

HUNTIA

A Journal of Botanical History



Volume 5 Number 2
September 1984

Hunt Institute for Botanical Documentation
Carnegie-Mellon University
Pittsburgh

Huntia is published irregularly, in one or more numbers per volume of approximately 200 pages, by the Hunt Institute for Botanical Documentation, Carnegie-Mellon University, Pittsburgh, PA 15213.

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Subscription rate is \$25.00 per volume. Associates of Hunt Institute may elect to receive *Huntia* as a benefit of membership.

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Orders from North America for subscriptions and back issues should be sent to the Institute; from elsewhere, to Wheldon & Wesley, Ltd., Lytton Lodge, Codicote, Hitchin, Herts. SG4 8TE England.

Typography by InfoComp, Inc., Pittsburgh

Graphics coordination by
The Peter J. Waterkotte Co., Pittsburgh

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ISSN 0073-4071

Reviews

Addicott, Frederick T. *Abscission*. Berkeley: University of California Press, 1982. xviii, 369 pp., illus. \$39.50. ISBN 0-520-04288-3.

Thirty-two years of the author's own research undergird this comprehensive treatise on abscission in plants both higher and lower, extinct and extant. Lucid, detailed discussions of physiological, biochemical, ultrastructural, ecological, genetic and anatomical phenomena precede a fascinating review of paleontology and evolution. With an impressive bibliography and superior illustrations (including many admirable drawings by Alice B. Addicott), this well-designed volume will surely be the starting-point for future studies of abscission. As well, it should prove both interesting and stimulating to all those concerned generally with the evolution of plant structure and function.

T.D. Jacobsen
Hunt Institute

Benson, Lyman. *The Cacti of the United States and Canada*. Stanford: Stanford University Press, 1982. 1044 pp., 194 color illus. (on 48 plates), 947 black and white text figs. \$85.00. ISBN 0-8047-0863-0.

At a time when the reading public is constantly entreated to purchase what the publishers style "Great," "Complete," "Comprehensive," "Pictorial" and other kinds of so-called "Encyclopaedias" covering all aspects of natural history, horticulture and decorative plant keeping, it is immensely pleasing to greet the appearance of a truly encyclopaedic work. Eschewing deafening claims for its magnitude or comprehensiveness, *The Cacti of the United States and Canada* is an unpretentiously labelled thousand-page treatise (with an even greater number of illustrations) which seeks to "make available to the public the results of 48 years research upon the genera and species of cacti native or introduced" to North America.

The whole work breathes that air of modesty and mature awareness of the limit of any man's knowledge which is bred of prolonged scholarship.

Lyman Benson, Emeritus Professor of Botany at Pomona College, Claremont, California, collected his first cacti in 1929 and shortly afterward developed a serious interest in the group. This led to his *Cacti of Arizona* (1940), which reached a third edition in 1969, and to contributions on the Cactaceae in Lundell et al., *Flora of Texas* (1970) and in Correll and Johnson, *Manual of the vascular plants of Texas* (1970). He has also contributed numerous scientific articles on cactus nomenclature, taxonomy and conservation. To countless students and professional botanists he became known for his texts, *Plant classification* (1957, 1979) and *Plant taxonomy* (1962). The extent of his journeyings throughout North America seeking cacti and other plants must make him one of America's best-travelled naturalists and a candidate for some of the reverence usually reserved for the pioneer explorer-naturalists. The extent of his field studies in the United States is demonstrated by the map he provides on page 100 of this work.

With refreshingly clear and direct prose Benson presents a treatise on cacti for the public ("public," he explains, "is used here in the broadest sense to include all who are interested in cactus plants — from botanical specialists and ecologists to naturalists, horticulturists, hobbyists, ranchers, and those with only a casual interest in recognizing a species or two"), putting "what is known into order and perspective." As the book's size alone would suggest, quite a lot is known to Benson and others, and presenting this corpus of knowledge in a manner and form that are both technically competent and popularly comprehensible, as well as attractive, demonstrates Benson's skill as botanist, teacher and documentalist, not to mention draughtsman and photographer.

