term cultivar.

ACKNOWLEDGEMENTS

This paper arose from work carried out by the first author for the second volume of the *International register of heather names* which contains data on African species and their cultivars (Nelson & Small 2004). The research work for the register was funded jointly by The Heather Society and the Stanley Smith Horticultural Trust. Our thanks are due to Philip Oswald for translating crucial Latin texts.

REFERENCES

AITON, W. 1789. Hortus kewensis. Nicol, London.

AITON, W.T. 1811. Hortus kewensis, edn 2. Longman, Hurst, Reeves, London

ANDREWS, H.C. 1794— ± 1828. Coloured engravings of heaths. 4 volumes. The author, London.

ANDREWS, H.C. [post 1823]. Erica bauera [sic]. Coloured engravings of heaths, vol. 4: [t. 221].

ANDREWS, H.C. [± 1823]. Erica peltata. Coloured engravings of heaths, vol. 4: [t. 254].

ANON. 1879. Plant culture for market. The garden 15: 99.

BAKER, H.A. & OLIVER, E.G.H. 1968. Ericas in southern Africa. Purnell, Cape Town & Johannesburg.

BENTHAM, G. 1839. Erica. In A.-P. de Candolle, Prodromus systematis naturalis regni vegetabilis, vol. 7, 2: 614–693. Treuttel & Würtz, Paris.

BOWIE, J. 1826. Hints for the better cultivation of the Cape Heaths, derived from observations of their nature, soils, and situations. *The Gardener's Magazine* 1: 363–366.

BRADLOW, F.R. 1994. Francis Masson's account of three journeys at the Cape of Good Hope 1772–1775. Tablecloth Press, Cape Town.

CLEEVELY, R.J., NELSON, E.C. & OLIVER, E.G.H. 2003. More accurate publication dates for H.C. Andrews' *The Heathery*, particularly volumes 5 and 6. *Bothalia* 33: 195–198.

CLEEVELY, R.J. & OLIVER, E.G.H. 2002. A preliminary note of the publication dates of H.C. Andrews' Coloured engravings of heaths (1794–1830). Archives of natural history 29: 245–264.

CLUSIUS, C. 1605. Exoticorum libri decem. Plantin, Antwerp.

CLUSIUS, C. 1611. Curae porteriores, seu plurimarum non ante cognitarum, aut descriptarum stirpium. Plantin, Antwerp.

COATS, A.M. 1969. The quest for plants. A history of horticultural explorers. Studio Vista, London.

DESMOND, R.G.C. & ELLWOOD, C. 1994, Dictionary of British and Irish botanists and horticulturists. Revised edn. Taylor &

