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Contributions to the Bibliography of John Lindley

Royal Horticultural Society

Cover illustration:

Studio portrait of John Lindley

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Occasional Papers

from the

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Volume Thirteen

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Lindley's contributions to the *Penny Cyclopaedia*

Brent Elliott
c/o The RHS Lindley Library, The Royal Horticultural Society, London

The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge was published in weekly parts between 1833 and 1844, by the Society for the Diffusion of Useful Knowledge.

It has long been known that John Lindley contributed heavily to the *Cyclopaedia*. Charles Knight, the founding editor, wrote that:

> In that of Botany, Dr. Lindley wrote all the articles up to the letter R. Dr. Edwin Lankester, who had studied under Dr. Lindley at University College, gave also his valuable assistance to the original work, and subsequently edited the Natural History Division of its successor [the *English Cyclopaedia*] (Knight, 1864: II, 230).

Allford, in his bibliography of Lindley, repeated this information in entry 98, and noted that two of Lindley's articles, on Endogens and Exogens, were reprinted separately as pamphlets (Allford, 99–100). Nobody hitherto, however, has enumerated Lindley's contributions, or noted the ambiguities of assigning particular articles to him, when there were other writers also handling certain botanical themes.

Background to the *Penny Cyclopaedia*

The Society for the Diffusion of Useful Knowledge was founded in 1826, the principal activist for its formation being Lord Brougham.

Henry Peter Brougham, barrister and journalist, one of the founders of the *Edinburgh Review*, defence attorney for Queen Caroline at her trial, anti-slavery campaigner and, in later years, Lord Chancellor and first Baron Brougham and Vaux, was, as this little list of basic categories indicates, an indefatigable politician and reformer. From 1824 he was involved with George Birkbeck in the creation of the Mechanics' Institute, and 1826 saw two major achievements: the foundation of University College, and the organisation of the Society as a means of publishing educational materials cheaply for mass consumption. Charles Knight, who had been pushing for such a publishing scheme since 1820, was chosen as the Society's editor and publisher.

The story of the SDUK's activities has been told more than once, including, in some detail, by Knight himself (Knight, 1864; Gray, 2006; Ashton, 2009). The first successful periodical issued under the Society's auspices was the *British Almanac*, which Knight claimed sold 10,000 copies a week. In 1832 Knight started the even more successful *Penny Magazine*, the first issue appearing on 31 March. Every Saturday thereafter until 1845, the working man's penny brought him a quarto instalment (eight pages), printed in double columns with a couple of wood-engravings in each issue, and covering a variety of topics in history and natural history. The success of the *Magazine* quickly got the directors of the Society thinking about a work in which knowledge could be organised more systematically, and in June 1832 an Address was issued about a new work that was being planned:

> The success of the 'Penny Magazine' has induced the Committee to undertake the publication of a 'Penny Cyclopædia,' in Numbers and Monthly Parts. A work of such magnitude and novelty requires all the assistance which can be afforded it by the Members of the Society [for the Diffusion of Useful Knowledge], both in London and in the Country, in order to give it publicity and circulation (Knight, 1864: II, 200).

The first issue appeared on 2 January 1833: again, a penny per weekly instalment.

"Every article was to be original", Knight had planned, "to be furnished by various men, each the best that could be found in special departments of knowledge" (Knight, 1864: II, 201). This ideal then abraded itself against the realities of the financial situation:

> It was impossible, moreover, to offer an adequate remuneration to a competent scholar or man of science, when it was said to him – You must give us the very cream of your knowledge; you must pour out the fullest information in the most condensed form of words; your articles must nevertheless be readable and perfectly intelligible to the popular mind; and yet, under these difficult conditions, you must be paid at a certain low rate per page. … The plan would never work. It would pay the gardener to grow dwarf pear trees and peach trees, but it would not pay the writer to produce dwarfed articles that, like

THE PENNY MAGAZINE

OF THE

Society for the Diffusion of Useful Knowledge.

123.] PUBLISHED EVERY SATURDAY. [MARCH 1, 1834.

THE MANGO TREE.

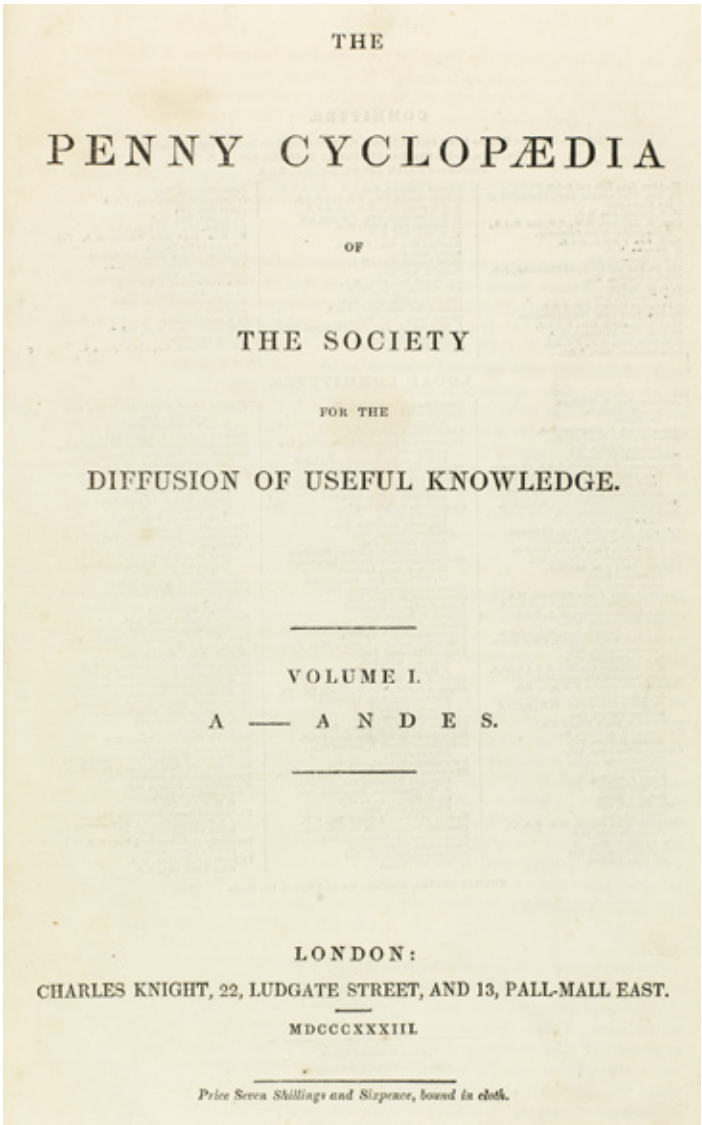
[Mango Tree.]

THE Mango-tree is a native of India and the south-western countries of Asia, and also grows abundantly in Brazil and the West Indies. It was introduced into Jamaica in the year 1782. It is a large tree, attaining the height of thirty or forty feet, with thick and wide-extended branches, and has been compared to the oak, in its manner of growth. The leaves are scattered, stalked, simple, about a span long and an inch or two wide, waxy, entire, tapering at each end, veiny, smooth, and shining.

"The flowers are small and whitish, formed into pyramidal branches; the fruit has some resemblance to a short thick cucumber, and, on the average of the varieties, of which there are many, about the size of a goose's egg. At first the fruit is of a fine green colour, and in some of the varieties it continues so, while others become partly or wholly orange. When ripe, the mango emits a smell which is very pleasant, and the flavour of it then is exceedingly gratifying. Externally there is a thin skin; and upon removing that, a pulp, which has some appearance of consistency, but which melts in the mouth with a cooling sweetness that can hardly be imagined by those who have not tasted that choicest of nature's delicacies. In the heart of the pulp there is a pretty large stone, resembling that of the peach, to which the pulp adheres firmly."—('Vegetable Substances,' p. 400.) In one variety of the mango, however, the stone does not exist.

The varieties of the mango are very numerous. Upwards of eighty are cultivated, and the size of the trees and the quality of the fruits vary according to the countries where they grow, and the circumstances of their situation. While the fruit, as a whole, is one of the most delicious of vegetable products, in some varieties it is so deteriorated as to have been, rather disparagingly perhaps, compared to a "mixture of tow and turpentine." The mangos of Asia are said to be much superior in size and flavour to those of America; and so

Fig. 1. **First page of a specimen issue of the *Penny Magazine*. This wood-engraving was not used in the *Penny Cyclopaedia*.**



THE

PENNY CYCLOPÆDIA

OF

THE SOCIETY

FOR THE

DIFFUSION OF USEFUL KNOWLEDGE.

VOLUME I.

A —— A N D E S.

LONDON:

CHARLES KNIGHT, 22, LUDGATE STREET, AND 13, PALL-MALL EAST.

MDCCCXXXIII.

Price Seven Shillings and Sixpence, bound in cloth.

Fig. 2. **Title page of the first volume of the *Penny Cyclopaedia*, 1833.**

> the rarities of the hot-house and conservatory, should be perfect in form, if not in size, bear good fruit, and not die very prematurely (Knight, 1864: II, 201–202).

The history of the *Penny Cyclopaedia* was more fraught with tension than that of the *Penny Magazine* (Knight, 1864: II, 200–240; Gray, 2006: 223–5).

> While it continued to be published upon its original plan of one number weekly, the sale was 75,000. The instant there was an issue of two numbers a week it fell to 55,000, and at the end of its second year it had fallen to 44,000. When the twopence a week became fourpence, the rate of diminution became still more rapid. The sale of the first year was double that of the fourth year. The sale of the fourth year doubled that of the eighth year. It then found its level, and became steady to the end – the 55,000 of the latter months of 1833 having been reduced to 20,000 at the close of 1843.

The *Cyclopaedia* was nearly bankrupted in 1841, and saved by the generosity of Messrs Clowes, its printers; Knight managed to get the work completed in 1844 by reducing the number of other publications the Society was issuing.

The Society for the Diffusion of Useful Knowledge was wound up in 1846. The project of educating the masses was of course controversial throughout the Society's career; Thomas Love Peacock, in his novel *Crotchet Castle* (1831), mocked it as the Steam Intellect Society, and similar condescension continued well into the twentieth century, as when Richard Hannay dismissed a character for "the smattering of cocksure knowledge which was common in his day – the 'culture of the Mechanics' Institute'" (Buchan, 1936: 132). But during its twenty years' existence, the Society had produced a massive body of literature, some of it at least of a very high order of expertise.

Lindley's involvement

John Lindley was a natural choice as the contributor of botanical articles for the *Cyclopaedia*. He was Professor of Botany at University College, an institution to some degree allied to the SDUK, and from his early writings

he had shown an ability to summarise complex subjects succinctly and sometimes with humour.

The preface to the *Cyclopaedia* explained the difference of this work from previous encyclopaedias: that whereas its predecessors "have generally given elaborate treatises on each branch of knowledge, often referring for the explanation of each term, as it occurs in the alphabetical order, to the general treatise", this work would "attempt to form systems of knowledge, but to give pretty fully, under each separate head, as much information as can be conveyed within reasonable limits". The entry for Aardvark, for example, begins by explaining the concept of Mammal before it concentrates on the individual animal.

As a example of Lindley's approach, let us take his article on *Quercus*, which must constitute his major treatment of the genus: it occupies nearly six pages of volume 19 (pp. 211–217). He begins: "QUERCUS, the Latin word for an 'oak-tree,' which is of frequent occurrence in the Roman writers. It is now, as then, applied to the oak and all the other species associated with it by botanists in one common genus." He then distinguishes it from *Castanea* and *Fagus*; describes its geographical distribution; calculates the approximate number of species; complains about the state of the existing literature; and then deals in sequence with the "Oaks of Europe, Northern Asia, and Barbary", "Oaks of the Levant", "Oaks of the Himalayas, China, &c.", "Oaks of the United States of North America", and "Oaks of Mexico". He concludes by referring the reader to Blume's *Flora Javae*, Webb's *Iter Hispanicum*, Humboldt and Bonpland, and Loudon's *Arboretum*. The compaint about existing literature is worth quoting at length:

> [Oaks have been] written upon by persons of little botanical knowledge, and the consequence has been such a confusion and entanglement of the history of even common and well known species, as can only be remedied by a long and patient examination of the genus by a botanist of great practical skill. On the present occasion we can pretend to nothing more than a brief account of those species which are best known, or to which it is most essential that attention should be directed. The reader will find a very elaborate account of the genus in Loudon's *Arboretum Britannicum*, vol. iv, where are wood-cuts of numerous species and an abundance of popular and amusing information.

Lindley's articles on *Erica* and *Orchidaceae* also form substantial treatments of the subjects, that on *Erica* giving a list of species and a great deal of horticultural advice extracted from James M'Nab and others. (Additional lists of cultivars are furnished in Lindley's articles on fruits – Apple, Cerasus, Citrus, Gooseberry, Peach, Plum, as well as the general article on Fruit, which supplies smaller lists for miscellaneous categories.) The article on *Rosa* is another substantial work, but from the fact that the article explicitly cites Lindley's *Rosarum Monographia*, I take it that it is probably Edwin Lankester's work; Lindley, if he needed to refer to his own publications, cited himself as, e.g., "the writer of this article" [in the article on *Orchidaceae*, in a reference to Bauer's *Illustrations of Orchidaceous Plants*].

Two of the most substantial articles that can be attributed to Lindley are Botany, which offers a history of the development of botany as well as a summary of the subject – a work quite distinct from his published book on *Botany* (1838) – and Garden, which is Lindley's only extended treatment of the history of gardening. Both articles are printed in the current volume: their first printing in 180 years. Lindley was to make further statements about his views on garden history and style in leaders in the *Gardeners' Chronicle* (Elliott, 1986a: 141–4; Elliott, 1986b: 99–101), in the *Journal of the Horticultural Society* (Lindley, 1848), and in an 1861 article in the *Athenaeum*, also printed in the current volume; both change and continuity in his views can be seen.

According to Knight, Lindley wrote all the articles on botany up to the letter R. The reason for his withdrawal from the *Cyclopaedia* then is simple: the volumes with R were published in 1841, the year that the *Gardeners' Chronicle* began to appear under Lindley's editorship.

In the years 1854–1856, Charles Knight published a spin-off from the *Penny Cyclopaedia*, under the title of *The English Cyclopaedia*. Four volumes of this work were devoted to *Natural History*, and many of Lindley's entries were reprinted in it, and the illustrations re-used; but many additional entries were included for plant genera to which Lindley had not give separate treatment – presumably by Lankester. As a further refinement, many family names which Lindley had left in Candollean format were brought into line with his own proposal to give plant families *–aceae* endings; so, for instance, *Berberideae* was upgraded into *Berberidaceae*.

Assignation of authorship

The final volume of the *Penny Cyclopaedia* contained an incomplete list of contributors. Those listed as writing articles relevant to botanical matters were:

E.W. Benson	Caoutchouc.
R. Dickson, MD	Materia Medica.
Rev. W. Hickey	Potato, Poultry.
Dr Lankester, FLS (Lecturer on Materia Medica at the St George's School of Medicine)	Botany and Vegetable Physiology.
Dr Lindley, FRS, FLS (Professor of Botany in University College, London)	Botany and Vegetable Physiology.
Rev. W.L. Rham (Vicar of Winkfield, Berkshire)	Agriculture.
J.F. Royle, MD, FRS (Professor of Materia Medica and Therapeutics, King's College, London)	East Indian Botany.

Lindley will not require identification; here are some notes on the identities of the others.

Edward White Benson (1800–1843), chemical engineer and manufacturer, and father of the future Archbishop of Canterbury bearing the same name.

Robert Dickson (1804–1875), Lecturer in Botany at St George's Hospital, London; provided plant descriptions for Maund's *Botanic Garden*.

William Hickey (1787–1875), Rector of Wexford in Ireland at the time the *Penny Cyclopaedia* was begun, and at Mulrankin by the time it finished; agricultural reformer and author, under the pseudonym of Martin Doyle, his works including *The Illustrated Book of Poultry* (1854).

Edwin Lankester (1814–1874), Coroner and first Medical Officer of Health for the City of Westminster; father of Ray Lankester, later Director of the Natural History Museum.

William Lewis Rham (1778–1843), Vicar of Winkfield and founder of the Winkfield School of Industry; his articles were later collected under the title *The Dictionary of the Farm*. (See Knight, 1864: II, 214–18 on Rham.)

John Forbes Royle (1798–1858), author of *Illustrations of the Botany of the Himalayan Mountains* and other works on Indian crops; Professor of Materia Medica at King's College; Secretary of the Horticultural Society, 1851–58.

Articles attributable to these authors are listed in this document whenever their work is plant-related and especially if it might be mistakenly attributed to Lindley. Rham's articles were later published in book form, under the title *The Dictionary of the Farm* (1845). So attributions to Rham in the following list are unambiguous and certain. For all other attributions there is a necessary element of uncertainty.

Lindley's articles on botany stopped with the letter R; Lankester presumably succeeded him as the botany writer. The changeover probably took place during the course of vol. XIX, most of the botanical entries in which appear to be by Lindley, but with Lankester responsible for the articles on *Rheum* and *Ribes* at least. The article on *Rosa* in vol. XX is based on Lindley's *Rosarum Monographia,* but as Lindley is cited in the text it may be Lankester's summary.

It is not stated who was responsible for biographical entries. Biographies of botanists are listed, and may in part be the work of Lindley or Lankester; those of Dioscorides and Theophrastus may be wholly or in part the work of Wilhelm Adolf Becker of Berlin, who handled ancient medical biography. Several articles were composite, employing different authors for different sections. Many articles on countries and geographical subjects include a paragraph on their vegetation; it is presumed that such paragraphs were the work of the general author of the article, but that separate articles on "[country], botany of" were Lindley's work. However, Rham contributed paragraphs on the agriculture of English counties to the entries on those counties, so it is quite possible that Lindley contributed sections on botany to various geographical entries.

This list does not include cross-references, e.g., on vol. I p. 21, "Abele tree, in Botany, the English name of the Populus alba. – (See POPULUS.)"

The Penny Cyclopaedia: Lindley's articles and related matters

Vol. I. A – Andes. 1833.

Articles by Lindley.

Abelmoschus (p. 21), Abies (pp. 29–34, illus., incl. reference to Abies in fossil botany), Acacia (pp. 59–61, illus.), Acanthaceae (p. 66, illus.), Acanthus (pp. 68–9, illus.), Acer (pp. 76–80, illus.), Achillea (p. 84), Achras (p. 85), Aconitum (p. 88, illus.), Acorus (p. 89, illus.), acotyledons (p. 89), Actaea (p. 102), aculeus or prickle (pp. 106–7), Adansonia (pp. 113–14, illus.), adhesions, theory of, in botany (pp. 119–20, illus.), Adiantum (p. 120), Adonis (p. 128), Adoxa (p. 130), Aecidium (pp. 138–9, illus.), Aesculus (p. 155, illus.), Aethusa (pp. 158–9, illus.), Africa part vii: plants of Africa (pp. 186–7), Agamae (p. 193), Agaricus (pp. 194–5, illus.), Agathis (p. 197), Agave (p. 198, illus.), age of trees (pp. 202–4, illus.), Agrimonia (p. 220, illus.), Agrostis (p. 222, illus.), air-plants (pp. 242–3), Alburnum (p. 273), Algae (pp. 322–4, illus.), Alismaceae (pp. 340–1, illus.), Allium (p. 354), Alnus (pp. 369–70, illus.), Aloe (pp. 370–1, illus.), Alopecurus (p. 376, illus.), Alps, vegetation of (p. 393), Althaea officinalis (p. 403, illus.), Amarantaceae (p. 413, illus.), Amaryllideae (pp. 413–4, illus.), Amentaceae (p. 428), America VI. Botany of America (pp. 445–7), Amomum (pp. 460–1, illus.), Amydgaleae (p. 478, illus.), Amygdalus (pp. 478–9), Amyrideae (p. 479), Anacardiaceae (p. 484, illus.), Anagallis (p. 485), Ananassa or the pine apple (pp. 489–90).

Articles by Rham.

After-math (p. 190).

Articles of uncertain authorship.

Amadou (p. 410 illus.), anbury and club-root (p. 504).

Biographical articles on botanists.

Adanson (pp. 112–3).

Vol. II. Andocides – Athanagilde. 1834.

Articles by Lindley.