The core of the book is a 660-page systematic treatise on 152 species of cacti, including their varieties, arranged within a conservative 18 genera — a marked reduction from the 33 accepted by Britton and Rose in

their *Cactaceae* (1919-1923). A preliminary key leads the reader to individual genera, and the text is liberally provided with keys to species and infraspecific categories. Individual species descriptions follow a regular presentation treating the whole plant, the vegetative parts, the flower, the fruit and seeds. The needs and likely aptitudes of Benson's various "public" are well catered for in a text that makes no unnecessary concessions to the non-specialist. His botanical text is packed with technical information but presented with minimal use of abstruse terminology and supported with such a wealth of illustration that scarcely any feature in his descriptions cannot be clarified by reference to impressively vivid photographs and studiously careful drawings. His introductory notes take the non-specialist through the technicalities of presentation and provide a simple lesson in the use of keys.

The illustrations are such an important feature of the volume that they merit special comment. The bulk of the drawings are the product of Lucretia B. Hamilton's skillful and experienced pen, mostly drawn from live material and shown to excellent effect in scores of full-page illustrations. But a goodly number are the work of the author, drawn in a less robust style that shares much of the exquisite polish and refinement of Paulus Roetter's illustrations for Engelmann's classic *Cactaceae in the Boundary* in Emory's report of the U.S. and Mexican Boundary Survey (1859). Some 15 of Roetter's plates are reproduced with exceptional clarity in the present work. The greater portion of the 947 text-figures are photographs, most of them taken by the author. Those are supplemented by the work of David Griffiths and various other botanist-photographers. In addition to this great array of monochrome photos there are 194 in colour, arranged in three sections of plates. Much thought and care in selection are reflected in this gallery of photo-illustrations, which show fine details of morphology, explicit features of habitat and general characteristics of environment to best effect. The photographs shot in artificial lighting are more vivid than most of the field photos, for indoor conditions allow the use of carefully angled and modulated light sources to throw characteristic forms and textures into clearest view. The field photos, though, are none the less valuable, and the legends for all the photos and drawings have been carefully composed so as to draw attention to significant features of structure, habit and environment, serving to supplement the main text. Both the trained botanist and the curious amateur will derive much value from this extensive and carefully presented graphic documentation.

The text provides full and authoritative discussion of geographical distributions, often based on personal exploration, and the narrative for almost every species is supplemented by a dot map. The author has been careful to base distribution statements only on data recorded on herbarium specimens. He explains that "Field observation could add much to what is on the maps, but this is not recorded because it depends too much on memory and judgement and because it is not subject to a direct check by another individual." Such assiduous attention to the accuracy of his documentation is found throughout the whole work and provides an example in method that should be seriously taken to heart by many who are all too ready to sketch distribution maps based on an unhealthy proportion of supposition or intuition!

Further documentation is provided by citing specimens in herbaria at home and abroad, most of them seen by the author. So extensive is this information that most of it is relegated to a supplementary 60-page data section following the main text, thereby freeing Benson's narrative of much specialist matter that will be of interest to only a limited portion of his audience. This section "documents the research underlying classification, ... nomenclature, ... and geographical distribution," and the data are presented in a classified arrangement which mirrors that employed in the main text. For reasons that are not explained, the publisher has chosen to present this section as a graceless photo-facsimile of a typescript, much reduced, and its strikingly inferior legibility is barely acceptable.

The species descriptions are replete with tabular taxonomic data and discussion of the work of other students of the cacti. They draw attention to an impressive body of general knowledge on the natural history of the plants in the wild, as well as comment on the horticultural aspects of many species. There is much critical discussion on the present state of taxonomic knowledge in relation to imperfectly understood genera, and of varying opinions on the treatment of certain disputed taxa. A bibliography of some 950 works cited in the text indicates the extent of background reading.

Part 1 of this treatise is a series of chapters on the biology of cacti which cover structure, physiology (contributed by F. W. Went), chemical characters (with materials contributed by D. L. Walkington and B. S. Bean), geographical distribution and the environment, uses of cacti and conservation. In addition there are chapters on the family and the order, on the family and the genera and species, and on varieties and hybrids, together with a note on classification

policy and a description of field and herbarium methods. Whilst the professional botanist will surely derive much useful information from this broad survey of cactus biology, it is the non-specialist in particular who will value the thorough, uncomplicated presentation of all that is necessary for a general understanding of the nature of cacti, their botanical features, and the bases for the classification set out in Part 2 of the work. A final and most remarkable introductory chapter — 80 pages on floras and floristic associations of North America, with 85 photographs — is almost a textbook in its own right.