- Francis, & The Natural History Museum, London.
- *DEVONIAN', (A). 1849. Hybrid heaths. The Gardeners' Chronicle, 17 March 1849: 166.
- DONN, J. 1796. Hortus cantabrigiensis, or a catalogue of plants, indigenous and foreign cultivated in the Walkerian Botanic Garden, Cambridge. Donn, Cambridge.
- DULFER, H. 1964. Revision der s\u00fcdafrikanischen Arten der Gattung Erica L. 1, Teil. Annalen des Naturhistorischen Museums, Wien 68: 79-147.
- DULFER, H. 1965. Revision der s\u00fcdafrikanischen Arten der Gattung Erica L. 2. Teil Forsetzung von Ann. Bd. 67. Annalen des Naturhistorischen Museums, Wien 68: 25-177.
- ELLIOTT, W.B. 2001. Flora, an illustrated history of the garden flower. Scriptum-Cartago, London.
- ELLIOTT, W.B. 2004. The Royal Horticultural Society, a history 1804–2004. Phillimore, Chichester.
- GORDON, G. 1863. Hints for raising a hardy race of cross-bred heaths. Journal of horticulture and cottage gardening 4 (new ser.): 43, 44.
- GORER, R. 1978. The growth of gardens. Faber & Faber, London.
- GREUTER, W., McNEILL, J., BARRIE, F.R., BURDET, H.-M., DE-MOULIN, V., FILGUEIRA, T.S., NICOLSON, D.H., SILVA, P.C., SKOG, J.E., TREHANE, P., TURLAND, N.J. & HAWKSWORTH, D.L. (eds). 2000. International Code of Botanical Nomenclature (Saint Louis Code) adopted by the Sixteenth International Botanical Congress, St Louis, Missouri, July-August 1999. Regnum Vegetabile 138. Koeltz Scientific Books, Königstein.
- GUNN, M. & CODD, L.E. 1981. Botanical exploration of southern Africa. Balkema, Cape Town.
- GUTHRIE, F. & BOLUS, H. 1905. *Erica*. In W.T. Thistelton-Dyer, *Flora capensis* 4,1: 4–315. Reeve, London.
- HENREY, B. 1975. British botanical and horticultural literature before 1800. 3 volumes. Oxford University Press, London.
- HEPPER, F.N. (ed.). 1989. Royal Botanic Gardens Kew: gardens for science and pleasure. Her Majesty's Stationery Office, London.
- HERBERT, W. 1818. Instructions on the treatment of the Amaryllis longifolia ... with some observations on the production of hybrid plants. Transactions of the Horticultural Society of London 3: 187–196.
- HERBERT, W. 1837. On crosses and hybrid intermixture in vegetables. In *Amaryllidacea*: 335–380. Ridgway, London.
- HERBERT, W. 1847. On hybridization amongst vegetables. Journal of the Horticultural Society of London 2: 1–28, 81–107.
- HITCHCOCK, A. 2003. Erica verticillata is brought back from the brink of extinction. Yearbook of The Heather Society: 45–50.
- HOOKER, J.D. 1860. Archeria. The botany of the Antarctic voyage of H.M. Discovery ships Erebus and Terror in the years 1839–1843, vol. 3. Flora Tasmaniae part i: 262, t. 80, 81. Reeve, London.
- HOOKER, J.D. 1874. Erica chamissonis. Curtis's Botanical Magazine 100: t. 6108.
- JONES, A.W. 1988. A trip to Holland and Germany. Bulletin of The Heather Society 4, 4: 6–8.
- JOYNER, P. 1979. [South West Group news]. Bulletin of The Heather Society 2, 17: 5.
- KAY, S. 2003. Trying to create a garden in Connemara. Yearbook of The Heather Society 2003: 11–20.
- KERKHAM, A.S. 1988. Southern African botanical literature 1600–1988. South African Library, Cape Town.
- 'LANCASTRIAN', (A). 1849. Hardy heaths. The Gardeners' Chronicle 31 March 1849: 197, 198.
- LINDLEY, J. 1832. An introduction to botany. Longman, Rees, Orme, Brown, Green & Longman, London.
- LINNAEUS, C. 1738. Hortus cliffortianus. [sine nom.], Amsterdam.
- LINNAEUS, C. 1753. Species plantarum. Salvius, Stockholm.
- LINNAEUS, C. '1781' [1782]. Supplementum plantarum. Impensis orphanotrophei, Braunschweig.
- LODDIGES, C. 1804. Catalogue of plants. Loddiges, Hackney.
- LODDIGES, C. 1817–1833. The Botanical Cabinet. 20 volumes. Loddiges, Hackney.
- LODDIGES, C. 1821. Erica scholliana. The Botanical Cabinet 6: t. 538.
- E.M. (Name unknown), 1843, Review: Die Kultur und Aufzahlung der ... Eriken, by E. Regel. *The Gardeners' Chronicle* 14 January 1843: 24.
- McCLINTOCK, D.C. 1998. Erica *krameri*: the hybrid between E. carnea and E. spiculifolia. Yearbook of The Heather Society 1998: 26.