Anemone (pp. 11–12), Angelica (p. 14, illus.), annuals (p. 47), Anonaceae (pp. 53–4, illus.), Anthemis (p. 94), Anthoxanthum (p. 96, illus.), Antiaris (pp. 98–9, illus.), Apium (p. 160), Apocyneae (pp. 163–4), apple (pp. 189–91), apricot (pp. 197–8), aquatic plants (pp. 202–3), Araliaceae (p. 238, illus.), Araucaria (p. 249, illus.), Arbutus (pp. 255–6), Arctostaphylos (p. 290), Areca (pp. 297–8, illus.), Areng (p. 299, illus.), Argemone (p. 306), Arillus (p. 318), Aristolochiae (p. 328, illus.), Aroideae (pp. 385–6, illus.), aroma (p. 386), aromatics (pp. 386–7), Arracacia (p. 389, illus.), Arrow-root (pp. 399–400), Artemisia (p. 411), Artocarpeae (p. 420), Artocarpus (pp. 420–1, illus.), Arundo (p. 427), Asarium (p. 435), Asclepiadeae (pp. 439–40, illus.), Asia,

botany of (pp. 477–80)?, Asparagus (p. 488), Asphodeleae (pp. 489–90, illus.), Asphodelus (p. 490), Astrocaryum (p. 524, illus.).

Articles by Dickson.
Aristolochia, medical uses of (pp. 328–9), Assafoetida (p. 493).

Articles by Rham.
Arable land (pp. 220–9, illus.).

Articles by Royle.
Asia, botany of (pp. 477–80, citing Royle). How much of this article was Royle, and how much Lindley?

Articles of uncertain authorship.
Ashes (pp. 450–1).

Vol. III. Athanaric – Bassano. 1834.

Articles by Lindley.
Atropa (pp. 47–8, illus., one copied from Sibthorp), Attalea (p. 54, illus.), Aucuba (p. 79), Aurantiaceae (pp. 101–2, illus.), Auricula (pp. 107–9), Australia, botany of (pp. 123–5, illus.), Avena (p. 166), Averrhoa (p. 168), Axilla (pp. 183–4), Azalea (pp. 199–201), Babiana (p. 226, illus.), Bactris (p. 254, illus.), Balanophoreae (pp. 309–10, illus.), Balsamiflurae (p. 344), Balsamina (p. 344), Balsamineae (p. 344, illus.), Balsamodendron (pp. 344–6, illus.), Bambusa (pp. 355–7), Banksia (pp. 405–6, illus.), bark (pp. 454–6, illus.), bark-bed (p. 456).

Articles by Dickson.
Atropa belladonna, medical uses of (pp. 48–9), balsams (p. 346), bark (pp. 456–8).

Articles by Rham.
Barley (pp. 461–6, illus.), barley, pearl (pp. 466–8, illus.), barn (pp. 470–2), barren land (pp. 497–501, illus.).

Articles of uncertain authorship.
Attar, or otto of roses (p. 56); Austria: cultivation of the soil and its products (pp. 139–41).

Biographical articles on botanists.
Banks, Sir Joseph (pp. 401–4). Barometz (p. 485). Barrelier (p. 497). Barton, Benjamin Smith (pp. 521–2).

Vol. IV. Bassantin – Bloemaart. 1835.

Articles by Lindley.

Bassia (pp. 2–3, illus.), Bauhinia (pp. 47–8, illus.), Begoniaceae (pp. 163–4, illus.), belladonna (p. 191), Belvisiaceae (p. 206, illus.), Berberideae (pp. 259–62, illus.), Bertholletia (pp. 322–3, illus.), Betula (pp. 348–50, illus.), Betulaceae (p. 350), biennials (p. 390), Bignoniaceae (p. 391, illus.), Bixa (pp. 474–5, illus.), blight (p. 515).

Articles by Dickson.

Bdellium (p. 77), Bergamot, essence of (pp. 271–2)?, Bitters (pp. 472–3).

Articles by Rham.

Bean (pp. 79–83, illus. with agricultural equipment), Bedfordshire: section on climate and agriculture (pp. 141–3), beet (pp. 158–61), Berkshire: sections on climate, soil, agriculture, gardens, woods and coppices, &c (pp. 284–7), Berwickshire: section on agriculture (pp. 330–4).

Article by Royle.

Batatas (p. 19, illus.)?.

Biographical articles on botanists.

Bauhin, John (p. 47), Bauhin, Gaspard (p. 47), Beauvois, Ambrose Maria Francis Joseph Palisot de (p. 120).

Vol. V. Blois – Buffalo. 1836.

Articles by Lindley.

Boletus (p. 75, illus.), Bombaceae (p. 101), Boragineae (p. 173, illus.), Borassus (pp. 173–4, illus.), borecole (pp. 181–2), Boswellia (pp. 241–2), botany (pp. 243–54, including, pp. 251–4, a glossary of technical terms), Botrytis (p. 260), bottom heat (pp. 262–3), bract (p. 315), Brassica (pp. 353–4), Brocoli (p. 458), Brome-grass (p. 460), Bromeliaceae (p. 460), Brugmansia (p. 487), Bryonia (p. 502), Bryophyllum (p. 502), bud (pp. 524–5), budding (pp. 532–3).

Articles by Dickson.

Boletus, medical uses of (p. 75).

Articles by Rham.

Bog (pp. 48–51), bog-earth (p. 51), bones (pp. 150–2, illus.), Brabant, agriculture of (pp. 305–7), brand or burn (p. 344), Buckinghamshire: section on agriculture (pp. 515–7), buck-wheat (pp. 523–4).

Vol. VI. Buffon – Charles's wain. 1836.

Articles by Lindley.

Bulb (p. 5), bulbous plants (pp. 5–6), bullace (p. 11), Burmanniaceae (p. 37), Burseraceae (p. 47, illus.), Butomaceae (pp. 64–5, illus.), Buttneriaceae (p. 69, illus.), Buxus (p. 75), Cactus (pp. 97–8, illus.), Caesalpinia (p. 118), Calamus (p. 135), Calathidium (pp. 137–8), Calceolaria (p. 140), Calla (p. 162), Callitrichaceae (p. 166), Calochortus (p. 168), caltha (p. 170), Calycanthaceae (p. 173), Calyceraceae (p. 173, citing Lindley), Calyciflorae (p. 173), Calyptra (p. 173), calyx (p. 174), cambium (p. 175), Camellia (p. 191), Campanulaceae (p. 201, illus.), Camptodontus (p. 207), Canella alba (pp. 237–8, in part), Cannabis (p. 239), Capparidaceae (p. 272, illus.), caprification (pp. 273–4)?, Caprifoliaceae (p. 274, illus.), Capsicum (pp. 274–5), Cardoon (p. 291), Carica (pp. 293–4), Carina (p. 294), Carnation (p. 305), Carpinus (pp. 315–16), Carpobalsamum (p. 316), Carrot (p. 319–20), Carya (pp. 331–2), caryocar (p. 333), Caryophylleae (p. 333, illus.), Caryophyllus aromaticus (pp. 333–4, illus.), Cassava (pp. 344–5), Cassia (pp. 345–6), Cassia buds (p. 346), Castanea (p. 350), Castanospermum (p. 350), Casuaraceae (pp. 358–9, illus.), Catalpa (p. 363), catchfly (p. 366), catkin (p. 376), cauliflower (p. 383), Celastraceae (pp. 398–9, illus.), celery (p. 400), Celosia (p. 408), Centaurea (p. 414), Cephaelis (p. 423), Cephalanthus occidentalis (p. 423), Cerasus (pp. 431–3), Ceratonia siliqua (p. 433, illus.), Ceratophylleae (p. 433), Cerbera (pp. 433–4), Cercis siliquastrum (p. 435), Ceria (p. 437), Ceroxylon andicola (p. 439, illus.), Ceutorhynchus (p. 447), Chailletiaceae (p. 462, illus.), Characeae (p. 488, illus.), chard beet (p. 490).

Article by Benson.

Caoutchouc (pp. 254–5).

Articles by Dickson.

Calamus (pp. 135–6), Calotropis gigantea (pp. 168–9), Canella alba (pp. 237–8, in part), cascarilla (p. 338)

Articles by Rham.

Burnt-ear (pp. 45–6), cabbage (pp. 92–3), Cambridgeshire: section on agriculture (p. 181), Canary grasss (p. 230), caraways (p. 280), carrot (in agriculture) pp. 320), cart (pp. 322–3), chalk (pp. 465–6).

Articles of uncertain authorship.

Catechu (p. 367), either Royle or Dickson. Ceylon: vegetable productions (p. 453), either Lindley or Royle.

Biographical articles on botanists.

Bulliard, Pierre (pp. 16–17).

Vol. VII. Charleston – Copyhold. 1837.

Articles by Lindley.

Charlock (p. 2), cheese-rennet (p. 16), Cheirostemon platanoides (p. 28, illus.), Chelidonium (p. 29), Chenopodiaceae (pp. 38–9, illus.), cherimoyer (p. 40), cherry (p. 41), chervil (p. 41), chickweed (p. 60), Chimonanthus (p. 68), chives (p. 100), Chlenaceae (pp. 104–5, illus.), Chloranthaceae (p. 105, illus.), Chlorophyle (p. 109), Chrysanthemum (p. 136), Chrysobalanaceae (p. 137, illus.), Chrysophyllum cainito (p. 139), Cicuta virosa (p. 160, illus.), Cinchona (pp. 168–74, illus., but with long section on cinchona bark probably by Dickson), Cinchonaceae (p. 174), Cinnamomum (pp. 176–8, illus.), Circaea (pp. 182–3), Cistaceae (p. 212, illus.), Citrus (pp. 214–6), Clematis (p. 248), cloudberry (p. 272), clove pink (p. 272), club-moss (p. 275), coal plants (pp. 290–96, illus.), Cocculus (pp. 305–7, illus.), Cocos (pp. 313–4, illus.), Coffea (pp. 321–3, illus.), Colchicum autumnale (pp. 338–9, in part), Colocasia (p. 355), Columelliaceae (p. 381, illus.), Colutea (p. 388), Combretaceae (p. 392, illus.), Commelinaceae (p. 398, illus.), Compositae (pp. 421–3, illus.), compound flowers (p. 424), Confervae (p. 444), Coniferae (pp. 453–4, illus.), Conium maculatum (pp. 454–5, in part), Connaraceae (p. 458, illus.), conservatory (pp. 465–6)?, Convolvulaceae (p. 489, illus.), Copaifera officinalis (p. 497, illus.).

Articles by Dickson.

Cinchona: portion dealing with cinchona bark (pp. 171–4), cinchonia (pp. 174–5), Citrus aurantium (p. 216), coca (pp. 304–5, illus.), cocumiglia (p. 314), Colchicum autumnale (pp. 338–9, in part), Conium maculatum (pp. 454–5, in part), Convolvulus jalappa (p. 489), copaiba (pp. 496–7).

Articles by Rham.

Cheshire: section on agriculture (pp. 44–5), chicory (pp. 60–1), clay (pp. 245–7), clover (pp. 272–4), cock's-foot grass (p. 310), cole (p. 339), commons (p. 405), coppice (pp. 506–7).

Articles of uncertain authorship.

China: section on botany of China (p. 76), cider (pp. 161–2 cites Marshall).

Vol. VIII. Copyright – Dionysius. 1837.

Articles by Lindley.

Cordiaceae (pp. 7–8), Coriandrum sativum (p. 11, illus.), Coriariaceae (pp. 11–12, illus.), cork (p. 14), Cornaceae (pp. 22–23, illus.), Corylaceae (p. 73, illus.), Corylus (pp. 73–4), corymb (p. 74), Corypha (p. 74), cotyledon (p. 103, illus.), Coumarouna odorata (p. 106, illus.), cow-tree (pp. 120–1), cowparsley / cowparsnep (p. 122), Crambe maritima (p. 136), cranberry (p. 136), Crassulaceae (p. 141, illus.), cream fruit (p. 141)?, cress (p. 151), Crocus (pp. 169–70),

Croton (pp. 178–9, illus.), Crozophora tinctoria (p. 183, illus.), Cruciferae (pp. 183–4, illus.), Cryptogamia (p. 198), cucumber (p. 211)?, Cucumis (pp. 211–12), Cucumis colocynthis (p. 212), Cucurbita (p. 212), Cucurbitaceae (pp. 212–14, illus.), Cuminum cyminum (p. 231, illus.), Cunninghamia sinensis (p. 231), Cunoniaceae (p. 231, illus.), Cupressus (p. 233), Curcuma longa (pp. 233–4), currant (p. 234), Cuscutaceae (pp. 238–9, illus.), cuticle (p. 243), cutting (pp. 244–5), Cycadaceae (pp. 247–8, illus.), Cyclanthaceae (p. 248, illus.), Cydonia vulgaris (p. 250), cyme (p. 251), Cynara (p. 251), Cynomoriaceae (p. 253), Cynosurus cristatus (p. 253, illus.), Cyperaceae (pp. 253–4, illus.), Cyrtandraceae (p. 267, illus.), Cytinaceae (pp. 269–70, illus.), Cytisus (p. 270), Dactylis glomerata (p. 282, illus.), daffodil (p. 284), Dahlia (p. 285), daisy (p. 289), damson (p. 298), dandelion (p. 299), Daphne (pp. 307–8), Daphne mezereum (p. 308), Datiscaceae (p. 313, illus.), Datura (pp. 313–14), Datura stramonium (p. 314, in part), Daucus (p. 315), Delphinium (pp. 374–5), Delphinium staphisagria (p. 375), Dendrobium (p. 394), Desvauxiaceae (p. 442), Deutzia (p. 444), Diandria (p. 475), Dianthus (pp. 475–6), Diapensiaceae (p. 476), dichotomy (p. 480), diclinous (p. 480), dicotyledons (p. 480), Dictamnus (p. 480)?, Didynamia (p. 486), Diervilla (p. 487), Digitalis (pp. 495–6), Dilleniaceae (p. 497, illus.), Dioecia (p. 506).

Articles by Dickson.

Croton oil (p. 179), Cytisus scoparius (p. 270), Datura stramonium (p. 314, in part), daturia (p. 314), decoctions (p. 345), delphia (p. 374), digitalia (p. 495), Digitalis purpurea (p. 496).

Articles by Rham.

Cornwall: section on agriculture (p. 31), couch grass (pp. 103–4), Derbyshire: section on agriculture (pp. 420–1), Devonshire: section on agriculture (pp. 453–5).

Article by Royle.

Cowitch (p. 121, illus.).

Articles of uncertain authorship.

Cottage allotments (pp. 88–9), cotton cultivation and trade (pp. 91–4).

Vol. IX.Dionysius – Erne. 1837.

Articles by Lindley.

Dioscorea (pp. 3–4), Dioscoreaceae (p. 4, illus.), Diosma (p. 5), Dipsaceae (p. 12, illus.), Dipteraceae (p. 14, illus.), Dipterocarpus (p. 14), disbudding (pp. 16–17), distichous (p. 22), Dodecagynia (p. 47), Dodecandria (p. 47), dogwood (p. 63), dolabriform (p. 63), Dolichos (p. 64), Dombeya (p. 66), down (p. 110), Dracaena (pp. 117–8), dropwort (p. 157), Droseraceae (p. 157, illus.), Drupaceae (p. 160), drupe (p. 160), Dryandra (p. 161), Dryobalanops (pp. 161–2),

duramen (p. 205), Durio (p. 222), dwarfing trees (p. 224), earth-nuts (p. 242), Ebenaceae (p. 254, illus.), Eccremocarpus scaber (p. 257), Echinocactus (p. 262, illus.), Echites (p. 263), Echium (p. 263), eddoes (p. 268), egg plant (pp. 304–5), eglantine (p. 305: Milton), Egyptian bean (p. 318), Ehretiaceae (p. 318, illus.), Elaeagnaceae (pp. 323–4, illus.), Elaeis (pp. 324–5, illus.), Elaeocarpaceae (p. 325, illus.), elcaja (p. 331), elecampane (p. 332), Elettaria (p. 355), Empetraceae (p. 383, illus.), endive (p. 395), endogens (pp. 395–9, illus.), Epacridaceae (pp. 465–6, illus.), Epidendrum (p. 473), epiphyllospermous plants (p. 477), epiphytes (pp. 477–81), Equisetaceae (p. 492, illus.), Eranthemum (p. 496), Eranthis (p. 496), ergot (p. 501), Erica (pp. 501–4, with species list and flowering times), Ericaceae (p. 504, illus.), Eriocauloneae (pp. 508–9, illus.).

Articles by Dickson.
Dorstenia (pp. 102–3), emeta (p. 377).

Articles by Rham.
Dorsetshire: section on agriculture (pp. 95–7), draining (pp. 119–22), drilling (pp. 148–50, illus.), Durham: section on agriculture (pp. 210–2).

Articles by Royle.
Eagle-wood (pp. 235–6).

Articles of uncertain authorship.
Dock (p. 44), dry-rot (pp. 163–4), ebony (pp. 254–5), elemi (p. 344).

Biographical articles on botanists.
Dioscorides (pp. 4–5), possibly by Wilhelm Adolf Becker.

Vol. X. Ernesti – Frustum. 1838.

Articles by Lindley.
Erythraea (p. 7), Erythrina (p. 7), Erythronium (p. 7), Erythroxyleae (pp. 7–8, illus.), Escalloniaceae (pp. 9–10, illus.), Eschscholtzia (p. 11), Espalier (pp. 11–12), etaerio (p. 45), Eucalyptus (pp. 60–1), Eugenia (p. 65), Eupatoriaceae (p. 70), Euphorbia (p. 70, illus.), Euphorbiaceae (p. 70, illus.), Europe, botany of (p. 94), evergreens (pp. 98–100), everlasting flowers (p. 100), exogens (pp. 120–31, illus.), ferns (p. 239), Ferula (pp. 211–2), Festuca (p. 212)?, Ficus (pp. 258–9), filbert (pp. 268–9), flower (p. 326), flowers (pp. 326–7), Foeniculum (p. 333), foetus (pp. 335–6), forcing (pp. 351–2), Francoaceae (pp. 337–8, illus.), Frankeniaceae (p. 338, illus.), Fraxinus (pp. 454–5), French berries (p. 470), frond (p. 497), fruit (pp. 499–501), fruits, preservation of (pp. 501–2).

Articles by Dickson.
Erythraea centaurium (p. 7), Euphorbium (pp. 70–1), extracts (pp. 132–3).

Articles by Rham.
Essex: section on agriculture (pp. 18–9), fallow (pp. 191–2), farm (pp. 196–200, illus.), fences (pp. 225–6), Flanders: section on agriculture (pp. 299–302), flax (pp. 302–5, illus.), forest science (pp. 359–61), France, agriculture of (pp. 410–1).

Articles of uncertain authorship.
Forest (pp. 354–9), fountain (pp. 387–8, illus.), food of labourers (pp. 345–6).

Vol. XI. Fuego, Tierra del – Haddingtonshire. 1838.

Articles by Lindley.
Fumariaceae (p.14, illus.), Fungi (pp. 18–21, illus.), galanga (p. 34), Galanthus (p. 34), Galiaceae (p. 40, illus.), Galipea (p. 47), Garden (pp. 70–4), garlic (p. 78), Garryaceae (p. 82), gelder rose (p. 108), Gentiana lutea (pp. 120–1), Gentianaceae (p. 121, illus.), Geoffraea inermis (p. 124), Geraniaceae (p. 181, illus.), germen (p. 199), germination (p. 199, illus.), Gesneraceae (p. 204, illus.), Gilliesiaceae (p. 221), ginseng (p. 223), gland (p. 250, illus.), Gleicheniaceae (p. 260), Globba (p. 263), Globulariaceae (p. 263, illus.), Gloriosa (p. 264), Glossopteris (p. 264), glumaceous plants (p. 278), Glycyrhiza (p. 278, illus.), Gmelina (p. 279), Goodeniaceae (p. 304, illus.), gooseberry (pp. 309–10 with list of cultivars), Gossypium (pp. 313–5, illus.), grafting (pp. 341–2), grains of paradise (p. 343),Graminaceae (p. 345–8, illus.), grape-vine (pp. 356–9), greenhouse (pp. 437–8, illus.), Grewia (p. 451), Grislea (p. 454), Grossulaceae (p. 457, illus.), groundsel (p. 459), Gruinales (p. 460), Guaiacum (p. 463, illus.), gum-resins (p. 486), Guttiferae (pp. 501–2, illus.), gymnosperms (p. 510, illus.), Gynandria (p. 511), Gyrocarpus (p. 516).

Articles by Dickson.
Galbanum (p. 38), Galipea (pp. 47–8), Galls (p. 53), Glycyrhiza glabra (pp. 278–9), Guaiacum officinale (pp. 463–4).

Articles by Rham.
Garden husbandry (pp. 74–7), Gloucestershire: section on agriculture (pp. 268–70), grass land (pp. 363–4), gypsum (pp. 515–6).

Biographical articles on botanists.
Gerarde (pp. 181–2).

Vol. XII. Hadley, John – Intestina. 1838.

Articles by Lindley.