In addition to his heartfelt comments on conservation, Benson has done further service to the protection of certain rare, threatened or endangered taxa by withholding precise localities from his text, though it pains him as a scientist thus to restrict the free dissemination of scientific data.

A copious glossary defines a wide range of general botanical terms, which should assist the non-specialist; as well, it clarifies the use of many special terms which describe features peculiar to cacti. The book concludes with a series of reference maps and a thorough general index.

The publisher has gone to much trouble to present the author's treatise and illustrations sharply printed on good white paper which, though thin, has little noticeable see-through. The colour plates are printed on a matte heavier-weight paper and, so far as a non-specialist can judge, provide accurate rendition of hues and tones. The designer has taken some chances with layout, such as with the landscape orientation of the table on pages 112/113, which flows into and out of the gutter, making it difficult to read, and with illustrations such as that on page 278 which sometimes run far into the inner margin. Fortunately the book is sewn and can be opened wide at these places without too much fear of damage. However, considering the size and weight of this volume, the binding case is grossly inadequate. If the book receives much handling — and many copies surely will, especially in libraries — it will probably need repair before many months have passed. At \$85 it is not targeted at the casual buyer, and anyone who feels sufficient interest to pay the price for this magnificent treatise surely would have been willing to pay a little more and have it in a durable binding.

Professor Benson is to be congratulated on the superb content and presentation of a landmark work, obviously one nurtured and refined over many years. With characteristic modesty he states that "A definitive monograph of the family is needed, but the underlying research may require a century or more.

This book is intended to be a beginning in this direction, but it is only a first step." This mature "first step" must become a classic in itself, and the author's renown will surely grow ever wider as the full "public" to whom his scholarship is now so accessible come to know and appreciate its breadth, depth and accuracy. As a work of botanical documentation it will certainly be appreciated by both specialist and non-specialist librarians once they discover the wealth of data it contains, the clarity of presentation, and the ease with which information can be retrieved from text and illustrations. One hopes that they will acquire this work rather than be seduced by the blandishments of more extravagantly titled but vastly inferior ones, including those with more florid but less informative and well documented illustrations. A great many botanists and cactus enthusiasts will want to possess their own copies and will not regret the struggle to save up the cost of purchase. We must be grateful that Stanford University Press have seen fit to add this impressive taxonomic treatise to their growing list of such works, including the similarly noteworthy floras of Alaska and the Galapagos.

Gavin D. R. Bridson
Hunt Institute

Crowell, Robert L. *The lore & legends of flowers.* New York: Thomas Y. Crowell, 1982. 80 pp., 24 col. pls. \$14.50. ISBN 0-690-03991-3.

Brief, readable chapters on tulips, narcissi, crocuses, irises, carnations, roses, nasturtiums, dandelions, marigolds and dahlias provide interesting information about their history, legends and lore. The reader learns, for instance, that the "pinked" (zig-zag) apex of the carnation petal gave rise to the name for that flower's characteristic color; that the Yellow Flag (*Iris pseudacorus*) inspired the *fleur-de-lis* of Louis VII's blazon; and that in Henry VIII's court saffron was esteemed for coloring hair blonde and disguising tainted food.

Anne Ophelia Dowden, one of America's leading botanical artists, has provided attractive illustrations which, together with Mr. Crowell's text, make an appealing and satisfying book.

James J. White
Hunt Institute

Roche, Gisèle de la, Gordon D. Rowley, André Lawalrée and William T. Stearn. *Commentaries to Les roses by P. J. Redouté. [A contribution to the history of the genus Rosa.* Antwerp: De Schutter, 1978. 387 pp., illustr., 11 pl. (most in color). (Parallel texts in French and English.) ISBN 2-8023-0004-0.

De Schutter's recent facsimile edition of the folio *Les roses* (Paris, 1817-1824) is enhanced by this fourth volume devoted entirely to bio-bibliographic essays on Redouté, Thory and other 19th- and 20th-century rosarians, and to a substantial taxonomic and horticultural survey of the roses that Redouté painted. This latter contribution, by the Baroness Gisèle de la Roche, represents her valiant effort to record the research of a lifetime while living out a terminal illness. The other essays were added at her request.