- McCLINTOCK, D.C. 1999. Cape heaths crossed with European species. *The New Plantsman* 6, 4: 207.
- McNAB, W. 1832. A treatise on the propagation, cultivation, and general treatment of Cape heaths, in a climate where they require protection during the winter months. Thomas Clark, Edinburgh.
- MARTYN, T. '1807'. Erica. In The gardener's and botanist's dictionary ... by the late Philip Miller Volume I, part II (Cla-I). Rivington, London. [Although the title-page is dated 1807, there is evidence (Nelson 2004) that portions of this part were issued at least a decade earlier.]
- MASSON, F. 1776. An account of three journeys from Cape Town into the southern parts of Africa. *Philosophical transactions of the Royal Society* 66: 268–316. [Reprinted in Bradlow (1994): 103–135.]
- MAUND, B. & HENSLOW, J. S. 1839. Erica pseudovestita. The Botanist 3: t. 104.
- MONTIN, L.J. 1774. Erica thunbergii. Nova acta Regiae Societatis Scientiarum Upsalensis 2: 290–292.
- NELSON, E.C. 2004. Publication dates of (early) parts of Thomas Martyn's edition of Philip Miller's Gardener's and botanist's dictionary. Society for the History of Natural History newsletter No. 79: 16, 17.
- NELSON, E.C. & McCRACKEN, E.M. 1987. The brightest jewel. A history of the National Botanic Gardens, Glasnevin, Dublin. Boethius Press, Kilkenny.
- NELSON, E.C. & OLIVER, E.G.H. 2003. Understanding Erica xwill-morei, a nineteenth century English garden hybrid. Bothalia 33: 149–154.
- NELSON, E.C. & ROURKE, J.P. 1993. James Niven (1776–1827), a Scottish botanical collector at the Cape of Good Hope: his hortus siccus at the National Botanic Gardens, Glasnevin, Dublin (DBN), and the Royal Botanic Gardens, Kew (K). Kew Bulletin 48: 663–682.
- NELSON, E.C. & SCARBROUGH, Earl of. 2003. Erica savileae, the Countess of Scarbrough's heath: a mystery resolved? Yearbook of The Heather Society 2003: 31–36.
- NELSON, E.C. & SMALL, D.J. (eds). 2000. International register of heather names. Volume 1 [in 4 parts] Hardy cultivars and European species. The Heather Society, Creeting St Mary.
- NELSON, E.C. & SMALL, D.J. (eds). 2004. International register of heather names. Volume 2 [in 4 parts] African species, hybrids and cultivars. The Heather Society, Creeting St Mary.
- OLIVER, E.G.H. 2000. Systematics of Ericeae (Ericaceae: Ericoideae) species with indehiscent and partially dehiscent fruits. Contributions from the Bolus Herbarium No. 19.
- OLIVER, E.G.H. 2003. Footnote [to Hitchcock (2003)]. Yearbook of The Heather Society 2003: 50.
- OLIVER, E.G.H. & OLIVER, I.M. 2002. The genus *Erica* (Ericaceae) in southern Africa. *Bothalia* 32: 37–61.
- OLIVER, E.G.H. & OLIVER, I.M. 2003. Ericaceae. Strelitzia 14: 424-451.
- OLIVER, I. & OLIVER, E.G.H. 2000. Ericas of the Cape Peninsula. Protea Atlas Project, National Botanical Institute, Cape Town.
- PAXTON, J. 1844. Erica murrayana. Magazine of Botany 11: 77, 78.
- PLUKENET, L. 1700. Almagesti botanici mantissa. The author, London.
- REGEL, E. 1842. Die Kultur und Aufzahlung der ... Eriken. Verhandlungen des Vereins zur Beförderung des Gartenbaues in den Königlich Preußischen Staaten 16: 221–331.
- ROLLISSON, G. 1843. Hybrid plants. *The Gardeners' Chronicle* 8 July: 461.
- ROLLISSON, Messrs. 1826a. Ericas in flower from October 1st to November 26th, in the Tooting Nursery. The Gardener's Magazine 1: 88.
- ROLLISSON, Messrs. 1826b. List of Cape heaths which have been in flower in the Tooting Nursery in each month of the year. *The Gardener's Magazine* 1: 366–375.
- ROURKE, J. 1980. The proteas of southern Africa. Purnell, Cape Town.
- SALISBURY, R.A. 1796. Prodromus stirpium in horto ad Chapel Allerton vigentium. The author, London.
- SALISBURY, R.A. 1802. Species of Erica. Transactions of the Linnean Society 6: 316–388.
- SCHUMANN, D., KIRSTEN, G. & OLIVER, E.G.H. 1992. Ericas of South Africa. Fernwood Press, Vlaeberg.
- SEBA, A. 1734(-1765). Locupletissimi rerum naturalium, Jannson-Waesberg, Amsterdam.

- SMITH, J.E. 1809. Erica. In A. Rees, The Cyclopaedia. Longman, Hurst, Rees, Orme & Brown, London.
- STEARN, W.T. 1952. William Herbert's 'Appendix' and 'Amarylli-daceae'. Journal of the Society for the Bibliography of Natural History 2: 375–377.
- STEARN, W.T. 1973. Botanical Latin. History, grammar, syntax, terminology and vocabulary, edn 2. David & Charles, Newton Abbot
- STORY, W.H. 1848. Seedling heaths. The Florist 1848: 314-316.
- THUNBERG, C.P. 1785. D. D. dissertatio botanica de Erica. Edman, Uppsala.
- VENTENAT, E.P. 1808. Nivenia. Decas generum novorum. Dufarb,