Haemodoraceae (p. 3, illus.), hairs (p. 10, illus.), Halorageae (p. 23, illus.), Hamamelaceae (p. 23), heartsease (pp. 86–7), heat of vegetables (pp. 89–90), Hebradendron (pp. 90–91, illus.), Hedera (p. 96), Helleborus (p. 112), Hensloviaceae (p. 136, illus.), hesperidium (p. 187), Hibiscus (p. 193), Hippocrateaceae (p. 241, illus.), Hippocratea (p. 242), Hippomane mançanilla (pp. 243–4, illus.), Hiptage (p. 250), Homaliaceae (p. 273, illus.), Hordeum (pp. 290–1), hotbed (p. 317), hothouse (pp. 317–21), hot-wall (pp. 321–2), Humulus lupulus (p. 341), hyacinth (pp. 365–6), Hydrangea (p. 380), Hydrocharaceae (p. 386, illus.), Hydroleaceae (pp. 397–8, illus.), Hydrophyllaceae (pp. 400–1, illus.), Hyoscyamus (p. 409), Hypericaeae (p. 411, illus.), Iberis (p. 425), Icosandria (p. 433), Ilex (pp. 442–3), Illecebraceae (p. 444, illus.), Illicium (pp. 444–5), Impatiens (pp. 449–50), impregnation (p. 452), Indigofera (p. 462), inflorescence (pp. 473–4, illus.), Inga (pp. 476–7), inoculation (pp. 483–4).

Articles by Dickson.

Haematoxylon campechianum (p. 3), Helleborus officinalis (p. 112), Hyoscyamus niger (pp. 409–10), Iceland moss (p. 427).

Articles by Rham.

Hampshire: section on agriculture (pp. 29–31), harvest (pp. 58–9), hedge (pp. 96–7), Herefordshire: section on agriculture (pp. 151–2), Hertfordshire: section on agriculture (pp. 179–80), hoe, horse-hoeing (pp. 257–8, illus.), hops (pp. 288–9), Humulus lupulus (pp. 341–2, illus.), Huntingdonshire: section on agriculture (pp. 350–1), husbandry (pp. 356–60).

Articles by Royle.

Himalaya: paragraph on vegetation (p. 201).

Articles of uncertain authorship.

Hemp (pp. 115–6).

Vol. XIII. Intestines – Limoges. 1839.

Articles by Lindley.

Inula helenium (p. 2), involucrum (p. 6), Ionidium (p. 16), Ipomoea (pp. 17–18, illus.), Iridaceae (p. 26, illus.), Ixora (p. 66), Jasminaceae (p. 95, illus.), Jatropha (p. 95), Jericho, rose of (p. 105), Jonesia (p. 137), Juglandaceae (pp. 143–4, illus.), Juncaceae (p. 146, illus.), Juncaginaceae (pp. 146–7, illus.), Jungermanniaceae (p. 147, illus.), Juniperus (pp. 147–8), Justicia (pp. 160–1), Kaempferia (p. 170), Khaya (p. 207), kitchen-garden (pp. 242–4), Krameriaceae (pp. 254–5,

illus.), lablab (p. 259), laburnum (p. 262), Lacistemaceae (p. 266, illus.), Lagerstroemia (p. 271), Lamiaceae (p. 283, illus.), Lantana (p. 322), Latania (p. 343), Lauraceae (p. 354, illus.), Laurus (pp. 354–5), lavender (p. 358), lawn (p. 366), Lawsonia (p. 367), layering (pp. 367–8), leaf (pp. 374–5), leaf-bud (p. 375, illus.), Lecythidaceae (pp. 380–1, illus.), Leguminosae (pp. 396–7, illus.), Lentibulaceae (p. 423, illus.), Lepidodendron (pp. 438–9), Lepidophyllum (p. 439), Lepidostrobus (p. 440), Leycesteria (p. 456), liber (pp. 458–9), lichens (pp. 462–3, illus.), lignin (p. 480), ligulate flowers (p. 480), Liliaceae (p. 481, illus.).

Articles by Dickson.
Ipecacuanha (pp. 16–17), Krameria triandra (p. 254), ladanum (p. 269), Lavandula spica (p. 357), legumin (p. 396), Leontodon taraxacum (p. 430), lime, medical properties of (pp. 488–9).

Articles by Rham.
Irrigation (pp. 39–42, illus.), kelp (p. 179), Kent: section on agriculture (pp. 183–5, illus.), Lancashire agriculture (pp. 291–2), Leicestershire agriculture (pp. 402–3).

Articles by Royle.
Java (section on botany, p. 97), lac (pp. 263–4), Lansium (p. 322).

Biographical articles on botanists.
Jussieu (pp. 156–8), Kent (portion on horticulture, p. 185), Knight, Thomas Andrew (pp. 248–9 – probably by Lindley).

Vol. XIV. Limonia – Massachusetts. 1839

Articles by Lindley.
Limonia (p. 1), Linaceae (p. 1), Linum (p. 27, illus.), Loasaceae (p.76, illus.), Lobeliaceae (p. 77), locust tree (p. 83), Lolium (pp. 98–9), Loranthaceae (p. 149), love-apple (p. 179), Luculia (p. 192), Lycopus europaeus (p. 211), Lycoperdon (p. 211), Lycopodiaceae (p. 212), Lycopodites (p. 212, illus.), Lythraceae (p. 229, illus.), Madia (p. 262), Magnoliaceae (pp. 290–1, illus.), maiden hair (p. 295), Malesherbiaceae (p. 332), Malope (p. 340), Malpighiaceae (p. 341, illus.), Malvaceae (pp. 351–2, illus.), Mangifera (pp. 383–4), Mantellia (p. 393), Marantaceae (pp. 497–8, illus.), Marcgraaviaceae (pp. 410–1, illus.), Marchantiaceae (pp. 411–2, illus.).

Articles by Dickson.
Linum usitatissimum, medical properties of (pp. 27–8), Lobelia inflata (p. 77), lupulin (p. 202), macer (p. 241 citing Royle), male fern (p. 330), Malva sylvestris (p. 351), Manettia cordifolia (p. 379), manna (p. 386), Maranta arundinacea (p. 407), Marrubium vulgare (p. 444).

Articles by Rham.
Lincolnshire: section on agriculture (pp. 5–7), loam (pp. 75–6), lucern (pp. 188–9), madder (pp. 260–1), maize (pp. 310–1), manure (pp. 397–402), manuring (pp. 402–3), markets, agricultural (pp. 423–4).

Articles of uncertain authorship.
Lotus of the ancients (pp. 161–2), malabathrum (p. 313), manna, kinds of (p. 386 – Lindley or Royle?).

Biographical articles on botanists.
Linnaeus: section on botany (pp. 24–5 – probably by Lindley), Lobel (p. 77).

Vol. XV. Massagetae – Muridae. 1839.

Articles by Lindley.
Masterwort (p. 3), Mathiola (pp. 14–5), medick (pp. 58–9), Melanorrhoea (pp. 77–8, illus.), Melanthaceae (pp. 78–9, illus.), Melastomaceae (p. 79, illus.), Melia (p. 80), Meliaceae (p. 80, illus.), melon (pp. 85–6), Memecyclaceae (p. 88, illus.), Menispermaceae (pp. 95–6, illus.), Menispermum (p. 96), Mesembryaceae (p. 124, illus.), Mespilus (pp. 125–6), metamorphosis of organs (pp. 131–5), mildew (pp. 209–10), millet (p. 225), Mimoseae (p. 230), misseltoe (pp. 265–6), Monimiaceae (p. 331, illus.), Monocotyledons (p. 340), Monotrapaceae (p. 342), morel (p. 405), motions of plants (pp. 458–9), mouldiness (pp. 461).

Articles by Dickson.
Mastich (p. 3), materia medica (pp. 6–7), Mentha piperita (p. 99), Mentha pulegium (p. 99), Mentha viridis (p. 99)?, Menyanthes trifoliata (p. 99), morphia (pp. 410–1).

Articles by Rham.
May-weed (p. 25), meadows (p. 34), melilot (p. 80), Middlesex: section on agriculture (pp. 192–3), moor (pp. 373–4).

Vol. XVI. Murillo – Organ. 1840.

Articles by Lindley.
Musa (pp. 7–8, illus.), Musaceae (p. 8, illus.), Musci (pp. 9–10, illus.), mushroom (pp. 18–19), Myoporaceae (p. 38), Myricaceae (p. 38, illus.), Myristicaceae (p. 39, illus.), Myrsinaceae (p. 40), Myrtaceae (pp. 40–1, illus.), myrtle (p. 41), Naiades (p. 68, illus)., naked seeds (p. 70), Narcissus (p. 88), nasturtium (p. 98), natural orders of plants (pp. 106–7), Nelumbiaceae (pp. 140–1, illus.), Neottia (p. 142), Nepenthaceae (pp. 144–5, illus.), nucleus (p. 360), Nymphaeaceae (pp. 376–7, illus.), Ochnaceae (p. 395), ochra (p. 395), ocrea (p. 396), Oenanthe (p. 403, illus.),

Olacaceae (p. 420), Oleaceae (p. 424, illus.), Onagraceae (p. 437, illus.), Oncidium (p. 437, illus.), onion (p. 438), Opuntia (p. 463), orange (pp. 465–6), orchard (pp. 475–6), Orchidaceae (pp. 476–9, illus.).

Articles by Dickson.
Musk (pp. 27–8, illus.), Myristica moschata (pp. 38–9), Myrospermum (p. 40), narcotics (p. 88), narcotina (pp. 88–9), Nicotiana tabacum (pp. 213–4), nicotianin (p. 214), oils, vegetable (pp. 417), Opoponax chironium (p. 457), orcin (p. 480).

Articles by Rham.
Norfolk: section on agriculture (pp. 260–2), Northamptonshire: section on agriculture (pp. 298–9), Northumberland: section on agriculture (pp. 310–2), Nottinghamshire: section on agriculture (pp. 338–9), oats (pp. 383–4).

Articles by Royle.
Olbanum (pp. 426–7)?.

Articles of uncertain authorship.
Olive oil (pp. 427–8), Orchil (p. 479, illus.).

Vol. XVII. Organ – Pertinax. 1840.

Articles by Lindley.
Ornithopus (p. 28), Orobanchaceae (p. 36, illus.), orpine (p. 38), Oryza: part at least (pp. 45–6, illus.), osier (p. 49), Ostrya (p. 56), Otopteris (pp. 62–3, illus.), ovule (p. 74), Oxalidaceae (p. 91, illus.), Paeonia (p. 126), Paliurus aculeatus (p. 168, illus.), palms (pp. 174–5, illus.), palmyra (p. 176), Pandanaceae (p. 185, illus.), Pandanus (p. 185), panicle (p. 189), Panicum (pp. 189–90), pansy (p. 191), Papaver (p. 202), Papaveraceae (p. 207, illus.), Papayaceae (p. 207, illus.), Papilionaceae (p. 217), pappus (p. 218), Papyrus (p. 220), parasitical plants (pp. 241–2), Parella (p. 245), Parkia (p. 269), Parkinsonia aculeata (p. 269), parsley (p. 287), parsnip (pp. 287–8), Paspalum (p. 302), pasque flower (p. 302), Passiflora (pp. 303–4, illus.), peach (pp. 345–7, with cultivar list), pear (pp. 247–8), Pedaliaceae (p. 365, illus.), peduncle (p. 368), Peganum (p. 371), Pekea (pp. 373–4, illus.), Pelargonium (p. 377), Pentadesmis butyracea (p. 426), pepo (p. 428), pericarp (p. 445), perichaetium (p. 445), peristomium (p. 458), periwinkle (p. 459), Persea gratissima (pp. 463–4, illus.), Persicaria (p. 487), persimon (p. 487).

Articles by Dickson.
Papaver. opium (pp. 202–7).

Articles by Rham.
Oxfordshire: section on agriculture (pp. 96–8), paring and burning (pp. 250–2, illus.), pasture land (pp. 305–6), pea (pp. 343–5), peat (pp. 352–3).

Articles of uncertain authorship.
Park (p. 265).

Vol. XVIII. Peru – Primates. 1840.

Articles by Lindley.
Phalaris (p. 56), Phaseolus (pp. 57–8), Philadelphaceae (p. 70, illus.), Philadelphus (p. 72), Phillyrea (p. 93), Phoenix (pp. 103–4), Phormium (p. 109), Phragmites (p. 115), phyllodium (p. 127), Phytolacca (p. 138, illus.), Phytolaccaceae (pp. 139–40), pimpernel (p. 160), Pimpinella (p. 160), pine-apple (pp. 164–5), Pinus (pp. 170–3), Piperaceae (p. 177, illus.), pistacia nut (p. 187, illus.), pith (p. 189), Pittosporaceae (p. 196, illus.), placenta (p. 206), plane (p. 211), Plantaginaceae (p. 213, illus.), planting and plantations (pp. 213–7), Platanthera (p. 230), plum (p. 287, incl cultivars), Plumbaginaceae (pp. 287–8, illus.), Poa (p. 299), Podophylleae (pp. 301–2, illus.), Podostemmaceae (p. 302), Poinciana aculeata (p. 306), Polemoniaceae (p. 333, illus.), pollen (p. 343), Polyadelphia (p. 346), Polyandria (p. 346), Polyanthes tuberosa (pp. 346–7), polyanthus (p. 347), polycotyledonous (p. 352), Polygalaceae (p. 352), polygamous (p. 352), Polygonaceae (p. 358), Polypodiaceae (pp. 373–4, illus.), pome (p. 379), Portulaceae (p. 442, illus.), Potentilla (p. 469).

Articles by Dickson.
Phlorizini (p. 98), physic nut (p. 130), Piper (p. 176), Piper cubeba (p. 176), Piper longum (p. 176), Piper nigrum (pp. 176–7), plumbagin (p. 287), poison (pp. 306–9)?, Polygala senega (p. 352), Polygonum bistorta (p. 359)..

Articles by Hickey.
Potato (pp. 465–8).

Articles by Rham.
Plough (pp. 271–8, illus.), pollards (p. 343).

Vol. XIX. Primaticcio – Richardson. 1841.

Articles by Lindley.
Primulaceae (p. 3, illus.), Prosopis (p. 55), Prunus (p. 68), Psidium (pp. 82–3), Psoralea (p. 94), Psyllium (pp. 95–6), Pterocarpus (p. 96), Pterolobium (p. 99), Pterospermum (p. 99), psychogens (p. 107), Psychotis (pp. 107–8), Puccinia (pp. 109–10), puccoon (p. 110), pulp (p. 124), pumpkin

(p. 126), Punica (p. 129), purslane (p. 136), quaking grass (p. 193), Quamoclit (p. 193), Quercus (pp. 211–7, illus.), quince (p. 221), Quisqualis (p. 225), Rafflesia (p. 241), ragwort (p. 245), rampion (p. 293), ramson (p. 295), Ramtilla (p. 295), Ranunculaceae (p. 299), Raphanus (p. 303), raspberry (p. 305), ratany (p. 306), rattle (p. 314), resins (p. 413), Restiaceae (pp. 419–20, illus.), Rhamnaceae (pp. 444–5, illus.), Rheum (pp. 449–50), Rhizomorpha (p. 476), Rhizophora (p. 476), Rhododendron (pp. 481–2).

Articles by Dickson.
Quercus pedunculatus (p. 217), quinia (pp. 220–1), Rhamnus catharticus (p. 445), Rheum, medical properties of (pp. 450–1), Rhus toxicodendron (pp. 485–6).

Articles by Lankester.
Rhus (pp. 484–5), Ribes (pp. 495–7).

Articles by Rham.
Rape (pp. 299–300), rat (p. 306), reaping (pp. 322–3).

Articles by Royle.
Prinsepia (p. 14), Putranjiva (p. 138), rambootan (p. 286).

Articles of uncertain authorship.
Raisins (pp. 274–5), rice (pp. 499–500).

Biographical articles on botanists.
Ray, John (pp. 317–9 – by Lindley, at least in part).

Vol. XX. Richardson – Scander-Beg. 1841.

Articles by Lankester.
Ricinus (p. 5), rings, fairy (p. 16), Robinia (pp. 45–6), rock-plants (p. 53), rock-work (pp. 53–4), root (pp. 152–3), Rosa (pp. 156–60), Rosaceae (pp. 160–1, illus.), Rosmarinus (p. 170), rostellum (p. 175), rostrum (p. 176), rotate (p. 176), Rottboella (p. 185), Rottlera (p. 186), rowan-tree (p. 196), Roxburghia (p. 197), Roydsia (p. 212), Roylea (p. 212), Rubus (pp. 215–6), Rudbeckia (p. 216), Ruellia (p. 217), Rumex (p. 221), Rumphia (p. 226), Ruppia (p. 229), Ruscus (p. 229), rush (p. 229), Ruta (p. 273), Rutaceae (pp. 273–4, illus.), Sabbatia (p. 297), Sabi (p. 298), Saccharum (p. 299), Saccolabium (p. 301), safflower (p. 309)?, saffron (p. 309), Sageretia (pp. 311–2), Sagina (p. 312), Sagittaria (p. 312), Salacia (p. 325), Salicaceae (pp. 352–4, illus.), Salicornia (p. 354), Salisburia (p. 357), Salix (pp. 358–60), Salsola (p. 368), Salvadora (p. 372), Salvadoraceae (p. 372), Salvia (pp. 372–3), Salviniaceae

(p. 373), Samadera (p. 375), Sambucus (p. 376), samphire (p. 383), Samyda (p. 383), Samydaceae (pp. 383–4, illus.), Sanguisorba (p. 395), Sanseviera (p. 404), Santalaceae (p. 406, illus.), Santalum (p. 407), sap (pp. 414–6), Sapindaceae (pp. 417–8, illus.), Sapindus (p. 418), Sapotaceae (pp. 418–9, illus.), Sarraceniaceae (p. 444, illus.), Sassafras (p. 449), Saururaceae (p. 468, illus.), Sauvagesieae (p. 469), Saxifraga (pp. 485–6), Saxifragaceae (pp. 486–7, illus.).

Articles by Dickson.
Ricinus communis (pp. 5–6), Rosa (possibly final paragraph of, pp. 159–60, though Pereira's *Materia medica* is cited), Rosmarinus officinalis (p. 170), Ruta graveolens (p. 273), sagapenum (p. 310), salicin (p. 354), Salix, medical properties of (pp. 360–1), santonin (p. 409), sassafras, medical properties of (p. 449).

Articles by Rham.
Rotation of crops (pp. 178–81), rushes (p. 231), Rutlandshire: section on agriculture (pp. 275–6), rye (pp. 281–3), rye-grass (p. 283), sainfoin (pp. 321–2).

Articles possibly by Royle.
Sago (p. 313), salep (pp. 345–6), sapan (p. 417), sarsaparilla, East Indian (pp. 444–5).

Vol. XXI. Scanderoon – Signet. 1841.

Articles by Lankester.
Scandix (p. 10), Scepaceae (pp. 19–20), Schoenanthus (p. 36), Schoepfia (p. 36), Scilla (p. 69), Scleranthaceae (p. 83), Scrophulariaceae (p. 115, illus.), sea-weeds (pp. 155–7), Seaforthia (p. 157), Secamone (p. 174), Sedum (pp. 182–3), seed (pp. 183–4), Selaginaceae (p. 205), Semecarpus (pp. 214–5), Senacia (p. 224), Senecio (p. 229), sensitive plants (pp. 247–8), sepal (p. 248), Seriana (p. 262), Sesamum (pp. 291–2), Sesbania (p. 292), Setaria (p. 299), sexes of plants (pp. 320–1), Shorea (p. 412), shrub (p. 446), Sibthorpia (pp. 475–6), Sideritis (pp. 490–1), Sideroxylon (p. 491), Sigillaria (p. 508).

Articles by Dickson.
Secretions, vegetable (pp. 177–9).

Articles by Rham.
Scythe (pp. 145–6).

Articles of uncertain authorship.
Sibthorp (p. 475).

Vol. XXII. Sigonio – Steam-vessel. 1842.

Articles by Lankester.