Sir George Taylor introduces this supplementary volume by delineating the virtues and vices of roses for both biologist and artist. He then discusses the origin of De Schutter's handsome edition (the three facsimile volumes were published 1974-1976), applauds the commentaries and supplies some biographical information on each of the essayists. Rowley succinctly lists the major problems in identifying the roses known to Redouté and Thory — problems traceable to "artistic licence in painting the portraits, and technical shortcomings in mass-reproducing them." He notes discrepancies between the text and the plates, suggesting that they may owe to pressure on Redouté to idealize the plants. Lawalrée offers two satisfying, informative essays. The first recounts the quasi-happy life of the "Raphael of the Roses," who eschewed the prevalent faults of flower painters, which he itemized as "inaccuracy, stiffness and monotony." The second attends to the life of Claude Antoine Thory (1759-1827), whose interests included the history of Freemasonry in France as well as the culture and taxonomy of *Ribes* and *Rosa*. Although comparatively short, this essay is an admirable attempt to focus attention on one whose work has always been eclipsed by Redouté's. Two portraits of Redouté and one of Thory are reproduced from lithographs. The entries in Lawalrée's "Works published or illustrated by Pierre-Joseph Redouté" include extensive comments on part-publication dates, but the citation format is awkward and one wishes for more specific bibliographic information.

Though de la Roche considers only roses painted by Redouté, her detailed histories of each are so thorough, discussing synonymy, nomenclatural difficulties, confusion in sub-groupings, and spontaneous forms and cultivars, that they often provide knowledge of much else in the genus as well. Unfortu-

nately, although these discussions evidence a close reading of much primary material, many are overly discursive and the potentially important taxonomic portions are often blurred in horticultural emotion.

Stearn assists the botanical rosarian by reprinting descriptions of nine species from the rare *De Rosa* by Johann Hermann (1738-1800). He goes on to survey the lives and accomplishments of various rosarians, emphasizing John Lindley's (1799-1865) introduction to *Rosarium monographia* and the initial studies of rose cytology and cytogenetics by Gunnar V. Täckholm (1891-1933) and by Charles C. Hurst (1870-1947) respectively.

The reproductions in this volume fall short in color balance and definition, and are particularly disappointing when compared with the original stipple engravings. The list of plates is confusing. The caption associated (only) with Plate 4 ("Additional plates by Redouté for *Les roses*, third edition:") actually applies to Plates 4 through 7, and the explanation of Plates 8 through 11 could have made clearer that these four illustrations are from *Le bouquet royal*.

The decision to produce the commentary volume on the same grand scale as the facsimile is unfortunate, since that will effectively deprive many in its diverse potential audience — botanists, bibliographers, art historians, horticulturists, book collectors — of access to its considerable valuable content. Indeed, if the whole production was intended to be an optimal vehicle for Baroness de la Roche's expertise, and a scholarly asset, octavo volumes would have been far preferable — much more affordable, better suited to the quality of plate reproduction, and eminently more practical for the use that the text especially could command. Even when the work is available in a library collection, having to manipulate the unwieldy folio pages will deter extensive use. All purchasers will do well to leave the facsimile in loose plates, in portfolio, and supply a lectern for the commentary volume.

Michael T. Stieber, James J. White, Elizabeth A. Mosimann and Bernadette G. Callery
Hunt Institute

Duval, Marguerite. *The king's garden.* Translated by Amette Tomarken and Claudine Cowen. Charlottesville: University Press of Virginia, 1982. 256 pp., illustr. \$14.95. ISBN 0-8139-0916-3.

One cannot read *The king's garden* without enjoying it, and the credit for that is due both the author and her

translators. In this popular account Duval details the exploits of several botanical explorers from *La Belle France*, inspiring admiration for their enrichment of that country's floral treasury.