- WATSON, W. 1892. Plant notes. Erica hyemalis. Garden and Forest 5: 136-138
- WIJNANDS, D.O. 1983. The botany of the Commelins. A taxonomical, nomenclatural and historical account of the plants depicted in the Moninckx atlas and in the four books by Jan and Caspar Commelin on the plants in the Hortus Medicus Amstelodamensis 1682–1710. Balkema, Rotterdam.
- WILLDENOW, C.L. 1809. Enumeratio plantarum horti regii botanici berolinensi. Taberna Libraria Scholae Realis, Berlin.
- WILLSON, E.J. 1961. James Lee and the Vineyard Nursery Hammersmith. Hammersmith Local History Group, London.
- WRIGHT, S.J. & NELSON, E.C. 2004. Diana of the heathers. Heathers (Yearbook of The Heather Society) 1: 42–51.

APPENDIX 1.—'List of Erica's not in Your List of Hort. Kew.'

The series of 'Inwards Books' recording plants received at the Royal (Botanic) Gardens, Kew, provides some fascinating information about the development of the Kew collections. A letter, dated 24 October 1808 ('Inwards Book', f. 259), from Messrs Lee & Kennedy of Hammersmith, London, evidently was a response to a request, probably from William T. Aiton, for lists of plants that the nursery had introduced. While not explicit in the letter it is possible that this list was sought by Aiton as he then would have been preparing the second edition of *Hortus kewensis* (1811). Lee & Kennedy explained that 'Our busy Season is come upon us and we are not able to accomplish the List you desire of what we have introduced into this Country ...'. However, they did furnish this '... List of Erica's not in Your List of Hort. Kew.' ('Inwards Book', ff 262, 263). [* All the names following consimilis are bracketed by these dates.]

[f 262, left column]	[f 262, right column]	[f 263, left column]	[f 263, right column]
Erica Bandania [sic. =	Erica Lychnidia	Erica Smithiana	Erica laxa
bandonia] 1802	Lawsonia	trivialis	campestris
Cistifolia 1803	leucanthera	tabulare	complanata
DeCliffordia 1802	lactea	tenuiflora	spiralis
Concava 1800	lucida	transparens	finitima
Coventrya 1803	mundula	trossula	florida
consimilis 1800 to 1808*	monstrosa	triceps	Carneola
cumulata	melanthera	turgida	imbuta
Constantia	odorerosea	Thunbergia	villosiuscula
dilecta	oppositifolia	Thalictroides	tricolor
Daphneoides	biflora	vernix	sanguinolenta
Dickinsoniana	tenuiflora	venusta	millifera
exserta	ovata	vegeta	florabunda
erubescens	pallens	congesta	virgata
epistomia	perlatus	ocularea	scabriuscula
fimbriata	pistillaris	bicolor	picta
flaccida	præstans	Saturgifolia	deflexa
fusca	pomifera	Blandfordia	bergiana
fibula	proboscidea	acutangula	decora
gemmifera	pura	axillaris	sulphurea
globosa	præcox	Shannonia	obcordata
Humea	racemiflora	demisa	oblata
imperialis	reflexa	Donnea	crinita
infundibuliforme	rostella	Savillea	
intertexta	setacea		
Kalmiflora			
lanuginosa			

APPENDIX 2.—Epithets in Erica published before 1835 commemorating individuals

Article 61 of the International Code of Botanical Nomenclature (St Louis) (Greuter *et al.* 2000) applies to orthographic variants that are based on one nomenclatural type. Article 61.2 states that 'For the purpose of this Code, orthographical variants are the various spelling, compounding, and inflectional forms of a name or its epithet (including typographical errors), only one nomenclatural type being involved.' Article 61.3 states that 'If orthographical variants of a name appear in the original publication, the one that conforms to the rules and best suits the recommendations of Art. 60 is to be retained; otherwise the first author who, in an effectively published text ..., explicitly adopts one of the variants and rejects the other(s) must be followed'.

The identities of the persons commemorated in the eponyms listed below may differ from those published in other sources [e.g. Schumann *et al.* (1992), and miscellaneous lists published in issues of the *Yearbook of The Heather Society*]. The names (and aristocratic titles) given below have been determined by ECN, by careful comparison of protologues with biographical details of the individuals concerned.