Silenaceae (p. 2), Silene (pp. 2–3), silicula (p. 9), siliqua (p. 9), silver-grain (p. 26), Simarubaceae (p. 26, illus.), Sinapis (pp. 35–6), Siphonia (p. 47), Sison (p. 63), Sisymbrium (pp. 63–4), Sium (p. 65), sleep: section on sleep of plants (p. 129), Sloanea (p. 141), Smeathmannia (p. 144), Smilaceae (p. 146), Smilax (pp. 146–7), Smithia (p. 153), Smyrnium (p. 161), Sodada (p. 184), sola (p. 194), solanaceae (pp. 194–5, illus.), Solandra (p. 195), Solanum (pp. 195–6), Sollya (p. 209), Sonchus (p. 240), Sonneratia (p. 246), Sophora (p. 259), Sorghum (p. 266), sorus (p. 266), soya (p. 280), Soymida (p. 280), spadix (p. 282), Sparganium (p. 310), spartum (p. 321), spathe (p. 321), species of plants (p. 323), Spergula (p. 333), Spermadictyos (p. 334), Spermoedia (p. 334), Sphaeralcea (p. 336), Sphaeranthus pp. 336–7), Sphaeria (p. 337), Sphaerocarya (p. 337), Sphaerococcus (p. 337), Sphagnum (pp. 337–8), Sphenoclea (p. 338), Sphenocleaceae (p. 338), Sphenopteris (pp. 338–9), Spigelia (pp. 345–6), Spigeliaceae (p. 346), spike (p. 346), spikenard (pp. 346–7), Spinacia (p. 348), spine (p. 348), Spiraea (pp. 353–4), spiral structures in plants (pp. 354–6), Splachnum (pp. 363–4), Spondiaceae (p. 370, illus.), spongiole (p. 377), sporangium (p. 378), Sporendonema (p. 378), sporocarpium (pp. 378–9, illus.), sporules (p. 379), squama (p. 393), Squilla (p. 396), Staavia (p. 402), Stachys (p. 403), Stachytarpha (pp. 403–4), Stackhousia (p. 404, illus.), Stagmaria (pp. 422–3), stamens (p. 427), Stauntonia (p. 471).

Articles by Dickson.

Simaruba (p. 26), Sinapis (p. 36), Smilax (pp. 147–8), solanina (p. 195), Solanum dulcamara (pp. 196–7), Spigelia marylandica (p. 346).

Articles by Rham.

Soil (pp. 187–92, illus.), soiling (pp. 192–3), Somersetshire: section on agriculture (pp. 221–2), sowing and sowing-machines (pp. 278–80, illus.), Staffordshire: section on agriculture (pp. 412–4), stall-feeding (pp. 426–7).

Articles of uncertain authorship.

Sintoc (pp. 45–6).

Biographical articles on botanists.

Solander (p. 195).

Vol. XXIII. Stearic acid – Tagus. 1842.

Articles by Lankester.

Stellaria (p. 11), Stellatae (p. 11), stem (pp. 19–20), Sterculia (p. 40), Sterculiaceae

(pp. 40–1, illus.), stigma (pp. 53–4), Stilaginaceae (p. 54), Stilago (p. 54), Stilbaceae (p. 54), Stillingia (p. 57), stings (p. 58), stipes (pp. 58–9), stipules (p. 59), stomates (pp. 84–6), strawberry (pp. 111–2), Strychnos (pp. 152–3), Stylidiaceae (pp. 178–9, illus.), Stylidium (p. 179), Styraceae (p. 180, illus.), Styrax (pp. 180–1), succory (p. 200), Succulatea (p. 200), sun-flower (pp. 286–7), Surianaceae (p. 309), sweet calamus (pp. 403–4), Swietenia (p. 404), Symphoricarpos (pp. 447–8), Symphytum (p. 418), Symplocos (p.418), Syriniga (pp. 478–9), Syringodea (p. 479), Syzyium (p. 483), Tabernaemontana (p. 494), Tacca (p. 503), Taccaceae (p. 503).

Articles by Dickson.
Strychnia (p. 152), Strychnos nux-vomica (pp. 153–5), Styrax officinalis (p. 181).

Articles by Rham.
Suffolk: section on agriculture (pp. 212–4), Surrey: section on agriculture (pp. 312–5).

Articles of uncertain authorship.
Submarine forests (pp. 193–4), Swartz (pp. 376–7), Tabernaemontanus (p. 494).

Vol. XXIV. Tai-wan – Titlarks. 1842.

Articles by Lankester.
Tamaricaceae (pp. 23–4, illus.), Tamarindus (p. 24), Tamarix (pp. 24–5), Tamus (p. 26), Tanacetum (p. 27), Tanghinia (p. 31), Taxaceae (p. 117), Taxodium (p. 120), Taxus (pp. 120–1), Tectona (p. 141), temperature of plants (pp. 177–8), tendrils (p. 202), Tephrosia (pp. 217–8), Terebintaceae (p. 220), Terminalia (p. 231), Ternströmiaceae (p. 235, illus.), tetradynamous (p. 254), Tetragoniaceae (p. 254), Tetragonolobus (p. 254), Teucrium (p. 260–1), thalamus (p. 274), thalassiophytes (p. 277), Thalictrum (p. 278), thallus (p. 278), Thapsia (p. 282), Thea (pp. 284–7), theca (p. 303), Theobroma (p. 312), Theophrasta (p. 332), Thespesia (p. 353), Thuja (pp. 409–10), Thymelaceae (p. 419, illus.), Thymus (p. 419), Tilia (p. 446–8), Tiliaceae (p. 448, illus.), Tillandsia (pp. 449–50), tissues, vegetable (pp. 499–505).

Articles by Dickson.
Tamarinds, medical properties of (p. 24), Thea, medical and dietetical properties (pp. 287–9: presumably excluding the section on the tea trade, pp. 289–91).

Articles by Rham.
Tank (pp. 34–6), tare (pp. 58–60), team (pp. 136–8), teazle (pp. 138–9), thatch (pp. 283–4), thistle (p. 384), thrashing (pp. 398–9), tillage (pp. 448–9), timothy-grass (p. 466).

Articles of uncertain authorship.

Tea, Paraguay, or maté (p. 135), Theobroma: cocoa and chocolate (pp. 312–3), timber-trade (pp. 456–7), timber and timber-trees (pp. 457–8).

Biographical articles on botanists.

Theophrastus (pp. 332–4, section on botany p.334; the remainder possibly by Wilhelm Adolf Becker?), Thunberg (pp. 410–11).

Vol. XXV. Titles of honour – Ungula. 1843.

Articles by Lankester.

Toon-wood: paragraph on Cedrela (p. 42), Torenia (p. 45), Tormentilla (pp. 48–9), Tournefortia (p. 92), Trachytella (p. 109), Tradescantia (pp. 112–3), Tragacanth: at least part of (pp. 113–4), Tragia (p. 114), Tragopogon (p. 114), Trapa (pp. 165–6), Tree, cotton (p. 181), Tramandraceae (pp. 181–2, illus.), Tremellini (pp. 182–3), Trewcaceae [sic] (p. 198), Trianthema (p. 199), Tribulus (p. 200), Trichilia (p. 203), Trichodermaceae (p. 204), Trichodesma (p. 204), Trichosanthis (p. 204), Trichospermi (pp. 204–5), Tricoccae (p. 205), Trientalis (pp. 207–8), Trifolium: excluding Rham's portion (pp. 210–1), Triglochin (pp. 211–2), Trigonella (p. 212), Trinia (p. 237), Triphasia (p. 248), Trisetum (pp. 260–1), Triticum (pp. 261–3), Trollius (p. 296), Tropaeoleae (pp. 301–2, illus., citing Lindley's system), Tropaeolum (p. 302), Tuberaceae (pp. 328–9), Tubercularini (p. 329), tulip-tree (pp. 341–2), Tulipa (pp. 342–4), Turneraceae (p. 418, illus.), turnip (p. 427), turpentine tree (pp. 430–1), Turpinia (p. 434), Turraea (p. 434), Tussilago (pp. 445–6), Tylophora (p. 451), Typhaceae (pp. 456–7, illus.), Typhonium (p. 458), Ulex (pp. 487–8), Ulmaceae (pp. 489–91, illus.), Ulmus (pp. 491–4), Ulvaceae (pp. 407–8), umbel (p. 498), Umbelliferae (pp. 498–9, illus.), Uncaria (pp. 508–9).

Articles by Dickson.

Tormentil (p. 48), Ulmus campestris (p. 494).

Articles by Rham.

Tobacco: section on cultivation (pp. 16–17), Trifolium: paragraphs on cultivation, from "It is an annual of rapid growth" to "taken into consideration" (p. 210), turf (pp. 388–9), turnips (pp. 427–9).

Articles of uncertain authorship.

Tobacco (pp. 15–19, excluding Rham's section).

Biographical articles on botanists.

Tournefort (pp. 90–2), Tradescant (p. 112), Tragus (pp. 114–5).

Vol. XXVI. Ungulata – Wales. 1843.

Articles by Lankester.

Unona (p. 31), Urania (p. 39), Urceola (p. 46), Urceolaria (p. 46), Uredo (pp. 47–8), Urena (p. 48), Urtica (p. 62), Urticaceae (pp. 62–4, illus.), Usnea (p. 69), Utricularia (p. 71), utriculus (p. 71), Uvaria (p. 71), Uvularia (pp. 71–2), Vaccinaceae (p. 74, illus.), Vaccinium (pp. 74–5), Vahea (p. 81), Vahlia (p. 81), Valeriana (pp. 91–2), Valerianaceae (pp. 92–3, illus.), Valerianella (pp. 93–4), Vallaris (p. 96), Vallisneria (p. 100), valve (p. 105), Vanda (p. 109), Vandellia (p. 109), Vangueria (p. 115), Vanilla (pp. 115–7), Vanillaceae (p. 117, illus.), varieties (pp. 142–4), Variolaria (pp. 145–6), varnish-trees (p. 147), vascularies (p. 149), Vateria (p. 152), Vaucheria (pp. 157–8), vegetable wax (p. 180), vegetables / vegetable kingdom (pp. 180–4), Ventilago (p. 245), Veratrum (p. 251), Verbascinae (pp. 253–4), Verbena (p. 254), Verbenaceae (pp. 254–5, illus.), vernation (p. 264), Vernonia (p. 268), Vernoniaceae (p. 268), Veronica (pp. 271–2), Verrucaria (p. 274), verticillus (p. 278), Viburnum (pp. 293–4), Vicieae (pp. 296–8), Vicoa (p. 299), Villarsia (pp. 313–2), Vinca (p. 336), Viola (pp. 343–5), Violaceae (p. 345, illus.), Virgilia (p. 355), Virola sebifera (p. 373), Vitaceae (pp. 392–3, illus.), Vitex (p. 397), Vitis (pp. 397–9), vittae (p. 403), Voandzeia (p. 516), Vochyaceae (pp. 516–7), Volkameria (pp. 429–30), volva (p. 451), Wachendorfia (p. 478), Wahlenbergia (pp. 491–2).

Articles by Dickson.

Valeriana officinalis (p. 92), veratria (p. 251), Veratrum album (pp. 251–2),

Articles by Rham.

Uredo: paragraphs on Uredo as fungal pest, from "As the diseases…" to "same quantity" (pp. 47–8), vineyard (pp. 342–3).

Articles of uncertain authorship.

Vegetable ivory (pp. 179–80), vittie-vayr (p. 403), walan (pp. 497–8).

Biographical articles on botanists.

Vaillant (pp.82–4).

Vol. XXVII. Wales – Zygophyllaceae. 1843.

Articles by Lankester.

Wall-cress (p. 30), wall-flowers (p. 30), wall-pellitory (p. 30), walnut-tree (pp. 43–5), Waltheria (p. 53), water-lily (pp. 114–5), water-plants (pp. 116–8), Weinmannia (p. 208), Westringia (p. 262), willow-herb (p. 409), Willughbeia (p. 409), Wilsonia (p. 414), wine: horticultural portion (pp. 455–8)?, winter-berry (p. 473), winter-cherry (p. 473), winter-green (pp. 473–4), Winteraceae (pp. 474–5, illus.), Wistaria (pp. 485–6), Witheringia (p. 494), Wittelsbachia (p. 498), Wrightia

(pp. 589–90), wych-hazel (p. 603), Wydleria (pp. 607–8), Xanthium (p. 615), xanthophyll (p. 616), Zanthorhiza (p. 616), Xanthoxylaceae (pp. 716–9, illus.), Ximenia (p. 627), Xylocarpus (p. 634), Xyloma (p. 635), Xylomelum (pp. 635–7, illus.), Xylophylla (p. 639), Xylopia (pp. 639–40, citing Lindley), Xyridaceae (p. 640, illus.), Yucca (p. 725), Zamia (pp. 731–2), Zannichellia (p. 738), Zanonia (p. 738), Zea (p. 724), Zingiberaceae (pp. 783–4, illus.), Zinnia (pp. 784–5), Zizania (p. 789), Zizyphus (pp. 789–90), Zygnema (pp. 829–30), Zygophyllaceae (pp. 830–1, illus.).

Articles by Rham.

Warping (pp. 72–3), Warwickshire: section on agriculture (pp. 86–7), weeds (pp. 187–9), Westmoreland: section on agriculture (pp. 252–3), wheat [excluding section on corn-trade] (pp. 301–4, illus.), Wiltshire: section on agriculture (pp. 419–22), woad (pp. 499–500), woods (pp. 541–3), Worcestershire: section on agriculture (pp. 562–4), Yorkshire: section on agriculture (pp. 684–9, excluding lists of market dates).

Articles of uncertain authorship.

Wood (pp. 518–20), woods and forests (pp. 543–4).

Biographical articles on botanists.

Willdenow (pp. 395–6), Withering (pp. 493–4), Woodville (pp. 544–5, probably by Dickson).

The illustrations for the botanical articles in the *Penny Cyclopaedia*

Brent Elliott
c/o The RHS Lindley Library, The Royal Horticultural Society, London

Many, though not all, of the botanical articles were illustrated with woodcut plant portraits. In a few cases – the entries for Fungi and Grasses in particular – the text was filled with a number of small diagrams. In most cases there was a single image: a particular species of the genus or family described; so, for instance, the article on *Ebenaceae* was illustrated with a figure of *Diospyros lotus*, and that on *Winteraceae* with a figure of *Drimys chilensis* (now *D. winteri*).

The images are generally highly competent botanical illustrations, for the most part including dissections. Who drew the images? In a few instances the text specifies a source: sketches by William Westall for *Banksia*, Lindley himself for *Hebradendron*. (In that latter case, the dissections were copied, with right-to-left reversal, from Hooker's *Companion to the Botanical Magazine*; in the absence of an original drawing, we cannot now tell whether Lindley copied these details himself, or whether the maker of the woodblock was instructed to add the details, Lindley having furnished only the primary plant portrait.) But in the overwhelming majority of cases there are no attributions to artist or to source.

It should come as no surprise that a large number of the images were copied from existing published illustrations. The exigencies of publishing parts on a weekly basis, and keeping costs down, would have militated against the hiring of professional artists skilled in the depiction of such a range of subjects as an encyclopaedia required. It is remarkable, in fact, not merely that so many of the woodcuts were not copied from existing literature (as far as I have so far traced), but that in several cases there were no previously published illustrations of the plants under the names assigned. Among the plant names for which the *Index Londinensis* records no previous depictions are *Cassia elongata*, *Connarus asiaticus*, *Podocarpus aspleniifolia*, *Quercus rigida*, and *Xanthoxylum pterota*. For *Talauma pumila*, apart from an illustration in Blume which was not copied, the *Index Londinensis* records no further illustrations until 1861. The possibility must not be dismissed that Lindley's own sketches may have been the basis for many more woodcuts than he was given credit for

in the text. This is likely to be the case with the sequence of leaf patterns shown in the entries on *Acer* and *Quercus*; I cannot think of any previous source that gave such a handy comparative study of these genera by leaf type. And it is almost certain to be the case for the figures of anatomical parts of orchids, in the entry for *Orchidaceae*.

Table 1 gives a list of the illustrations of flowering plants in the *Penny Cyclopaedia,* and shows the sources that have so far been traced. In some cases (Blume, Palisot de Beauvois, J.E. Smith), Lindley's own copies of the relevant works are now in the Lindley Library, so there is no ambiguity about their accessibility for him. But the single work that was most frequently copied for the *Cyclopaedia*'s botanical images was the botanical portion of the *Dictionnaire des Sciences Naturelles*, for which Turpin had done two volumes of plates, and Lindley did not have a copy of this work (the Lindley Library now holds a copy, but it was only acquired in 1996). In most cases, the copying was fairly exact, without right-to-left reversal of the image, but in many other cases the images show reversal, or the dissection details do. (Perhaps the publishers of the *Cyclopaedia* had a house copy of the entire *Dictionnaire* from which to work.)

Nearly all the palm portraits were copied from Martius' *Historia Naturalis Palmarum.* The details of grasses were taken from Palisot de Beauvois' *Essai d'une Nouvelle Agrostographie*; in Lindley's copy, the plates have been cut up, and the individual figures pasted opposite the relevant text entries – perhaps during the course of work on the *Cyclopaedia*? Two illustrations were copied from Sibthorp's *Flora Graeca*, of which Lindley was editing the final volumes when he was contributing to the *Cyclopaedia*. Most of the other works drawn on for the images dealt with tropical plants, which might predictably be less likely to be discovered in cultivation, even in a botanic garden. It is surprising that only a couple of images were copied from the *Botanical Register,* which Lindley was editing at the time.

There are few nomenclatural tangles associated with these woodcuts. The image for *Cuscuta minor* was copied from the Turpin illustration of *Cuscuta europaea*. The illustration for *Hippocratea* does not name the species depicted; it was copied from the Turpin illustration of *H. scandens*. The entry for *Urticaceae* is illustrated with a picture of *Boehmeria caudata*, mislabelled *B. cordata*. The ginkgo is given the name *Salisburia adiantifolia*; Lindley was not alone in using this name, which after all honoured R.A. Salisbury, one of the founders of the Horticultural Society. Other than these, while many names have subsequently been changed,

[Buttneria inodora.]

1, a complete flower seen from above; the outer pentagon is calyx; the auricled bodies are petals, and the 5 rayed centre represents the 5 sterile stamens; 2, is the calyx cut open, with the stamens attached to it; 3, is a longitudinal section of a flower, showing the origin of the petals; 4, a petal; 5, a calyx seen from above, with the young fruit cut transversely, and the hooked hairs with which it is covered projecting from its sides; 6, a stamen; 7, the ovary.

Fig. 3. **Engraving of *Buttneria inodora* taken from *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge*, Volume 6.**

Fig. 4. **Engraving of *Buttneria inodora* by P.J.F. Turpin, taken from *Dictionnaire des sciences naturelles*, 1816–1829.**

RHS, LINDLEY LIBRARY

Fig. 5. **Plate 41 from Volume 2 of *Historia naturalis palmarum* by Carl Friedrich Philipp von Martius (1794–1868).**

Fig. 6. **Engraving of *Attalea compta* taken from *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge*.**

there is little evidence of either carelessness or controversy in the names assigned.

There are more illustrations to be considered than those for flowering plants. Table 2 lists the illustrations of cryptogamic plants. So far, the only one of these for which I have traced a source is the illustration for *Jungermanniaceae*, copied from Hooker's portrait of *Jungermannia nemorosa*, plate 21 in his *British Jungermanniae* (1812–16).

The entry on Coal Plants contains fourteen small woodcuts of fossil plants, and the entry for *Otopteris* contains a figure with details of four species. During the first years of working on the *Cyclopaedia*, Lindley was also compiling, in collaboration with William Hutton, *The Fossil Flora of Britain* (1831–37); this was the first English work on the subject (Chaloner, 1999). Five of the illustrations in these two entries were copied from plates in the *Fossil Flora*; see Table 3 for details.

There are also a few portraits of famous trees (see Table 4), and botanical diagrams (see Table 5).