Duval leads one on forced marches through the Levant, first with Pierre Belon and later with Joseph Pitton de Tournefort, the former being dubbed the first "botanist-traveller" for France, the latter needing no introduction to anyone passingly familiar with botanical history. She then surveys the development of the 16th- and 17th-century Gallic zeal for plants from other lands, citing as its font the University of Montpellier, whose Faculty of Medicine had been established in 1141. While discussing the foundation of that institution's botanical garden, Duval asserts that the tradition of botany begun there by Jean Ruel's translation of the work of Dioscorides based itself upon the principle that one should observe plants in the field. This practice begun by Theophrastus some 300 years before Christ and continued by Dioscorides in the first century A.D., she claims, was abandoned by naturalists in the Middle Ages. These people were only "busy with their pharmaceutical equations" or, she continues, would discourse "endlessly about dried flowers." But it seems to me that Albertus Magnus, among others, devoted many years to studying living plants at the height of the Middle Ages, the 13th century, and managed to identify "the basic types of floral forms and fruits ... recognizing the functions of the sap and the structure of seeds, fruits, and flowers" (Goldstein, 1980, p. 152). This quibble notwithstanding, it is evident that field explorations by the king's gardeners increased significantly during the 16th and 17th centuries, prompted in large measure by political exigencies as well as the commercial and medicinal desiderata of the French citizenry. One of the major problems encountered by these collectors was how to acclimatize their exotics to France, and Duval discusses its importance for those working at the main import stations, the gardens at Montpellier, Nantes and Paris. In an appendix she lists French arboreta and botanical gardens which today still do that kind of work.

Duval does not neglect the tragedy that befell many of the "botanist-travellers." For example, she recounts the misfortunes of Joseph de Jussieu, brother of one of the king's (and botany's) chief gardeners, who enthusiastically began to explore Martinique in 1735, moved on and eventually became stranded in the Andes for nearly 35 years. He returned home at last in 1771, a broken man to an unfamiliar country, his crates containing "the treasures accumulated through years of incredible exploration" lost. He finally died never having written a word about the

South American flora, never having regained his reason, never having ventured even outdoors during his last eight years.

Other unfortunates included Pierre Belon, who was murdered in the Bois du Boulogne after having survived the perhaps equal dangers of Turks and Levantine diseases and topography. Tournefort also ran the eastern Mediterranean gauntlet successfully, only to expire under the wheels of a physician's carriage in a Parisian street, as attested by a fine contemporary engraving reproduced by Duval. André Michaux, after what could be called a successful tour of the eastern United States that resulted in his *Flora Boreali-Americana*, the first flora of that part of North America, left France on the Boudin expedition to Australia in 1801, only to disembark at Mauritius. There he built a cabin and began a floristic analysis of the island, but died within a year, probably the victim of some fever. Utterly destitute, Aimé Bonpland passed away peacefully on his small farm in northern Argentina, having similarly exiled himself, but not before suffering much at the whim of a Paraguayan dictator. The author renders a faithful and poignant account of this, preceded by that of the Frenchman's rise to fame with the great Humboldt. She tells how the latter never abandoned his friend after Bonpland had retired to the forests of the southern hemisphere, even sending a doctor to inquire after his health in his final years.

One might supplement this introduction to French botanical exploration by consulting such time-proven works as Fournier's (1932) on the French naturalist-missionaries of the 15th to the 20th centuries, or the more recent and rather thorough account of horticultural explorers, not exclusively French, by Alice Coats (1969). Her bibliography alone makes one wonder what prompted Mr. Savage to claim — in the introduction to *The king's garden* — that botanical exploration is "a sadly neglected facet of history."

One of the greatest shortcomings of Duval's book is that it lacks a bibliography. Many older works on such notables as Joseph Dombey and Pierre Jacquemont, to name only two, would have been worth listing, because *The king's garden* prompts further inquiry but fails to provide leads for doing so. And while the "Index to plant names" gladdens, the absence of an index to people, places and things other than plants distresses. The illustrations enhance the text, but presenting them without primary documentation detracts from the author's credibility. For example, if J.-L. Charmet really photographed the event here titled "Bonaparte visits the French countryside," it would have been a miraculous occur-

rence. However, Charmet actually photographed an engraving whose designers and source receive no credit. Also, it would be interesting to know the sources, whether book or museum collection, and the artists and engravers of illustrations such as the 18th-century portrayals of the "Native village in Africa" and the "Death of Tournefort." But these matters aside, the price is right for a most readable book which is a credit to the publisher as well as the author.