Eponym: earliest valid variant, author, year of publication	Person commemorated, dates if known	Orthographic variants	Correct orthography
aitonia F. Masson ex H.C. Andrews,	William Aiton (1731–1793)	aitoni, aitonii, aitoniana, aitonianum, aytoni	aitonii
andrewsiana J.F. Tausch, 1834	Henry Charles Andrews (fl. 1790–1830)	-	andrewsiana
andrewsii J.F. Klotzsch, 1836 non hort., 1856	Henry Charles Andrews (fl. 1790–1830)	-	andrewsii
archeria H.C. Andrews, 1803	Sarah, Lady Archer (1741–1801) (née West)	archeri, archeriana	archerae
bandonia H.C. Andrews, post 1814	Francis Bernard (1755–1830), 1st Earl of Bandon	bandoniana	bandonii
banksia H.C. Andrews, 1797	Sir Joseph Banks (1743–1820)	banksiana, banksii	banksii
hauera H.C. Andrews, post 1823	Franz (Francis) Andreas Bauer (1758–1840)	bauerea, baueria, baueriana, baurea, bowerii	baueri
beaumontia H.C. Andrews, post 1828	Mrs Diana Beaumont (1765–1831) (née Wordsworth)	beaumontiana	beaumontiae (see Wright & Nelson 2004)
bedfordiana J.C. Loudon, 1830	John Russell, 6th Duke of Bedford (1766–1839): see also <i>russelliana</i>	bedfortiana	bedfordiana
bergiana C. Linnaeus, 1770	Peter Jonas Bergius (1730-1790)	_	bergiana
blandfordia H.C. Andrews, 1807	George Spencer Churchill (1766–1840), Marquis of Blandford (later Duke of Marlborough).	blandfordiae, blandfordiana, blanfordia, blanfordiana	blandfordii
bonplandiana J. Sims, 1820	Aimé Jacques Alexandre Bonpland (1773–1858) (née Goujard)	bonblandiana, bonplandia, bonplandiana	bonplandiana
howieana C. Loddiges, 1824	James Bowie (± 1789–1869).	bovieana, boweana, bowei, boweiana, bowerii, bowia, bowiana, bowiei, bowienana, bowii	bowieana
broadleyana H.C. Andrews, 1809	most probably Mrs Eliza Broadley (fl. 1812) (cf Geranium [i.e. Pelargonium broadleyae]	_	broadleyana
cassonii G. Sinclair, 1825	? Casson (1796–1886)	_	cassonii
celsiana J.C. Loudon, 1826	? François Cels (1771–1831)	celsii	celsiana
cliffordiana C. Loddiges, 1817	Sophia, Baroness de Clifford (1743–1828)	cliffordi , cliffordia , cliffortia , clif- fortiana , clifordiana , decliffor- dia (De Cliffordia)	cliffordiana
comptoniana H.C. Andrews, post 1815	Maria, Countess of Northampton (b. 1767) (née Smith)	_	comptoniana
coventrya H.C. Andrews, ± 1816	George William (1722–1809), 6th Earl of Coventry.	coventria, coventriana, coventryana	coventryi
dickensonia G. Sinclair, 1825	? Revd Samuel Dickenson (1733– 1823)	dickensonia, dickensoniana, dickensonii, dickinsoni, dicksonia, dicksoniana	dickensonii
ewerana J. Dryander, 1811	William Ewer (fl. 1800)	everana, eweri, ewerana, eweriana, ewersiana, ewery, eworana, uharia, uhria	eweriana = uhrii
gordonia J. Forbes,1833	Lady Georgina Gordon (± 1783– 1853), Duchess of Bedford, second wife of the 6th Duke.	gordinia	gordoniae
hibbertia H.C. Andrews, 1805	George Hibbert (1757–1837)	hibberdia, hibbertiana, hibbertii, hibertia	hîbbertii
humeana C. Loddiges, 1819	Sir Abraham Hume Bt (1748/9– 1838)	humea .	humeana