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* and their sources (see p. 53 for key).**

Plant	Modern name if different	Article	Vol. & page	Source
Abies brunoniana – cone*	*Tsuga brunoniana*	Abies	I p. 31	
Abies excelsa	*Picea excelsa*	Abies	I p. 31	
Abies smithiana – cone*	*Picea smithiana*	Abies	I p. 31	
Abies douglasii – cone	*Pseudotsuga menziesii*	Abies	I p. 32	
Abies cedrus	*Cedrus libani*	Abies	I p. 33	
Abies larix	*Larix decidua*	Abies	I p. 33	
Acacia arabica		Acacia	I p. 60	
Acacia catechu		Acacia	I p. 60	
Acacia sophorae	*Acacia longifolia*	Acacia	I p. 61	
Acanthus spinosus		Acanthus	I p. 69	Sibthorp 7: 611
Acer barbatum	*Acer saccharum*	Acer	I p. 76	
Acer creticum	*Acer monspessulanum*?	Acer	I p. 76	
Acer monspessulanum		Acer	I p. 76	
Acer obtusatum		Acer	I p. 76	
Acer opulus [sic]	*Acer opalus*	Acer	I p. 76	
Acer striatum		Acer	I p. 76	
Acer tataricum (leaves only)		Acer	I p. 76	
Acer caudatum		Acer	I p. 77	
Acer eriocarpon [sic]	*Acer saccharum*	Acer	I p. 77	
Acer lobelii	*Acer cappadocicum* subsp. *lobelii*	Acer	I p. 77	
Acer rubrum		Acer	I p. 77	
Acer saccharinum		Acer	I p. 77	
Acer spicatum (leaves only)		Acer	I p. 77	
Acer obtusatum	*Acer opalus* subsp. *obtusatum*	Acer	I p. 77	
Acer opulus [sic]	*Acer opalus*	Acer	I p. 77	
Acer sterculiaceum (leaves only)				
Acer caudatum		Acer	I p. 78	
Acer circinatum		Acer	I p. 78	
Acer villosum (leaves only)	*Acer sterculiaceum*	Acer	I p. 78	
Acer macrophyllum (leaf only)		Acer	I p. 78	
Aconitum napellus		Aconitum	I p. 88	
Acorus calamus		Acorus	I p. 89	
Adansonia digitata		Adansonia	I p. 113	

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Adansonia digitata		Adansonia	I p. 114	
Aesculus hippocastanum		Aesculus	I p. 155	
Aethusa cynapium		Aethusa	I p. 159	
Agave americana		Agave	I p. 198	
Agrimonia eupatoria		Agrimonia	I p. 220	
Agrostis alba		Agrostis	I p. 222	
Alisma plantago		Alismaceae	I p. 341	
Aloe socotrina [sic]	*Aloe succotrina*	Aloe	I p. 371	
Alopecurus pratensis		Alopecurus	I p. 376	
Althaea officinalis		Althaea officinalis	I p. 403	
Amaranthus polygamus	*Amaranthus tricolor*	Amarantaceae	I p. 413	
Amaryllis reticulata	*Hippeastrum reticulatum*	Amaryllidaceae	I p. 414	Turpin Monocot. 53
Amomum cardamomum	*Amomum cardamon*	Amomum	I p. 461	
Amomum grandiflorum	*Amomum granum-paradisi*	Amomum	I p. 461	Smith 2: 111
Anacardium occidentale		Anacardiaceae	I p. 484	
Duvaua dependens	*Schinus dependens*	Anacardiaceae	I p. 484	
Angelica archangelica		Angelica	II p. 14	
Anona squamosa	*Annona squamosa*	Anonaceae	II p. 53	Turpin Dicot. 118
Anona muricata	*Annona muricata*	Anonaceae	II p. 54	
Anthoxanthum odoratum		Anthoxanthum	II p. 96	
Antiaris macrophylla		Antiaris	II p. 98	
Panax quinquefolium		Araliaceae	II p. 238	Turpin Dicot. 113
Araucaria excelsa		Araucaria	II p. 249	
Areca catechu		Areca	II p. 297	
Areng saccharifera	*Arenga saccharifera*	Areng	II p. 299	Martius P. 3: 108
Aristolochia sipho		Aristolochiae	II p. 328	Turpin Dicot. 2
Arum maculatum		Aroideae	II p. 385	Turpin Monocot. 3

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Arracacha [sic = *Arracacia*] *esculenta*	*Arracacia xanthorrhiza*	Arracacia	II p. 389	
Artocarpus incisa	*Artocarpus incisus*	Artocarpus	II p. 421	Turpin Dicot. 286
Asclepias syriaca		Asclepiadaceae	II p. 440	Turpin Dicot. 58–59
Ornithogalum fimbriatum		Asphodeleae	II p. 490	
Astrocaryum murimuri	*Astrocaryum murumura*	Astrocaryum	II p. 524	Martius P. 2: 58
Atropa belladonna		Atropa	III p. 48	
Atropa mandragora	*Mandragora officinalis*	Atropa	III p. 48	Sibthorp 3: 232
Attalea compta		Attalea	III p. 54	Martius P. 2: 41
Kingia australis & *Xanthorrhoea* sp.		Australia, botany of	III p. 124	
Pandanus sp.		Australia, botany of	III p. 124	
Babiana sulphurea		Babiana	III p. 226	
Bactris acanthocarpa		Bactris	III p. 254	Martius P. 2: 70
Balanophora sp.		Balanophoreae	III p. 310	
Impatiens noli tangere	*Impatiens noli-tangere*	Balsamineae	III p. 344	Turpin Dicot. 134
Balsamodendron myrrha	*Commiphora myrrha*	Balsamodendron	III p. 345	
Banksia spp.		Banksia	III p. 405	Westall [sketch]
Bassia butyracea		Bassia	IV p. 2	
Batatas edulis	*Ipomoea batatas*	Batatas	IV p. 19	
Bauhinia porruta [sic]	*Bauhinia porrecta*	Bauhinia	IV p. 48	
Begonia sp.		Begonia	IV p. 163	
Belvisia caerulea	*Napoleonaea imperialis*	Belvisiaceae	IV p. 206	
Berberis vulgaris		Berberidaceae	IV p. 260	Turpin Dicot. 119 (rev)
Bertholletia excelsa		Bertholletia	IV p. 323	Humboldt 1: 36
Betula alba		Betula	IV p. 348	
Bignonia lactiflora	*Distictis lactiflora*	Bignoniaceae	IV p. 391	Turpin Dicot. 52 (rev)

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Bixa orellana		Bixa	IV p. 475	Turpin Dicot. 149 (rev)
Pulmonaria angustifolia		Borageneae	V p. 173	Turpin Dicot. 45 (rev)
Borassus flabelliformis	*Borassus flabellifer*	Borassus	V pp. 173, 174	Martius P. 3: 108
Butomus umbellatus		Butomaceae	VI p. 65	Turpin Monocot. 44
Buttneria [sic = *Byttneria*] *inodora*	*Rulingia pannosa*?	Buttneriaceae	VI p. 69	Turpin Dicot. 140 (rev)
Melocactus communis		Cactus	VI p. 97	
Campanula rapunculoides		Campanulacae	VI p. 201	
Capparis spinosa		Capparidaceae	VI p. 272	
Caprifolium perfoliatum		Caprifoliaceae	VI p. 274	
Lychnis grandiflora		Caryophyllaceae	VI p. 333	Turpin Dicot. 191 (rev)
Caryophyllus aromaticus	*Eugenia caryophyllata*	Caryophyllus aromaticus	VI p. 334	Turpin Dicot. 222 (rev)
Caryota urens		Caryota	VI p. 335	Martius P. 3: 108
Caryota urens [spadix]		Caryota	VI p. 335	Martius P. 3: 107
Casuaracea [sic] *quadrivalvis*	*Casuarina stricta*	Casuaraceae	VI p. 358	Turpin Dicot. 299 (rev)
Casuaracea [sic] *quadrivalvis*	*Casuarina stricta*	Casuaraceae	VI p. 359	Turpin Dicot. 300
Euonymus atropurpureus		Celastraceae	VI p. 399	Turpin Dicot. 272 (rev)
Ceratonia siliqua		Ceratonia siliqua	VI p. 433	
Ceroxylon andicola		Ceroxylon andicola	VI p. 439	Humboldt 1: 1
Chailletia pedunculata		Chailletiaceae	VI p. 462	Turpin Dicot. 247 (rev)
Cheirostemon platanoides		Cheirostemon platanoides	VII p. 28	Turpin Dicot. 139 (part)
Blitum virgatum	*Chenopodium foliosum*	Chenopodiaceae	VII p. 38	Turpin Dicot. 19
Chloranthus officinalis		Chloranthaceae	VII p. 105	Blume J. Chloranteae: 1

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Sarcolaena multiflora		Chlenaceae	VII p. 105	Turpin Dicot. 146
Chrysobalanus icaco		Chrysobalanaceae	VII p. 137	Turpin Dicot. 236
Cicuta virosa		Cicuta virosa	VII p. 160	
Cinchona condaminea	*Cinchona officinalis*	Cinchona	VII p.169	Humboldt 1: 10 (rev)
Cinchona humboldtiana		Cinchona	VII p.170	
Cinchona scrobiculata		Cinchona	VII p.170	Humboldt 1: 47 (rev)
Cinnamomum zeylanicum		Cinnamomum	VII p. 177	
Cistus creticus		Cistaceae	VII p. 212	
Erythroxylon coca		Coca	VII p. 305	
Cocculus palmatus	*Jateorhiza columba*?	Cocculus	VII p. 306	
Cocos nucifera		Cocos	VII p. 313	Martius P. 2: 62 (rev)
Coffea arabica		Coffea	VII p. 322	Turpin Dicot. 99
Columellia oblonga		Columellaceae	VII p. 381	Ruiz 1: 8
Combretum coccineum		Combretaceae	VII p. 392	Turpin Dicot. 221
Tradescantia virginiana		Commelinaceae	VII p. 398	Turpin Monocot. 38
Conium maculatum (fruit)		Conium maculatum	VII p. 454	
Podocarpus asplenifolia	*Phyllocladus asplenifolius*	Coniferae	VII p. 454	
Salisburia adiantifolia	*Ginkgo biloba*	Coniferae	VII p. 454	
Connarus asiaticus	*Connarus monocarpus*	Connaraceae	VII p. 458	
Copaifera officinalis		Copaifera officinalis	VII p. 497	
Coriandrum sativum		Coriandrum sativum	VIII p. 11	
Coriaria myrtifolia		Coriariaceae	VIII p. 11	
Cornus mas		Cornaceae	VIII p. 23	Turpin Dicot. 103 (rev)
Corylus avellana		Corylaceae	VIII p. 73	Turpin Dicot. 303 (part, rev)

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Coumarouna odorata	*Dipteryx odorata*	Coumarouma odorata	VIII p. 106	Aublet 296 (rev)
Sempervivum villosum	*Sempervivum lindleyi*?	Crassulaceae	VIII p. 141	
Croton tiglium		Croton	VIII p. 179	
Crozophora tinctoria		Crozophora tinctoria	VIII p. 183	
Cheiranthus cheiri		Cruciferae	VIII p. 184	Turpin Dicot. 182
Momordica balsamina		Cucurbitaceae	VIII p. 213	Turpin Dicot. 208–9
Cuminum cyminum		Cuminum cyminum	VIII p. 231	
Weinmannia jubescens [sic]	*Weinmannia pubescens*	Cunoniaceae	VIII p. 231	Turpin Dicot. 198
Cuscuta minor		Cuscutaceae	VIII p. 239	Turpin Dicot. 49 (part)
Cycas circinalis		Cycadaceae	VIII p. 247	Turpin Dicot. 310–11 (part)
Cyclanthus bipartitus		Cyclanthaceae	VIII p. 248	Turpin Monocot. 5–6 (part)
Cynosurus cristatus		Cynosurus cristatus	VIII p. 253	
Cyperus fuscus		Cyperaceae	VIII p. 254	Turpin Monocot. 12 (part)
Streptocarpus rexii		Cyrtandraceae	VIII p. 267	
Cytinus hypocistis		Cytinaceae	VIII p. 269	Turpin Dicot. 3 (part)
Dactylis glomerata		Dactylis glomerata	VIII p. 282	
Datisca cannabina		Datiscaeae	VIII p. 313	
Hibbertia volubilis		Dilleniaceae	VIII p. 497	Turpin Dicot. 116 (part)
Rajania cordata		Dioscoreaceae	IX p. 4	Turpin Monocot. 50 (part, rev)
Dipsacus fullonum		Dipsaceae	IX p. 12	
Dipterocarpus gracilis		Dipteraceae	IX p. 14	Blume J. Dipterocarpeae 5
Drosera rotundifolia		Droseraceae	IX p. 157	
Diospyrus lotus		Ebenaceae	IX p. 254	Turpin Dicot. 65 (part)

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Echinocactus eyriesii		Echinocactus	IX p. 262	Bot.Reg. 20: 1707 loosely
Beurreria succulenta	*Bourreria succulenta*	Ehretiaceae	IX p. 318	
Alfonsia oleifera	*Elaeis melanococca*	Elaeis	IX p. 324	Martius P. 2: 33
Elaeagnus angustifolia		Elaeagnaceae	IX p. 324	Turpin Dicot. 7
Elaeocarpus cyaneus		Elaeocarpaceae	IX p. 325	Turpin Dicot. 148
Empetrum rubrum		Empetraceae	IX p. 383	Bot.Reg. 21: 1783 (part)
Barbacenia (stem anatomy)		Endogens	IX p. 396	
Sprengelia incarnata		Epacridaceae	IX p. 465	Turpin Dicot. 73 (part)
Equisetum fluviatile		Equisetaceae	IX p. 492	Turpin Acot. 102
Erica longiflora		Ericaceae	IX p. 504	Turpin Dicot. 68
Eriocaulon dendroideum [sic = *dendroides*]	*Paepalanthus dendroides?*	Eriocauloneae	IX p. 508	Turpin Monocot. 41
Erythroxylon laurifolium	*Erythroxylum laurifolium*	Erythroxyleae	X p. 7	Turpin Dicot. 167 (part)
Escallonia serrata		Escalloniaceae	X p. 10	Turpin Dicot. 74 (part, rev)
Andrachne telephioides		Euphorbiaceae	X p. 70	
Euphorbia officinarum		Euphorbia	X p. 70	Turpin Dicot. 275 (part)
Francoa sonchifolia		Francoaceae	X p. 448	
Frankenia pulverulenta		Frankeniaceae	X p. 448	
Corydalis lutea		Fumariaceae	XI p. 14	Turpin Dicot. 176
Sherardia arvensis		Galiaceae	XI p. 40	Turpin Dicot. 98
Gentiana lutea		Gentianaceae	XI p. 121	Turpin Dicot. 55
Geranium pratense		Geraniaceae	XI p. 181	Turpin Dicot. 131
Gesnera [sic] *grandis*	*Rhytidophyllum grande*?	Gesneraceae	XI p. 204	Turpin Dicot. 77 (part)
Globularia longifolia	*Globularia salicina?*	Globulariaceae	XI p. 263	Turpin Dicot. 28

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Glycyrhiza glabra	*Glycyrrhiza glabra*	Glycyrhiza	XI p. 278	
Goodenia ovata		Goodeniaceae	XI p. 304	Turpin Dicot. 81 (part)
Gossypium barbadense		Gossypium	XI p. 315	Bot.Reg. 1: 84 loosely, with part reversal for details
Ribes grossularia	*Ribes uva-crispa*	Grossulaceae	XI p. 457	
Guaiacum officinale		Guaiacum	XI p. 463	
Clusia rosea		Guttiferae	XI p. 502	Turpin Dicot. 155–6
Juniperus oxycedrus		Gymnosperms	XI p. 510	
Oryza		Grasses	XI p. 346	Palisot 7 fig. 7
Phleum		Grasses	XI p. 346	Palisot 7 fig. 4
Stipa sp.		Grasses	XI p. 346	
Streptostachys		Grasses	XI p. 346	Palisot 10 fig. 11
Apera		Grasses	XI pp. 347	Palisot 7 fig. 11
Briza sp.		Grasses	XI pp. 347	Palisot 14 fig. 3
Calamagrostis sp.		Grasses	XI pp. 347	Palisot 5 fig. 9 loosely
Chloris sp.		Grasses	XI pp. 347	Palisot 16 fig. 6
Danthonia		Grasses	XI pp. 347	Palisot 18 fig. 7
Enneapogon		Grasses	XI pp. 347	Palisot 16 fig. 11
Hordeum		Grasses	XI pp. 347	Palisot 21 fig. 1
Pogonatherum		Grasses	XI pp. 348	Palisot 11 fig. 7
Rottboella sp.	*Rotboellia*	Grasses	XI pp. 348	Palisot 21 fig. 8
Wachendorfia thyrsoidea [sic]	*Wachendorfia thyrsiflora*	Haemodoraceae	XII p. 3	Turpin Monocot 59
Hippuris vulgaris		Halorageae	XII p. 23	Turpin Dicot. 220
Hebradendron cambogioides	*Garcinia morella*?	Hebradendron	XII p. 91	Comp. BM 2: 27 (rev) for details; Lindley for main figure

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Henslovia pubescens	*Crypteronia pubescens*?	Hensloviaceae	XII p. 136	Wallich 3: 221 (details rev)
Hippocratea sp.		Hippocrateaceae	XII p. 241	Turpin Dicot. 162
Hippomane mançanilla	*Hippomane mancinella*	Hippomane mançanilla	XII p. 244	Turpin Dicot. 278
Homalium racemosum	*Homalium racemosa*	Homaliaceae	XII p. 273	Turpin Dicot. 244 (part)
Humulus lupulus		Humulus lupulus	XII p. 342	
Hydrocharis morsus ranae	*Hydrocharis morsus-ranae*	Hydrocharaceae	XII p. 386	Turpi Monocot. 77
Hydrolea spinosa		Hydroleaceae	XII p. 398	Turpin Dicot. 50
Hydrophyllum virginiacum	*Hydrophyllum virginianum*	Hydrophyllaceae	XII p. 401	Turpin Dicot. 46
Hypericum perforatum		Hypericaceae	XII p. 411	Turpin Dicot. 158
Illecebrum verticillatum		Illecebraceae	XII p. 444	
Ipomoea jalapa		Ipomoea	XIII p. 17	
Sisyrinchium striatum		Iridaceae	XIII p. 26	Turpin Monocot. 63
Jasminum officinale		Jasminaceae	XIII p. 95	
Juglans regia		Juglandaceae	XIII p. 143	Turpin Dicot. 269
Juncus articulatus		Juncaceae	XIII p. 146	Turpin Monocot. 36
Triglochin palustre	*Triglochin palustris*	Juncaginaceae	XIII p. 146	
Krameria triandra		Krameriaceae	XIII p. 255	
Lacistema serrulatum		Lacistemaceae	XIII p. 266	Martius B. 1: 95
Salvia pratensis		Lamiaceae	XIII p. 283	
Laurus nobilis		Lauraceae	XIII p. 354	
Couroupita guianensis		Lecythidaceae	XIII p. 381	Turpin Dicot. 227, 229
Indifogera anil	*Indigofera suffruticosa*	Leguminosae	XIII p. 396	Turpin Dicot. 252
Cassia elongata	*Cassia angustifolia*	Leguminosae	XIII p. 397	
Mimosa pudica		Leguminosae	XIII p. 397	Turpin Dicot. 258 (part)
Tulipa sylvestris		Liliaceae	XIII p. 481	Turpin Monocot. 58
Pinguicula vulgaris		Lentibulaceae	XIIII p. 423	

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Linum usitatissimum		Linaceae	XIV p. 27	
Loasa grandiflora	*Nasa grandiflora*?	Loasaceae	XIV p. 76	Turpin Dicot. 213
Lythrum salicaria		Lythraceae	XIV p. 229	
Talauma pumila	*Magnolia pumila*	Magnoliaceae	XIV p. 291	
Malpighia macrophylla		Malpighiaceae	XIV p. 341	Turpin Dicot. 164 (part, rev)
Gossypium tricuspidatum	*Gossypium latifolium* var. *tricuspidatum*?	Malvaceae	XIV p. 351	Turpin Dicot. 136
Canna indica		Marantaceae	XIV p. 407	
Marcgravia umbellata	*Marcgravia umbellata*	Marcgraaviaceae	XIV p. 411	Turpin Dicot. 154 (part, rev)
Marchantia polymorpha		Marchantiaceae	XIV p. 411	
Melanorrhoea usitata		Melanorrhoea – 2 figures	XV p. 78	Wallich 1: 11–12
Rhexia speciosa	*Meriania speciosa*	Melastomaceae	XV p. 79	Turpin Dicot. 231
Veratrum sabadilla		Melanthaceae	XV p. 79	Turpin Monocot. 46 (part)
Trichilia spondioides		Meliaceae	XV p. 80	Turpin Dicot. 168–9
Mouriria guayanensis		Memecyclaceae	XV p. 88	
Menispermum canadense		Menispermaceae	XV p. 96	Turpin Dicot. 120
Mesembryanthemum albidum		Mesembryaceae	XV p. 124	Turpin Dicot. 196
Monimia rotundifolia		Monimiaceae	XV p. 331	Turpin Dicot. 290 (part)
Musa sapientum		Musa, Musaceae	XVI pp. 7, 8	Turpin Monocot. 66 (p. 7 only)
Myrica arguta		Myricaceae	XVI p. 38	Turpin Dicot. 298
Myristica aromatica	*Myristica fragrans*	Myristicaceae	XVI p. 39	Turpin Dicot. 14
Psidium pomiferum	*Psidium guavaja*	Myrtaceae	XVI p. 40	Turpin Dicot. 224
Zostera marina		Naiades	XVI p. 68	Turpin Monocot. 4 (part)
Nelumbium speciosum		Nelumbiaceae	XVI p. 141	
Nepenthis [sic = *Nepenthes*] *distillatoria*		Nepenthaceae	XVI p. 145	