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Michael T. Stieber
Hunt Institute

Walsh, Wendy, Ruth Isabel Ross and [E.] Charles Nelson. *An Irish florilegium: Wild and garden plants of Ireland*. London: Thames and Hudson Ltd., 1983. 224 pp., 48 color plates. \$125.00. ISBN 0-500-23363-2.

If you wonder why a South Vietnamese orchid or a California tree poppy is included in *An Irish florilegium*, yet the shamrock — a symbol of Ireland — is not, the authors anticipated your question in their preface: The subjects are strictly personal choices and include not only native plants, but also cultivars propagated in Ireland and plants found by Irish botanists. This first Irish florilegium or "gathering of flowers" is an ambitious, folio-size work, and its main appeal lies in the reproductions of 48 watercolors by Irish artist Wendy Walsh. The full-page tipped-in plates are in crisp register with delicate rendition on white stock (the text is in a rich brown ink on cream-colored stock).

Each plate is faced by a page of text on its subject by Nelson, who is taxonomist at the National Botanic Gardens, Glasnevin, Dublin. In his carefully written commentaries, with selected references, Nelson discusses taxonomy, morphology, geography, history and cultivation. Also noted are the grower, location and date of each specimen illustrated.

Ross, a horticultural journalist, has contributed a concise historical introduction that should prove a significant source for reference. It covers the discov-

ery of Irish plants, Irish garden plants, and Irish plant-hunters and their finds, and includes a bibliography. Those seriously interested in these subjects will also want to consult an earlier work edited by Nelson and A. Brady, *Irish gardening and horticulture* (Royal Horticultural Society of Ireland, 1979).

I cannot agree with the author of the fly-leaf text that "outstanding talent for botanical painting seems to be rarer in the present century than it was in the nineteenth . . .," but do agree that Walsh has assembled an interesting and attractive collection of paintings for this well produced book — good value for the price.

James J. White
Hunt Institute

West, Keith. *How to draw plants: The techniques of botanical illustration*. London: The Herbert Press Ltd. in association with The British Museum (Natural History), 1983. 152 pp., 93 figs. (10 in color). £9.95. ISBN 0-906969-28-X.

Formerly an art lecturer at the University of Canterbury, Christchurch, West also served for 20 years as botanical artist with the Botany Division of New Zealand's Department of Scientific and Industrial Research. Later, he illustrated species of *Epilobium* for the Missouri Botanical Garden and executed a series of ecological plant studies reproduced by that institution and the British Museum (Natural History). He is well-qualified to write and illustrate a book about drawing plants, and his is probably the most thorough one available.

West begins with a look at the past, including reproductions of works by notable botanical artists. Then he describes the basic equipment needed, with particular attention to work space and lighting. "Concepts" covers color mixing, tone values, botanical knowledge, self-criticism and accuracy. "Plant handling" discusses selecting the plant for illustration, dissecting, lighting, storage and herbarium specimens. "Plants in detail" is not only a botany lesson — amazing for the amount of information it contains — but an outline of the basic procedures for illustrating a variety of plant parts. Here are tips for rendering, among other things, roots, stem shading, seed details with respect to light, composite flower heads and bulb rotundity. Seven pages are devoted to leaves (including trichomes), a dozen to flowers and their parts. Chapters on media — pencil, ink, scraper board, watercolor and gouache (almost two dozen

pages) and acrylics — are all informative, with ample discussion of equipment and techniques. To this curator's joy, West emphasizes the use of good rag paper. The text concludes with brief chapters on photography and on preparing for the printer. In the latter I would have cited International Paper's long-valued *Pocket pal*, an excellent introduction to the graphic arts. A glossary of botanical terms and a selected bibliography are helpful additions.

At the recent opening of the Institute's Fifth International Exhibition, two visiting artists — one a relative beginner, the other an experienced illustrator — had their first chances to examine this book. They added their endorsements to that in Wilfrid Blunt's foreword, sustaining his opinion that the work should prove valuable to both amateur and professional. My concurring hunch is that *How to draw plants* will become a close companion to botanical artists and illustrators for years to come.

James J. White
Hunt Institute