Eponym: earliest valid variant, author, year of publication	Person commemorated, dates if known	Orthographic variants	Correct orthography
rbyana H.C. Andrews, 1809	The Hon. William Henry Irby (fl. 1800–1810)	-10.200	irbyana
ennedya hort. ex G. Sinclair, 1825	John Kennedy (1759–1842)	kennedia	kennedyi
ambertia H.C. Andrews, 1804	Aylmer Bourke Lambert (1761–1842)	lambertiana (may be a distinct ?taxon)	lambertii
awsonii J. Sims, 1815	Sir Wilfred Lawson Bt (d. 1806)	lawsonia, lawsoniana	lawsonii
rea H.C. Andrews, 1797	James Lee (1715-1795)	leeana, leeiana	leei
nnaea H.C. Andrews, 1801	Carl Linnaeus (1707-1783)	linnaeana, linnaei	linnaei
nassonii C. Linnaeus f., 1782	Francis Masson (1741–1805)	massconi, massoni, massonia,	massonii
nonsoniana C. Linnaeus f., 1782	Lady Ann Monson (± 1714–1776)	massoniana monsoncana, monsonia, monsoniae,	monsoniana
inania II C. Androne 1903	Iomas Nivan (1776, 1929)	monsonis niveni, niveniana	nivenii
ivenia H.C. Andrews, 1802	James Niven (1776–1828)		
armentierii C. Loddiges, 1818	Joseph Parmentier of Enghlen	parmenteriana, parmentiana, par- mentiera, parmentieri, parmen- tieria, parmentieriana, parmien- tiera	parmentieri
attersonia H.C. Andrews, 1795	William Paterson (1755–1810)	patersoni, patersoniana, patersonii, pattersonny,	patersonii
petiveri C. Linnaeus, 1770	James Petiver (1663/4–1718)	petivera, petiveria, petivieriana, petiverii, petivorii	petiveri
olukenetii C. Linnaeus, 1753	Leonard Plukenet (1642–1706)	pluckenetia, pluckenetii, plucknetii, plukeneti, plukenetia, plukenetia- na, pluknetiana, pluknetii	plukenetii
pohlmanni C. Loddiges, 1832	Peter Hienrich Pohlmann (olim Polemann) (d. 1839)	pohlmannii	pohlmannii
oxburghia G. Sinclair, 1825	William (1751–1815), or John (fl. 1777–1817) Roxburgh	roxburghii, roxburgia	roxburghii
usselliana G. Sinclair, 1825, or russeliana H.C. Andrews, post 1824	John Russell (1766–1839), 6th Duke of Bedford: see also <i>bedfordia</i>	russeliana	russelliana
ainsburyana H.C. Andrews, post 1814	Miss Sainsbury	sainsburiana, sainsburya	sainsburyana
alisburia H.C. Andrews, post 1815	Richard Anthony Salisbury (1761–1829) (né Markham)	salisburya, salisburyana	salishurii
anderi J.E. Reider, 1829	? Sander	_	sanderi
avileia H.C. Andrews, 1809	Henrietta Lumley Savile (1766– 1846) (née Willoughby), Countess of Scarbrough	savilea, savileana, saviliana, savilii, savillae, savillea, savilleae, savil- leana, savillei, savilleia, savilliae, savilliana, savillii, savilloea	savileae (see Nelson & Scarbrough 2003)
cholliana C. Loddiges, 1804	Georg Scholl (fl. 1790s)	schollii	scholliana
ebana F.A. Bauer, 1796	Albertus Seba (1665–1736)	_	sebana
thannonea H.C. Andrews, post 1814	Henry Boyle (1771–1842), 3rd Earl of Shannon	shannoneana, shannoni, shannonia, shannoniae, shannoniana, shan- nonii	shannonii
mithiana G. Sinclair, 1825	Sir James Edward Smith (1759–1828)	smithii	smithiana
olandra H.C. Andrews, 1804	Daniel Carlsson Solander (1736–1782.	solanaria, solandri, solandria, solandriana	solandri
parrmanii C. Linnaeus f., 1778	Anders Sparrman (1748–1820)	spaarmanni, sparmanni, sparmannia, sparrmanni, sparrmannii	sparrmanii
wainsonia H.C. Andrews, 1809	? Dr Isaac Swainson (1746–1812), of Twickenham	swainsoni, swainsoniana	swainsonii
emplea H.C. Andrews, post 1824	Lady Temple; possibly the wife of Richard, 2nd Marquess of Buckingham.	templaea, templeae, templeana, templeii	templeae
hunbergii L.J. Montin, 1775	Carl Pehr Thunberg (1743–1828)	thunbergia	thunbergii
uhria H.C. Andrews, 1802	? William Ewer (qv eweri), unless after someone named Uhr	everana, ewerana, eweri, eweriana, ewersiana, ewery, eworana, uharia, uhria	uhrii = eweriana
walkeria H.C. Andrews, 1799	? Joseph Walker of Liverpool	walkeri, walkeriana, walkerii	walkeri
wendlandiana J.F. Klotzsch, 1825	Johann Christoph Wendland (1755–1828)	wendlandii	wendlandiana
zevheri A. Sprengel, 1828	Karl Ludwig Philipp Zeyher		zeyheri