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Nymphaea alba		Nymphaeacae	XVI p. 377	Turpin Dicot. 179
Oenanthe crocata		Oenanthe	XVI p. 403	
Olea europaea		Oleaceae	XVI p. 424	Turpin Dicot. 38 (part)
Jussiaea grandiflora	*Ludwigia grandiflora*	Onagraceae	XVI p. 437	Turpin Dicot. 218 (part)
Oncidium papilio		Oncidium	XVI p. 437	
Anoplanthus uniflorus	*Aphyllon uniflorum*	Orobanchaceae	XVII p. 36	
Oryza sativa		Oryza	XVII p. 46	
Oxalis violacea		Oxalidaceae	XVII p. 91	Turpin Dicot. 132
Paliurus aculeatus		Paliurus aculeatus	XVII p. 168	
Phoenix dactylifera		Palms	XVII p. 175	Chaumeton 3: 148 bis
Freycinetia imbricata		Pandanaceae	XVII p. 185	Blume R. 1: 40
Carica papaya		Papayaceae	XVII p. 207	Turpin Dicot. 212
Papaver somniferum		Papaveraceae	XVII p. 207	Turpin Dicot. 177
Passiflora horsfieldii		Passiflora	XVII p. 303	Blume R. 1: 52
Josephinia imperatricis		Pedaliaceae	XVII p. 365	Turpin Dicot. 54
Pekea tuberculosa	*Caryocar tomentosum*	Pekea	XVII p. 374	Aublet 239
Persea gratissima		Persea gratissima	XVII p. 464	Turpin Dicot. 13
Deutzia scabra		Philadelphaceae	XVIII p. 70	
Phytolacca decandra		Phytolacca	XVIII p. 138	Turpin Dicot. 20
Piper nigrum		Piperaceae	XVIII p. 177	Turpin Dicot. 291
Pistacia vera		Pistacia nut	XVIII p. 187	Turpin Dicot. 260
Pittosporum tomentosum	*Pittosporum revolutum*?	Pittosporaceae	XVIII p. 196	Turpin Dicot. 129
Plantago major		Plantaginaceae	XVIII p. 213	Turpin Dicot. 23
Plumbago capensis		Plumbaginaceae	XVIII p. 288	
Podophyllum peltatum		Podophylleae	XVIII p. 302	Turpin Dicot. 178

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Polemonium caeruleum		Polemoniaceae	XVIII p. 333	Turpin Dicot. 51
Claytonia virginica		Portulaceae	XVIII p. 442	Turpin Dicot. 195
Primula veris		Primulaceae	XIX p. 3	Turpin Dicot. 25
Quercus pedunculata	*Quercus robur*	Quercus	XIX p. 212	
Quercus mannifera	*Quercus robur*	Quercus	XIX p. 212	
Quercus sessiliflora	*Quercus robur*	Quercus	XIX p. 212	
Quercus brantii		Quercus	XIX p. 213	
Quercus rotundifolia	*Quercus ilex*	Quercus	XIX p. 213	
Quercus regia	*Quercus libani*	Quercus	XIX p. 213	
Quercus faginea	*Quercus lusitanica*	Quercus	XIX p. 213	
Quercus aegilops		Quercus	XIX p. 214	
Quercus rigida	*Quercus coccifera*	Quercus	XIX p. 215	
Quercus ballota	*Quercus ilex*	Quercus	XIX p. 215	
Quercus infectoria	*Quercus lusitanica*	Quercus	XIX p. 215	
Quercus chinensis	*Quercus bungeana*	Quercus	XIX p. 216	
Quercus castaneaefolia	*Quercus castaneifolia*	Quercus	XIX p. 216	
Restio tetraphyllus		Restiaceae	XIX p. 419	Turpin Monocot. 34–5
Rhamnus alaternus		Rhamnaceae	XIX p. 444	Turpin Dicot. 270
Spirea argentea	*Spiraea argentea*	Rosaceae	XX p. 161	Turpin Dicot. 238 (part)
Ruta graveolens		Rutaceae	XX p. 274	Turpin Dicot. 122
Salix caprea		Salicaceae	XX p. 353	Turpin Dicot. 296–7 (part, rev)
Samyda senulata [sic = *serrulata*]		Samydaceae	XX p. 383	Turpin Dicot. 245 (rev)
Santalum album		Santalaceae	XX p. 406	Turpin Dicot. 5 (part)
Achras sapota		Sapotaceae	XX p. 418	Turpin Dicot. 61 (rev)
Euphoria longana	*Dimocarpus longan*	Sapindaceae	XX p. 418	Turpin Dicot. 172 (part, rev)
Sarracenia purpurea		Sarraceniaceae	XX p. 444	Turpin Dicot. 181 (rev)

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Saururus cernuus		Saururaceae	XX p. 468	Turpin Dicot 295 (part)
Saxifraga granulata		Saxifragaceae	XX p. 487	
Rhinanthus hirsuta [sic = *hirsutus*]	*Rhinanthus minor*?	Scrophulariaceae	XXI p. 115	Turpin Dicot. 32 (rev)
Quassia amara		Simarubaceae	XXII p. 26	Turpin Dicot. 125 (rev)
Nicotiana crispa	*Nicotiana plumbaginifolia*?	Solanaceae	XXII p. 194	Turpin Dicot. 34 (part, rev)
Spondias mombin	*Spiraea mombin*	Spondiacae	XXII p. 370	Turpin Dicot. 263 (rev)
Marsilea fabri		Sporocarpium	XXII p. 378	
Stackhousia monogyna		Stackhousia	XXII p. 404	Turpin Dicot. 274 (rev)
Sterculia chicha	*Sterculia apetala*	Sterculiaceae	XXIII p. 41	Turpin Dicot. 142 (rev)
Stylidium laricifolium		Stylidiaceae	XXIII p. 178	Turpin Dicot. 82 (part, rev)
Styrax officinalis		Styraceae	XXIII p. 180	Turpin Dicot. 67 (rev)
Tamarix germanica	*Myricaria germanica*	Tamaricaceae	XXIV p. 23	Turpin Dicot. 234 (part, rev)
Thea bohea	*Camellia sinensis*	Ternströmiaceae	XXIV p. 235	Turpin Dicot. 153 (rev)
Daphne mezereum		Thymelaceae	XXIV p. 419	Turpin Dicot. 9
Tilia alba		Tiliaceae	XXIV p. 448	Turpin Dicot. 147 (rev)
Tetratheca glandulosa		Tremandraceae	XXV p. 182	Turpin Dicot. 175 (part)
Tropaeolum majus		Tropaeoleae	XXV p. 301	Turpin Dicot. 133
Turnera ulmifolia		Turneraceae	XXV p. 418	Turpin Dicot. 214
Typha angustifolia		Typhaceae	XXV p. 456	Turpin Monocot. 9 (rev)
Ulmus campestris		Ulmaceae	XXV p. 489	Turpin Dicot. 281 (rev)
Hydrocotyle spananthe	*Spananthe paniculata*?	Umbelliferae	XXV p. 498	Turpin Dicot. 111 (rev)
Boehmeria cordata [= *caudata*]		Urticaceae	XXVI p. 63	Turpin Dicot. 283 as *B. caudata* (rev)

Table 1. **Botanical illustrations in the *Penny Cyclopaedia* (cont.).**

Plant	Modern name if different	Article	Vol. & page	Source
Ficus carica		Urticaceae	XXVI p. 63	Turpin Dicot. 285 (rev)
Vaccinium myrtillus		Vaccinaceae	XXVI p. 74	Turpin Dicot. 69 (part)
Valeriana dioica		Valerianaceae	XXVI p. 93	Turpin Dicot. 97 (rev)
Vanilla aromatica	*Vanilla planifolia*	Vanillaceae	XXVI p. 117	Turpin Monocot. 76
Verbena mutabilis	*Stachytarpheta mutabilis*	Verbenaceae	XXVI p. 255	Turpin Dicot. 39 (rev)
Viola pedata		Violaceae	XXVI p. 345	Turpin Dicot. 188
Vitis vinifera		Vitaceae	XXVI p. 393	Turpin Dicot. 160 (rev)
Drimys chilensis	*Drimys winteri*	Winteraceae	XXVII p. 474	
Xanthoxylum pterota	*Zanthoxylum pterota*	Xanthoxylaceae	XXVII p. 617	
Xylomelum pyriforme		Zylomelum	XXVII p. 635	
Xyris operculata		Xyridaceae	XXVII p. 640	Turpin Monocot. 60 (rev)
Zingiber officinalis	*Zingiber officinale*	Zingiberaceae	XXVII p. 783	
Tribulus cistoides		Zygophyllaceae	XXVII p. 830	Turpin Dicot. 123 (rev)

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Aublet	J.B.C. Fusée Aublet, *Histoire des Plantes de la Guiane Française* (1775)
Blume J.	Carl Ludwig von Blume, *Flora Javae* (1828–51) – Lindley's copy is held in the Lindley Library
Blume R.	Carl Ludwig von Blume, *Rumphia* (1835–48) – Lindley's copy is held in the Lindley Library
Bot.Reg.	*Botanical Register*
Chaumeton	François Pierre Chaumeton, *Flore Médicale* (1814–20)
Comp. BM	*Companion to the Botanical Magazine* (1835–36)
Humboldt	Alexander von Humboldt [*et al.*], *Plantes Équinoctiales* (1808–09)
Martius Br.	Carl Friedrich Philipp von Martius, *Nova Genera et Species Plantarum quas in Itinere per Brasiliam* (1823–32)
Martius P.	Carl Friedrich Philipp von Martius, *Historia Naturalis Palmarum* (1831–50)
Palisot	A.M.F.J. Palisot de Beauvois, *Essai d'une Nouvelle Agrostographie* (1812) – Lindley's copy, in which the plates have been cut up and the individual figures pasted to face the relevant textual descriptions, is held in the Lindley Library
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Sibthorp	John Sibthorp, *Flora Graeca* (1806–40)
Smith	Sir James Edward Smith, *Exotic Botany* (1804–05) – Lindley's copy is held in the Lindley Library
Turpin	P.J.F. Turpin, *Dictionnaire des Sciences Naturelles: Botanique.* Planches (1816–29) – divided into Dicotylédones [Dicot.], Monocotylédones [Monocot.], and Acotylédones [Acot.]
Wallich	Nathaniel Wallich, *Plantae Asiaticae Rariores* (1829–32)

(part) = only a portion of the original illustration copied.
(rev) = shows right-to-left reversal from image copied.
* a botanical name for which the *Penny Cyclopaedia* is cited as the place of first publication.

Table 2. **Illustrations of cryptogamic plants in the *Penny Cyclopaedia*.**

Plant	Modern name if different	Article	Vol. & page
Aecidium berberidis		Aecidium	I p. 138
Agarics		Agaricus	I p. 195
Boletus igniarius	*Phellinus pomaceus*?	Amadou	I p. 410
Boletus luteus		Boletus	V p. 75
Chara sp.		Characeae	VI p. 488
Chenophora excelsa		Polypodiaceae	XVIII p. 374
Diatoma vulgaria /		Algae	I p. 323
Diatoma swartzii		Algae	I p. 323
Fissidens adiantoides	*Fissidens adianthoides*	Musci	XVI p. 10
Fucus vesiculosus		Algae	I p. 323
Hymenomycetous fungi, figs. 1–5		Fungi	XI p. 20
Pyrenomycetous fungi, figs. 6–12		Fungi	XI p. 20
Gasteromycetous fungi, figs. 13–20		Fungi	XI p. 20
Coniomycetous fungi, figs. 21–29		Fungi	XI p. 20
Gymnostomum ovatum		Musci	XVI p. 10
Jungermannia nemorosa		Jungermanniaceae	XIII p. 147
Oscillatoria distorta		Algae	I p. 323
Roccella sp.		Orchil	XVI p. 479
Ulva bullosa	*Monostroma bullosum*	Algae	I p. 323

Table 3. **Illustrations of fossil plants in the *Penny Cyclopaedia*.**

Plant	Article	Vol. & page	Lindley & Hutton, *Fossil Flora*
Asterophyllites foliosa	Coal plants	VII p. 294	I pl 25
Calamites dubius	Coal plants	VII p. 293	
Cyclopteris orbicularis	Coal plants	VII p. 293	
Lepidodendron sternbergii	Coal plants	VII p. 291	
Lepidostrobus variabilis	Coal plants	VII p. 291	I pl 10
Lonchopteris bricii	Coal plants	VII p. 291	
Neuropteris gigantea	Coal plants	VII p. 292	
Odontopteris brardii	Coal plants	VII p. 292	
Otopteris sp.	Otopteris	XVII p. 62	II pl. 128, 132, 150, 155 (rev)
Pecopteris lonchitica	Coal plants	VII p. 292	II pl 153 loosely
Sphenophyllum schlotheimii	Coal plants	VII p. 294	
Sphenopteris artemisiaefolia	Coal plants	VII p. 292	
Sigillaria reniformis	Coal plants	VII p. 294	I pl 57 (rev), loosely
Stigmaria ficoides	Coal plants	VII p. 293	
Trigonocarpum nöggerathi	Coal plants	VII p. 291	

NB. No attempt has been made to provide current equivalents for these names.

Table 4. **Famous trees in the *Penny Cyclopaedia*.**

Plant	Article	Vol. & page
Alnus: old alder tree	Alnus	I p. 369
Quercus. The Wallace oak	Age of trees	I p. 203
Taxus. The Ankerwyke yew	Age of trees	I p. 203

Table 5. **Other botanical illustrations in the *Penny Cyclopaedia*.**

Subject	Article	Vol. & page
Acanthaceae	Acanthaceae	I p. 66
Adhesions	Adhesions	I p. 119
Amygdaleae: floral organs	Amygdaleae	I p. 478
Compositae: flowers and floral lips	Compositae	VII p. 422
Compositae: stigmas &c	Compositae	VII p. 422
Convolvulaceae: anatomical details	Convolvulaceae	VII p. 489
Cotyledons	Cotyledon	VIII p. 103
Cruciferae embryos	Cruciferae	VIII p. 184
Endogenous stem cross-section	Endogens	IX p. 396
Endogenous vegetation	Endogens	IX p. 397
Exogenous vegetation	Exogens	X p. 124
Exogens: star diagram for classification	Exogens	X p. 130
Exogens: stem and root cross-sections	Exogens	X p. 120
Exogens: stem and root cross-sections	Exogens	X p. 120
Exogens: stem cross-section	Exogens	X p. 121
Exogens: stem cross-section	Exogens	X p. 121
Exogens: stem cross-section	Exogens	X p. 121
Exogens: stem cross-sections	Exogens	X p. 122
Exogens: stem cross-sections	Exogens	X p. 122
Exogens: stem cross-sections	Exogens	X p. 123
Exogens: stem cross-sections	Exogens	X p. 123
Fern stem (*Alsophila vestita*)	Polypodiaceae	XVIII p. 373
Fern stem (*Chnoophora excelsa*)	Polypodiaceae	XVIII p. 373
Fern stem cross-section (*Alsophila vestita*)	Polypodiaceae	XVIII p. 373
Fern stem tissue (*Cyathea schanschin*)	Polypodiaceae	XVIII p. 373
Germination patterns	Germination	XI p. 199
Glands (7 figures)	Gland	XI p. 250
Greenhouse: section	Greenhouse	XI p. 437
Hairs: 5 figures	Hairs	XII p. 10
Inflorescence diagram	Inflorescence	XII p. 473
Leaf bud diagrams	Leaf-bud	XIII p. 375
Lichens in fructification	Lichens	XIII p. 463
Orchid anthers (7 genera)	Orchidaceae	XVI p. 478
Orchid flowers (10 genera)	Orchidaceae	XVI p. 476

Botany

John Lindley
Entry from the Penny Cyclopaedia

BOTANY is that branch of science which comprehends all that relates to the vegetable kingdom. The term Botany is derived from the Greek, in which *bótane* (*βοτάνη*) signifies any kind of grass or herb, and *bótanike* (*βοτανική*) the art which teaches the nature of plants and herbs. The structure of plants, their mode of growth, their habits of life, their mutual relations, their uses to man, or the danger that results from their employment, the station they occupy in the scale of the creation, and many other similar considerations, form each an extensive field of inquiry which botany combines into one connected whole. This statement will serve to show how imperfect a view of the subject is taken by those who imagine that the art of naming and classifying plants is the great end of the science, and not one of the most humble of its means, unless it is conducted upon great general views and sound philosophical principles.

In an article of this kind it would be impossible to enter very minutely into any of these subjects, or indeed at all into many of them; we shall therefore confine ourselves to, 1. *A general view of the nature of plants:* 2. *The history of the steps by which botany has advanced from its rudest state to its present condition as a science:* and 3. *The practical purposes to which it is capable of being applied;* to which will be appended a *glossary* of the botanical terms most frequently in use.

I. To our ordinary apprehension a plant is an organized body, attached to the surface of the earth by roots, which at once keep it stationary and feed it; incapable of motion except from the agency of external influences, destitute of perceptibility, living by aid of its leaves, and multiplying by the power of its flowers, fruit, and seeds.

To enable it to execute the functions of nutrition, its leaves possess the property of decomposing and assimilating the fluid or gaseous matters which are obtained by the roots from the soil and conveyed into the leaves through the stem: these parts are also capable of returning the elaborated matter back into the stem, or to those organs in which its presence is most required. To bring about the phenomena of reproduction, the leaves are modified in form and nature, and become successively a calyx, which protects the interior of the flower, and a corolla which gives it beauty;

stamens, whose points are filled with a fertilizing powder, and a pistil which is furnished with the means of imbibing the fertilizing influence and conveying it to the young seeds enclosed within its cavity. The latter are fed by the nutritive matter elaborated by the genuine leaves until they are full grown; they are in the mean while guarded from external injury by the fruit which grows with their growth, and at last contain a miniature representation of their parent enveloped in many folds of tough protecting matter, and capable of reproducing a being exactly like that by which it was itself produced, whenever it is committed to the soil from which it is in turn to obtain its food.

In a more general point of view, a plant is to be considered as a mass of closed, transparent, elastic, irritable bags, called tissue, formed of an excessively delicate membrane, and combined into various organs, by means of which the functions of its life are carried on. This tissue occurs in several different forms, all of which are reducible to the cellular, the fibrous, and the vascular. Of these, the most important is the cellular.[1] This kind of tissue consists of little bladders or vesicles, which, if developed in a medium in which they experience no resistance, would be of a spheroidal nature, but which lose that form by being exposed to various degrees of compression, in consequence of which they are found in a state varying from the form of a rhomboidal dodecaedron to that of extremely elongated parallelograms. Such tissue as this constitutes the basis of all vegetables, generally by far the largest part of them, and often their entire structure. The two other forms are of secondary importance, are generated subsequently, and are probably mere modifications of it. It appears to be indispensable to the propagation of species, forming the fertilizing matter in flowering plants, and being that by means of which the species of flowerless plants are exclusively propagated.

[1] [The next great revolution in botany was in the making even as Lindley wrote these words, with the work of Matthias Schleiden and Theodor Schwann, who independently of each other proposed the cell theory (that cells are the basic units of life, and that all cells arise from previous cells). Lindley would acquire several of Schleiden's works, including the 1845–46 edition of his *Grundzüge der wissenschaftlichen Botanik*, and also Schwann's *Mikroskopische Untersuchungen* (1839); his copies are today in the Lindley Library.

In medicine and zoology, it is well known that the cell theory was preceded by the tissue theory of Bichat. Less well known is that early nineteenth-century botany saw the temporary ascendancy of a comparable tissue theory, associated mainly with Mirbel, Link, and Treviranus, some of whose works Lindley owned. BE.]

Fibrous tissue consists of tubes of variable length packed closely side by side.

Vascular tissue has the appearance of transparent threads twisted spirally like a bell-wire within a membrane, and either readily unrolling in consequence of the want of cohesion of the contiguous spires and then contracting when the force that was required to unroll them is removed, or not capable of unrolling, in consequence of the cohesion of the spires, and assuming the appearance of a tube streaked crosswise with fine lines; or else, in consequence of an interruption of the continuity of the cohering spires, that of a cylinder covered with broken bars or interrupted fissures.

It may possibly be supposed that these elementary organs are readily recognized upon a mere casual inspection, that they bear some considerable proportion in size to the plants themselves to which they belong, and that nothing more is necessary than to pull a portion of any vegetable matter in pieces to discover those bladders, fibres, and spirally twisted vessels. So far however is this from being the case, that an observer would certainly recognize nothing of what has been mentioned, by inspection with the naked eye, except perhaps in the pith of a few plants, such as the elder for instance, in which it is possible to distinguish the cells of cellular tissue. The fact is, that countless multitudes of individual cells, or vessels, or fibres, are required to form but a very small portion of vegetable matter. So exceedingly minute are they, that it has been calculated that above 10,000,000 vesicles of cellular tissue are contained in a fungus called Reticularia maxima, three or four inches broad, and something less than half an inch thick. A single thread of hemp, which is not thicker than a human hair, is composed of a considerable number of tubes of woody tissue glued together; and the stalk of a strawberry leaf conceals hundreds of spiral vessels in its centre. From such materials, thus infinitely minute, and as we must suppose infinitely weak in each individual case, though of surprising strength and force in a state of aggregation, is the whole vegetable world constituted, and by their agency are all the delicate actions of vegetable life maintained in a state of ceaseless activity.

For the adequate performance of such functions tissue has certain special powers; the most remarkable of which are *cohesion* and *permeability* to fluid or gaseous matter. It would be difficult to conceive how vesicles, or fibrous or spiral threads, could be combined into bodies of regular and uniform figure, unless the property of mutual cohesion were to exist. We

know in fact that this power is universal in the vegetable kingdom, and that all contiguous surfaces in plants either uniformly do, or frequently will cohere, and so firmly that no traces of the union can subsequently be discovered. Thus, cellule adheres to cellule; a dodecaedron has another cellule firmly united to each of its twelve plane faces, a parallelogram is surrounded by six, and so on; and cylinders cohere side by side where their surfaces touch each other. In like manner as cellule grows to cellule and fibre to fibre, so do contiguous masses of such tissue form a vital union; leaves will grow to leaves, and stems to stems, approximated bracts cohere into involucres, the margins of petals grow together and form monopetalous corollas; nay, even the stamens and pistils contract adhesions of various kinds, not only with their own parts, but with one another, thus arriving at a most complete state of hermaphroditism; and finally, one plant may be made so to grow to another, that in a short time no traces of the union are left, and to our senses a complete amalgamation of their respective individuality is effected. Allusion is not here made to the natural union of one species with another which takes place between parasites, properly so called, and the tree that bears them; but rather to the artificial combinations which man as from very distant ages had the power of making for his profit of his pleasure. Thus we take a branch of one plant and apply its tissue to that of another even of a different species; a strict adhesion speedily takes place, and a new individual is the result, consisting of the two species firmly united to each other, each possessing its own particular system, exercising its own peculiar functions, and only to be separate in death. Upon this property depend the gardening operations of grafting, budding, inarching, and so forth.

In the next place, tissue has the power of transmitting fluids in all directions through its membrane. This membrane has been already described as transparent, nearly as much so as glass or talc; it is also perfectly continuous, without the slightest trace of perforation or pore. It has been supposed, indeed, to be furnished with pores visible under the microscope, but all observers are now agreed that this is not the fact. It is however undoubtedly permeable, not only to gases or the more subtile fluids, but also to water and substances held in solution by it, which pass through the membrane with the greatest facility. Hence, notwithstanding the want of distinct orifices by which nutrition can be received by plants, and superfluous matter expelled, the processes of

absorption and perspiration are as constantly and regularly in action as in the animal world. How perfect must be that permeability, and how efficient the means of the transmission of the fluids, by which plants are nourished, may be easily collected from this fact, that the tiny leaves of the gigantic pine-trees of Northwest America must some of them be fed from a distance of 250 feet, through all the sinuosities and obstructions of tortuous branches, and still more tortuous roots: in such a case of as this the nourishing system of a single leaf would be at least 5000 times greater than the leaf itself.

We are accustomed to regard a plant as an individual consisting of a central part, called a root and stem, round which various organs known by the name of scales, leaves, bracts, flowers, and finally fruit, are arranged in a certain order; and to consider an individual plant as of a nature analogous to that of an individual animal, having a term of time within which the duration of its life is fixed. Thus there are plants that are born and die in a day, such as the race of mucors; and there are animals whose existence is perhaps not much longer, such as infusoria; other plants are animated for a few months, increase their species, and die, like many insects – while the remainder of the vegetable world having, like the higher orders of animals, no fixed limits of existence, perish only by accident or disease. Undoubtedly, in one sense, a plant is to be considered as an individual, but not in the sense to which we have adverted. In an individual animal the loss of any limb is *pro tanto* destructive of its functions: the removal of a leg for instance renders it less capable of walking, of an eye of seeing, of a hand of holding, and so on, while the removal of some organs, as the head or the heart, is instantly destructive of life altogether, and the individual perishes. And again, the individual animal has but one apparatus for propagating its species, which, once removed or injured, can never be replaced. Not so plants. From an individual plant limb after limb may be lopped away without detriment; its head, its roots, may be mutilated, or even removed, and yet its vitality *remains unimpaired;* its very heart (*i.e.* heart-wood) may be scooped out or rot away by disease, and yet its life and all its functions go on as before. If deprived of the power of procreation in one part, an hundred other sets of apparatus are ready to supply the deficiency. If plants were to perish as readily as animals, the world would soon be a barren waste, – so exposed are they to accidents, and so constantly destroyed for the purposes of man: rooted to the soil, without the power of evasion, or of defence, injuries such as

are fatal to animals are of constant occurrence with them. Their organs of reproduction are either in the form of flowers or of fruit, the most attractive or most useful parts that they possess, and are continually torn from them to administer to the pleasures or necessities of animals. Undoubtedly such an explanation of the cause of the difference between animals and plants is both pleasing and true. But the philosopher cannot pause thus at the threshold of his inquiry; he must also seek to explain the exact nature of the difference between animals and vegetable vitality, and to discover how it happens that the individuality of the two kingdoms is so essentially different.

The first person who ventured fairly to approach this subject was Dr. Darwin,[1] who about forty years ago published his opinion, that plants were a lower order of animals analogous to corals, and endeavoured to prove the truth of his theory, by demonstrating a direct analogy between plants and animals in every organ of nutrition or reproduction. His views have been little attended to in this country, which may be easily accounted for by the facts on which he relied being so much mixed up with fanciful and inaccurate matter, that discredit was cast upon his whole theory. And yet it cannot now be doubted that the analogy that he laboured to demonstrate between plants and animals is every day becoming more and more certain, even to the point of a distinct circulation of blood in the vegetable kingdom; but that what we are justified in calling the most original and important part of his theory was strictly true, we shall proceed to explain.

If we look a little closely into the structure of a tree, we shall find that it is composed throughout of tissue arranged in the same order, exactly, in every part: for instance, if at the bottom of the stem there is cellular tissue in the centre, and fibrous and vascular tissue arranged in a particular manner round it, exactly the same tissue arranged in the very same manner will exist in every division of the stem. So that except in diameter there is no essential difference between the trunk of an oak, for example, and its most slender twig. Again, with regard to the manner in which the stem, or the branches, or the twigs are surrounded with leaves, and flowers, and fruit, it will be found upon accurate observation, that whatever may be their disposition, or proportion, or nature in the first shoot

[1] [Erasmus Darwin: he propounded his idea that "Vegetables are inferior animals" in the first chapter of his *Phytologia* (1800), pp. 1–9. BE.]

that a germinating seed shall have made, the same will be the disposition, proportion, and nature of the shoots in all succeeding branches, so that if a tree consists of a million twigs, it will consist of a certain arrangement of external and internal organs, a million times uniformly repeated. It will be further remarked that the original twig, produced upon germination, sprang from a vital point, or bud, never varying in position, that existed in the seed; that the second race of twigs or shoots was generated from new vital points or buds formed in the first shoot, and inevitably in the same position as the first or seminal vital point bore to the seed leaves; that the third generation originated from the second exactly as the second from the first, and so on. A fourth observation would to an attentive observer be connected with these. It would be seen that as the development of the seed took place in two opposite directions, the one upward, the other downward, so in like manner did the buds develop; that while the seed sent a stem upwards to bear leaves and to generate vital points, and a root downwards, to support them, so does each bud send upwards leaves and other buds, and downwards roots; the latter however creeping under the bark, while those of the seed creep beneath the soil.

Such observations as these cannot fail to lead to this conclusion, that the cause of plants bearing the most extensive mutilations with impunity, in which they so especially differ from animals, is, that they are not simple, but compound individuals, with as many distinct seats of vitality as they contain buds; and that consequently when branches are lopped off, or flowers and fruit gathered, we only separate from a large mass of individuals a small portion of the community, the absence of which is no more missed by, or productive of no greater inconvenience to those that remain, than the swarming of bees is to their parent hive.

It is obvious therefore that they in reality bear a close analogy to corals and polypes; and this leads us to the inquiry as to how plants differ from the animal kingdom.

If animals consisted only of quadrupeds, and birds, and fishes, and vegetables were confined to trees and herbs, no conceivable difficulty of assigning to each kingdom the most positive limits could be experienced. For every person sees how wide a difference exists between the larger animals and the more conspicuous plants: the less indeed we are acquainted with the subject, the more easy is the task of distinguishing them; but to those who are acquainted with the infinite varieties of form, structure, and nature, which are included within these kingdoms, the

limits which divide them will be found to present one of the most difficult problems in the philosophy of natural history.

As an ingenious French physiologist has well remarked, it is not a question about what are the characters peculiar to animals, but what are common to them all. We know very well that they only have brain, nerves, muscles, a heart, lungs, a stomach, and a skeleton; that they move, digest, respire; that they have blood, and appear to have sensation; but what remains of all these characters when we descend the long chain that they form, from the first link to the last. Almost nothing. Lungs, glands, brain, skeleton, heart, arteries, blood, nerves, and muscles, successively disappear, till at last we are not sure whether we have even a stomach left. (*Isid. Bourdon, Phys. compar.* p. 10.)

If a comparison is instituted between the highest form of development in either kingdom, between a human being and a tree, the differences are too striking to escape the most ordinary observation. We see that animals are endued with sensation and perception; that they possess locomotivity, or the power of transporting themselves from place to place; that they live upon organic substances which their powers of locomotion and perception enable them to select; that their food passes through an alimentary cavity, from which its nutritive properties are transfused by means of absorbent vessels into the system. Plants, on the contrary, are destitute of all traces of a nervous system and consequently of perception; they are fixed to a particular spot whence nothing but mechanical power can remove them; they are incapable of all motion, except from some internal mechanical agency; they subsist upon such inorganic matter as surrounds them, and their food is at once introduced into their system by absorption through their external surface only.

Vegetables are also said to be compound beings, animals simple beings. For illustration, whatever objections may be taken to such a comparison, the latter may be considered, with Link and Blumenbach, to have only one seat of life, the sensorium commune, and to have but one provision made by nature for their propagation; the former, which are capable of reproduction by various means from various points of their body, must have the seats of vitality as numerous as the parts which are thus capable of self-perpetuation. Hence articulations, buds either latent or developed, and seeds, are in plants so many distinct seats of vegetable life. While all-powerful man has but one feeble means granted him of perpetuating his race, millions of millions of individuals, which in a physiological sense

are identically the same, have been produced by the half-dozen potatoes brought to Europe by Raleigh, in 1584, and this without any aid from the ordinary means which nature has given plants for their multiplication.

Among the distinctions between the animal and vegetable kingdom, that which demands the first consideration is the different means possessed by animals and vegetables of procuring food and of imbibing nourishment. Animals have the power of moving from place to place, and are gifted with perception, which enables them to distinguish what is proper for their sustenance. They are also furnished with organs of mastication, which enable them to reduce to minute pieces very hard substances. As their food is only procured by an act of exertion on the part of the animal, and as this exertion is not continual and uninterrupted, but only takes place at intervals of time, they are also provided with an internal reservoir in which the food that is so procured is deposited; from this reservoir, called the stomach, the absorbent vessels conduct the elaborable parts into the system, while the solid useless parts are rejected: animals therefore are nourished by internal absorption. Vegetables which are continually rooted to the same spot, which have no power of roaming from place to place in search of aliment, which have no capability of distinguishing between the useful and the hurtful, the wholesome and the poisonous, but which are compelled to derive their support from such matter as chance may place immediately and continually in contact with them, and which therefore experience no cessation to the supply of food, are not provided by nature with organs of mastication. The want of these organs renders a stomach unnecessary; internal absorption or intussusception of nutriment cannot take place; and we accordingly find that their existence is sustained not by an uncertain periodical introduction of food into an internal cavity, but by the perpetual absorption of food from the matter perpetually about them, through pores of their surface too fine for human perception. Nothing therefore which requires to be divided by mechanical force, nothing which needs to be altered in its texture or substance before it can be used, or to *be digested,* nothing which has to be sought for, nothing in short but matter which is so delicate as to pass through perforations, which the human senses, aided by the most powerful microscopes cannot distinguish, is fitted for the support of plants; and no inorganic matter exists which answers to this description, but water or air, or substances held in solution by these two elements, and such in fact are the materials by which vegetables are supported.

As in animals, nourishment is derived from their centre, so it follows that all their absorbent vessels have a direction towards that centre; and for the same reason, as in plants, nutrition is communicated from the outside, so is it in that direction that all the absorbent vessels of the vegetable are directed. The consequences of these two laws is, that while a term is prescribed to the growth of the most perfect animals, no limit seems to be fixed for that of the most perfect vegetables. The former perish as soon as their original vessels become incapable of performing their functions; the latter endure until the power of forming new vessels shall cease. The period to the former is fixed, to the latter unlimited. Hence an eloquent French writer has ingeniously said, that animals die of old age or accidents, vegetables of accidents alone. Hence also the incredible age to which certain trees arrive. The cedars of Mount Lebanon are said to be of an antiquity far beyond all history; and it has been calculated by a French botanist, from actual inspection, that the age of the baobab trees of Senegal must have exceeded 6000 years. These are the most decided differences between animal and vegetable life, and are almost without exception. Some plants, indeed, having only an annual or biennial existence, have a term fixed to their lives, just as animals have, but no plants can be pointed out in which nourishment does not take place from the outside. When we descend in the scale of being, when we arrive at those limits of the world where life first arises out of death, in which sensation is indistinguishable, and from which the two kingdoms seem to diverge as from a common point, even there we find the polypes, which are so simple in their structure that they may be turned inside out like a glove, always conforming to this law. Zoologists assure us that they still absorb from the inside even when that part of the body which was once the outside has to perform the duties of a stomach.

But with this exception we know of no absolute external distinction which has yet been discovered between animals and vegetables. The ingenious idea of Mirbel, that animals live upon organic, vegetables upon inorganic matter, must, as respects the infusorial animalculae, be a purely hypothetical difference, and in more perfect animals is not true, as has been shown by Mr. William MacLeay, who asserts that 'many animals of the lower tribes, and some Heteromerous Coleoptera, have been observed to feed upon inorganic matter.' (*Horæ Entomologicæ*, ii. 193.)

If we now reconsider the observations which have just been made, and endeavour to see to what the distinction of animals and vegetables is

really reducible, we shall find that it consists in animals being organic beings, possessed of sensation and locomotion, and sustained by the absorption of nutriment through an internal canal, while plants have no sensation or locomotion, and are nourished by absorption through their cuticle. But how are we to apply these distinctions to the lower orders of created beings? Among these we find productions, which it is impossible, by the characters now assigned, to refer with any exactness either to the one kingdom or the other. A drop of water and a little brown or green slime from a ditch will often afford abundant evidence of the accuracy of this remark.

If we place a drop of water and a few fragments of confervæ[1] under a microscope, we shall probably discover an abundance of little bodies shaped like a weaver's shuttle, transparent at the extremities and in the middle, with two or four semi-opaque brownish cavities in their inside: these bodies have a sort of starting motion, very distinct and continued, but they do not seem capable of turning on either axis; nor is any motion of contraction visible; they vary in length, according to De Blainville (*Dict. des Sc. Nat*. 34, 367), from the five-hundredth to the hundredth of a line, and when full grown exceed these dimensions considerably. By Müller, a standard writer upon infusorial animalcules, they are considered animals, and referred to his genus Vibrio[2], part of which consists of bodies of an undoubted animal nature. By modern observers they have been named Navicula. When young they are attached to confervæ by a stalk so delicate as to be almost invisible with the aid of the most perfect microscopes, and during this period they have, according to M. Bory de St. Vincent, no visible motion whatever; but when the Navicula is fully formed it separates from the plant on which it grew, swimming and starting about in the water in the way described. Are such productions animal or vegetable? When young they are motionless

[1] [Confervae – I have not attempted to trace Lindley's sources for these interesting borderline phenomena, but as the names he used are now unfamiliar, here are some loose identifications.

The 21 species of *Conferva* as described by Linnaeus in *Species Plantarum* have now been redistributed among the algal genera *Batrachospermum, Cladophora, Griffithsia, Lemanea, Pylaiella, Polysiphonia, Stypocaulon, Vaucheria*, and *Vesicularia*; there is an interesting history of their taxonomy (Silva 1979). BE.]

[2] [*Vibrio* was a name coined in 1773 by Otto Friedrich Müller for what is now classed as a protozoan, *Pseudomonilicaryon anser*. (Nothing to do with the current meaning of *Vibrio*, as a genus of bacteria.) BE.]

and vegetable like a minute plant; when full grown they acquire the movement of animals. Perhaps one may say they are the latter, and compare their vegetating state when young to that of the Polype, called Vorticella, an undoubted animal, if rapid and varied motion can make it so.

Among confervæ in ditches are often found little fragments of organized bodies; some like ribbands, separable completely into numberless narrow transverse portions, others dividing partially at their articulations, but adhering at their angles like chains of square transparent cases. These enter the genera called by naturalists Diatoma, Fragilaria, Exilaria, Achnanthes. Are they animals or plants? When combined they are motionless, with all the appearance of confervæ, their transparent joints filled with the green reproductive matter of such plants; but when they disarticulate, their separate portions have a distinct sliding or starting motion. Shall we call them, with M. Gaillon, chains of animals assembled in a voluntary captivity which no one has seen them assume; or shall we not be rather justified in viewing them as links between the animal and vegetable kingdoms, and endowed with the characters of both.

Conferva mutabilis, or Draparnaldia[1], is a plant-like body, which, according to Messrs. Mertens and Gaillon, is sometimes an animal, sometimes a plant. The former says that he has frequently seen it undergo its transformation, particularly in August, 1822. On the 3rd of that month he showed it to a great number of persons in a state of plant; on the 5th it had disarticulated into portions distinctly moving in water, which on the 6th began again to unite, and on the 10th became finally combined into their primitive state of conferva. (*Dict. des Sc. Nat*., 34, 373.)

It perhaps may be said that the instances yet given are not at variance with the distinction of animals and vegetables by their power of motion; and that as they are all inert when in their most perfect state, their giving birth to moving bodies does not make them animals any more than the production of motionless eggs by birds, reptiles, and mollusca makes them vegetables.

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[1] [*Conferva mutabilis, or Draparnaldia* – difficult to assess this passage. The organism which Roth named *Conferva mutabilis* in 1797, and which is now *Draparnaldia mutabilis*, is capable of great extensions of its hairs, but one would not think this could lead anyone to call it an animal. The sort of transformation described suggests a slime mould; but it is generally agreed that it was not until 1869 that Oskar Brefeld first identified a cellular slime mould. BE.]

In which kingdom then are we to station the curious Polyphysa[1], a most undoubted polyp, according to Lamouroux, Leman, and De Blainville; an equally certain plant if we are to believe Turner, Agardh, and Gaudichaud, the last of whom found it living, and describes it thus. It grows in thick tufts to the shells which are thrown shore upon the barren coast of Shark's Bay in New Holland. Each individual consists of a fistular, capillary, greenish stalk, about an inch or an inch and a half long, expanding at the base into a sort of root-like claw, by which it is fixed. At the end it bears from fifteen to eighteen sacs, which are entire, rounded at the end, and slightly attenuated to the base; each contains a multitude of little round green globules, which finally expand and break through the thin case in which they are included. They are filled with a green unctuous matter, and the colour of the parent body is entirely due to their presence, for when they have all escaped from their sacs, the mother body is perfectly colourless.

To which kingdom are we to refer the beautiful Salmacis[2] and all the tribe by some botanists called Confervæ conjugata, of Zygnemas[3], which Messrs. Gaillon and Dr Blainville assert to be of animal nature, but which grow like vegetables, from which they are undistinguishable by external characters. They are transparent tubes, having distinct articulations and transverse partitions, the cavity being filled with brilliant green spherules arranged with the most beautiful symmetry in one or more spires, which separating at a certain period of their existence, and passing through the sides of the tube, develop in the form of new tubes exactly like their parent. When in a perfect state the contiguous tubes or filaments unite in a matter completely animal in appearance, uniting at one period, separating at another, and finally combining themselves into a single and uniform being.

Lastly, where are we to place the oscillating confervæ, those slime-like masses which cover the earth in damp and shady places, or form mucous patches among the confervæ and polypes of stagnant water, or appear under the form of a rich carmine stain, bordered with resplendent violet and blue, on the surface of hot springs, in all parts of the world; productions

[1] [*Polyphysa,* a name coined by Lamarck in 1816, has now been absorbed into the algal genus *Acetabularia*. BE.]

[2] [*Salmacis,* a name coined by Bory, was early on absorbed into the algal genus *Spirogyra*. BE.]

[3] [Agardh's genus *Zygnema* is still valid. BE.]

which, according to the speculations of an ingenious Swedish naturalist, have once possessed an animal life, of which they now retain only the appearance. These oscillatorias[1] consist of articulated tubes filled with green granules, and grow and increase like confervæ, and the reproductive particles to which they give birth have no motion that is apparent. But the tubes themselves have a writhing, twisting, undulating, creeping, distinctly animal motion, which it is impossible to mistake; they are more active in warm than in cold weather, and in the latter can be excited to action by the application of warmth. When chemically examined, they have been found to exhibit many of the characters peculiar to the animal kingdom; and when burnt, yield a carbon of the most fetid odour, exactly resembling that of decaying animal substances.

Such are a few of the difficulties which that naturalist has to overcome who would fix the limits between the animal and vegetable kingdoms. It is clear that the power of voluntary motion exists in beings having a distinctly vegetable structure, both in the most perfect state and in a state of disintegration; that the absorption of nutriment from the inside in the one family, and from the outside in the other, is a character not appreciable in such creatures as the monads, and the vivifying animalcules of flowering plants; and, finally, that chemical differences are destroyed by anabaena[2] and oscillatorias. In this difficulty shall we admit, with M. Bory de St. Vincent, a new kingdom intermediate between plants and animals, characterized as consisting of insensible individuals, that develop and increase in the manner of vegetables, up to the period when they separate into animated germs or reproductive fragments; or shall not we rather consider the absence of all exact limits between animal and vegetable nature as a striking proof of the beautiful harmony of nature, and of that unity of purpose which is so visible in all the works of the Creator; as an evidence that all the forms of life are but assemblages in insensible gradation of the same living matter differently combined by the great Spirit that pervades all matter and all space?

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[1] [*Oscillatoria*, a genus named by Vaucher in 1803, is now included in Cyanobacteria, but the species with which Lindley was probably most familiar – *O. alata*, published in Greville's *Scottish Cryptogamic Flora* in the 1820s – is now *Petalonema alatum*. BE.]

[2] [*Anabaena*, a genus named by Bory de St Vincent, is now included in Cyanobacteria. BE.]

II. In treating of the history of this science, we have no intention of entering upon details which can only interest the systematical botanist, or of criticising every step which its followers may have taken; but, on the contrary, we shall confine ourselves to a mere sketch of the progress that has been made in elucidating the great principles by which its rank as a branch of philosophy is to be determined.

It is obvious from various passages in the most antient writers, that the art of distinguishing certain plants having medical virtues was taught at the earliest period of which we have any written record; and that the cultivation of something more than corn was already understood in the Homeric days is sufficiently attested by the references to the vineyards of Laërtes and the gardens of Alcinous, and by the employment assigned to Lycaon, the son of Priam, of pruning figs in his father's garden.

The earliest tangible evidence that we possess of the real state of knowledge upon this subject is afforded by the remains of the writings of Aristotle and his school. From the absurd superstitions of the root-cutters (*rhizotomi*) of this period it might be imagined that at this time botany was far from having any real existence; for it is to them that we have to trace the belief in the necessity of magical ceremonies and personal purification in collecting herbs; some sorts, they tell us, are to be cut against the wind, others after the body of the rhizotomist has been well oiled, some at night, some by day. Alliaceous food was a necessary preparation for procuring this herb, a draught of wine for that, and so on. But in fact at this very time the Peripatetic philosophers were in possession of a considerable mass of correct information concerning the nature of vegetable life, mixed up indeed with much that was fanciful and hypothetical, but calculated to give us a high opinion of their acuteness and of the amount of positive knowledge upon such subjects which had by that time been collected. It is by this school that botany must be considered to have been first formed into a science. Aristotle, in all probability, was its founder; for it is obvious from the remarks upon plants scattered through his books concerning animals, that his knowledge of vegetable physiology was, for his day, of a most remarkable kind. But as the books immediately concerning plants ascribed to this philosopher are undoubted forgeries, it will be more convenient to take the works of Theophrastus as our principal guide to a determination of the state of botany at the commencement of this –

The First Æra. – At the time when Theophrastus succeeded to the chair of Aristotle (B.C. 324) no idea seems to have existed of classification, nor

indeed was its necessity by any means apparent, for Theophrastus does not appear to have been acquainted with above 355 plants in all. In the application of their names, even to these, there was so much uncertainty that the labours of commentators must be to a great extent bestowed in vain in endeavouring to elucidate them: for instance, Sprengel asserts that the name Aphake is applied indifferently to the dandelion and to a kind of vetch (*Lathyrus aphaca*), and Scorpios to a species of broom, to *Arnica scorpioides*, and to a kind of ranunculus. But while Theophrastus was thus careless in his denominations of species, he has the great credit of having attended accurately to differences in the organs of plants, to some of which he gave new and special names; the form of leaves, their margin, the manner of their indentation, and the nature of the leafstalk, especially attracted his attention. He distinguished naked-seeded from capsular plants, and he demonstrated the absence of all philosophical distinction between trees, shrubs, and herbs, for he saw that myrtle-trees would degenerate into shrubs, and certain oleraceous plants become arborescent. Cellular tissue is spoken of as a sort of flesh interposed between the woody tissue or vegetable fibre; and even spiral vessels appear to be indicated under the name of *ines* (ἶνες): leaves are correctly said to have their veins composed of both woody tissue and spiral veins, and the parallelism of the veins of grasses is particularly pointed out; palm-wood is shown to be extremely different from that of trees with concentric layers; bark is correctly divided into liber and cortical integument, and the loss of the former is said to be usually destructive of life. The nutritive properties of leaves are clearly pointed out, and the power which both surfaces possess of absorbing atmospheric nourishment. Some notion appears to have existed of the sex of plants, contrary to the opinion of Aristotle, who denied them to the vegetable kingdom; in particular Theophrastus speaks of the necessity of bringing the male dates into contact with the females, a fact which had been stated quite as clearly by Herodotus (i. 193) 100 years before; but it is plain that he had no correct idea upon this subject, for in another place he compares the male catkins of the hazel to the galls of the Kermes oak.

These points are abundantly sufficient to show that among the Peripetatics a considerable amount of tolerably exact knowledge of botany really existed, and that a solid foundation had been laid for their successors.

And in fact it appears that the impulse they gave to investigation did for some considerable time afterwards produce a perceptible effect; for by

the time of Pliny it is evident that a considerable addition had been made to the stock of botanical knowledge. It is true that it was much disfigured by the poets, who then, as now, appear to have had only a smattering of the science of their day; but it is incredible that they should have been able to glean that smattering out of any other field than a very rich one. For example, the sexuality of plants, which Aristotle had denied, which Theophrastus had adverted to, is spoken of in positive terms; grafting, in more ways than one, and even budding, are spoken of in language which is remarkably precise for the words of a poet; and although to these operations were attributed powers which they did not possess, yet it is abundantly plain that the processes were thoroughly understood. The

> Angustus in ipso
> Fit nodo sinus; huc aliena ex arbore germen
> Includunt udoque docent inolescere libro,[1]

is as correct a description of the operation called budding as any modern could give in so many words; and it is impossible that such an operation should ever have been devised without a much more large and accurate knowledge of vegetable physiology than it is generally believed that the antients possessed.

From this time forward all inquiry into matters of science began to decline; under the later Roman emperors science became gradually extinguished; under the Byzantine princes it can scarcely be said to have been preserved, and the little attention it subsequently received from a few obscure writers rather hastened than arrested its downfall.

Upon the revival of science in Europe the writings of the classical and Arabian herbalists were taken as the text-books of the schools, but their errors were multiplied by false translations, their superstitions were admitted without question, and so little was added by the monkish authors, that between the time of Ebn Beithar, who flourished in the thirteenth century, and the year 1532, when the *Herbarum vivæ eicones* of Otho Brunsfels, a Bernese physician, made their appearance, scarcely a single addition had

[1] ["Angustus in ipso": the passage is taken from the second book of Virgil's *Georgics*, and was rendered by John Martyn as follows: "A small slit is to be made in the very knot; here they inclose a bud from a tree of another sort, and teach it to unite with the moist rind" (*The Georgicks of Virgil* (1741), p. 117). BE.]

been made to the slender stock of knowledge of about 1400 species, which are computed by Sprengel to have formed the total amount discovered by all botanists, Greek, Roman, and Arabian, up to the death of Abdallatif of Bagdad. Brunsfels describes the state of botany as being in his day most deplorable, as being principally in the hands of the most ignorant persons, and as consisting of a farrago of long and idle commentaries, disfigured 'by myriads of barbarous, obsolete, and ridiculous names.' He deserves to be mentioned as the first reformer in this science, and as the earliest writer who earnestly endeavoured to purify the corrupted streams which had flowed through so many ages of barbarism from the antient Greek and Roman fountains. His example was speedily followed by Tragus, Fuchsius, Matthiolus, and others; the knowledge of species rapidly augmented, partly by the examination of indigenous plants and partly by the remarks of the earlier travellers, who about the year 1460 had begun to turn their attention to the vegetable kingdom; till at last their abundance became so great as to call for the assistance of compilers capable of digesting what and [*sic*] already begun to be scattered through numberless works. The first undertaking of the kind was by Conrad Gesner, a native of Zürich, who died in the year 1565. This excellent man spent the latter part of his life in collecting materials for a general history of plants; he is stated to have caused above 1500 drawings to be prepared for the illustration of his undertaking, but, unfortunately, he died before his project was executed, and his materials were afterwards dispersed. He appears however to have brought about one most important change in science, by discovering that the distinctions and true nature of plants were to be sought in their organs of reproduction rather than in those of nutrition. This was assuredly the first step that had been taken forward in the science since the fall of the Roman Empire, and is abundant evidence of the great superiority of Gesner over all those who had preceded him. From this time collections of species were made by numerous writers; our countryman Turner, Dodoens, Lobel, Clusius, Cæsalpinus, and the Bauhins, were the most distinguished writers between the years 1550 and 1600; and among them the number of known species was so exceedingly increased, especially by the discoveries of Clusius, that it became impossible to reduce them into any order without the adoption of some principle of classification. Hence originated the first attempts at *systematical arrangement,* with which commences

The Second Æra. – It is to Matthew Lobel, a Dutch physician residing in England at the time of Elizabeth, that the honour is to be ascribed of having

been the first to strike out a method by which plants could be so arranged that those which are most alike should be placed next to each other, or in other words which should be an expression of their natural relations. As may be supposed, this early attempt at the discovery of a natural system was exceedingly rude and imperfect; it is however remarkable for having comprehended several combinations which are recognized at the present day: *Cucurbitaceæ, Stellatæ, Gramineæ, Labiatæ, Borragineæ, Leguminosæ, Filices*, were all distinctly indicated; and it may be added that under the name of *Asphodels* [*sic*] he grouped the principal part of modern petaloid monocotyledons. The reasons however why such groups were constituted were not then susceptible of definition; the true principles of classification had to be elicited by the long and patient study of succeeding ages. Among the foremost to take up this important subject was Cæsalpinus, a Roman physician attached to the court of Pope Sixtus V. This naturalist possessed a degree of insight into the science far beyond that of his age, and is memorable for the justness with which he appreciated many of the less obvious circumstances which his predecessors had overlooked. For example, he was aware of the circulation of the sap; he believed that its ascent from the roots was caused by heat; he knew that leaves are cortical expansions traversed by veins, proceeding in part from the liber; he estimated the pith of plants at its true value, and seeds he compared to eggs, in which there exists a vital principle without life; but he denied the existence of sexes in the vegetable kingdom. Improving upon the views of Gesner, he showed how great is the value of the fructification in systematic botany; the flower he said was nothing but the wrapper of the fruit; the essential part of the seed he considered to be what is called the corculum, that is the double cone of plumule and radicle which connects the cotyledons. In general his views of vegetable physiology were much more just than those of his predecessors, and if he did not avoid the error of supposing certain plants to be mere abortions of more perfect species, as many grasses of corn, he amply redeemed his fame by the correction of other mistakes. From differences in the fruit and the seed of plants, he formed a system, which, though purely artificial, and never much employed, had the merit of calling attention strongly to the existence of a class of important characters which had previously been either overlooked or undervalued.

But notwithstanding the attempts thus made by a few distinguished men to elevate the science to a higher station, and to reduce it to some

general principles, it still continued to languish and to remain for the most part in the hands of the most ignorant pretenders, and in no country more so than in England. We find, upon the authority of the celebrated Ray, that in this country in the middle of the seventeenth century it was in the most lamentable state. At that time the standard book of English botanists was a publication called Gerarde's 'Herbal,' which was, as Ray tells us, the production of a man almost entirely ignorant of the learned languages, in which nevertheless all books on science were at that time written. The principal part of the work was pirated from the 'Pemptades' of Dodoens, turned into English by one Priest, and, in order to conceal the plunder, the arrangement of Dodoens was exchanged for that of Lobel, while the whole was made up with the wood-blocks of Tabernæmontanus' Kräuterbuch, often unskilfully transposed and confounded. At last a change, as sudden as it was important, was produced in the science by the application of the microscope to botanical purposes.

The Third Æra. – About the middle of the seventeenth century this instrument was first employed in the examination of the elementary organs of plants, about which nothing had been previously learned since the time of Theophrastus. The discovery of spiral vessels by Henshaw in 1661, the examination of the cellular tissue by Hook at a somewhat later date, at once excited the attention of observers, and led at nearly the same time to the appearance of two works upon vegetable anatomy, which at once so nearly exhausted the subject, that it can scarcely be said to have again advanced till the beginning of the present century. Grew and Malpighi, the writers thus adverted to, but more especially the former, combined with rare powers of observation a degree of patience which few men have ever possessed. They each examined the anatomy of vegetation in its minutest details, the former principally in the abstract, the latter more comparatively with the animal kingdom. Various forms of cellular tissue, inter-cellular passages, spiral vessels, woody tubes, ducts, the nature of hairs, the true structure of wood, were made at once familiar to the botanist; the real nature of sexes in plants was demonstrated; and it is quite surprising to look back on those days from the present high ground on which botany has taken its stand, and to see how little the views of Grew at least have subsequently required correction. From him physiological botany, properly speaking, took its origin. Clear and distinct ideas of the true causes of vegetable phenomena gradually arose out of a consideration of the physical properties of the minute parts through

whose combined action they are brought about; and a solid foundation was laid for the theories of vegetation which subsequent botanists have propounded: to Grew may also be ascribed the honour of having first pointed the important difference between seeds with one cotyledon, and those with two, and of having thus been the discoverer of the two great natural classes into which the flowering part of the vegetable kingdom is now divided. Grew, however, was no systematist; it was reserved for another Englishman to discover the true principles of classification, and thus to commence

The Fourth Æra. – John Ray[1], a man of a capacious mind, of singular powers of observation, and of extensive learning, driven from his collegiate employments by the infamous commands of a profligate prince, sought consolation in the study of natural history, to which he had been attached from his youth. Botany he found was fast settling back into the chaos of the middle ages, partly beneath the weight of undigested materials, but more from the want of some fixed principles by which the knowledge of the day should be methodized. Profiting by the discoveries of Grew and the other vegetable anatomists, to which he added a great store of original observation, he in his 'Historia Plantarum,' the first volume of which appeared in 1686, embodied in one connected series all the facts that had been collected concerning the structure and functions of plants: to these he added an exposition of what he considered the philosophy of classification, as indicated partly by human reason, and partly by experience; and from the whole he deduced a classification which is unquestionably the basis of that which, under the name of the system of Jussieu, is every where recognized at the present day. For proofs of this, we refer our readers to the memoir of Ray in the present work: we will only observe in this place that he separated flowering from flowerless plants; that he divided the former into monocotyledons and dicotyledons, and that under these three heads he arranged a considerable number of groups, partly his own, partly taken from Lobel and others; which are substantially the same as what are received by botanists of the present day under the name of natural orders. It is singular enough that the merits of this arrangement of John Ray should have been so little appreciated by his contemporaries and immediate successors, as to have been but

[1] [The only work of John Ray's that Lindley owned was the 1703 edition of his *Methodus plantarum*. BE.]

little adopted; and that, instead of endeavouring to correct its errors and to remove its imperfections, botanists occupied themselves for several succeeding years in attempts at discovering other systems, the greater part of which were abandoned almost as soon as they were made known. Rivinus, Magnol, Tournefort, and Linnæus were the most celebrated of these writers; but the two last alone have had any permanent reputation. Tournefort, who for a long time stood at the head of the French school of botany, proposed, in 1694, a method of arrangement, in its principles entirely artificial, but which in some cases was accidentally in accordance with natural affinities. It was founded chiefly upon differences in the corolla, without the slightest reference to physiological peculiarities; and is now forgotten, except in consequence of its having furnished some useful ideas to Jussieu, as will be hereafter shown.

The Fifth Æra. – Linnæus was a genius of a different and a higher order. Educated in the severe school of adversity, accustomed from his earliest youth to estimate higher than all other things verbal accuracy and a logical precision, which are often most seductive when least applicable; endowed by nature with a most brilliant understanding, and capable, from constitutional strength, of any fatigue either of mind or body, this extraordinary man was destined to produce a revolution in botany, among other branches of natural history, which in some respects advanced and in other retarded its progress far more than the acts of any one who had preceded him. He found the phraseology bad, and he improved it; the nomenclature was awkward and inconvenient, he simplified it; the distinctions of genera and species, however much the former had been improved by Tournefort, were vague and too often empirical; he defined them with an apparent rigour, which the world thought admirable, but which Nature spurned; he found the classifications of his day so vague and uncertain, that no two persons were agreed as to their value, and for them he substituted a scheme of the most specious aspect, in which all things seemed as clearly circumscribed by rule and line as the fields in the map of an estate; he fancied he had gained the mastery over nature, that he had discovered a mighty spell that would bind her down to be dissected and anatomized, and the world believed him; in short, he seized upon all the wardrobe of creation, and his followers never doubted that the bodiless puppets which he set in action were really the divine soul and essence of the organic world. Such was Linnæus; the mighty spirit of his day. Let us do this great man that justice which exaggeration on the

one hand, and detraction on the other, have too often refused to him; and let us view his character soberly and without prejudice. We shall then admit that no naturalist has ever been his superior; and that he richly merited that high station in science which he held for so many years. His verbal accuracy, upon which his fame greatly depends, together with the remarkable terseness of his technical language, reduced the crude matter that was stored up in the folios of his predecessors into a form that was accessible to all men. He separated with singular skill the important from the unimportant in their descriptions. He arrayed their endless synonyms with a patience and lucid order that were quite inimitable. By requiring all species to be capable of a rigorous definition not exceeding twelve words, he purified botany of the endless varieties of the gardeners and herbalists; be applying the same strict principles to genera, and reducing every character to its differential terms, he got rid of all the cumbrous descriptions of the old writers. Finally, by the invention of an artificial system, every division of which was defined in the most rigorous manner, he was able so to classify all the materials thus purified and simplified, that it seemed as if every one could become a botanist without more previous study than would be required to learn how to discover words in a dictionary. Add to all this, the liveliness of his imagination, the skill with which he applied his botanical knowledge to practical objects, and the ingenuity he showed in turning to the purposes of his classification the newly-discovered sexes of plants, and we shall at once comprehend what it was that exalted Linnæus so far above his contemporaries. But great as the impulse undoubtedly was which Linnæus gave to botany, there were vices in his principles which, although overlooked during his life, have subsequently been productive of infinite evil. There is no such thing as a rigorous definition in natural history; this fact Ray had demonstrated to arise out of the very nature of things; and consequently the short phrases by which species and genera were characterized by Linnæus were found equally applicable to many other plants besides those for which they were intended: hence arose a new source of confusion, inferior only to that which it was intended to correct. Differential characters, which would be invaluable if we had all nature before us, were found in practice to lead to incessant errors, so soon as some new species was introduced into the calculation: they also laboured under the great fault of conveying no idea whatever of the general nature of the plants to which they were related: thus the

Portuguese botanist Loureiro[1], who attempted to determine the plants of China by the systematic writings of Linnæus fell into the singular error that the hydrangea was a primrose. With regard to his artificial system of classification, it was found that it looked better in the closet than in the field; that the neatness and accuracy of the distinctions upon which it was divided into groups existed only upon paper, and that exceptions without end encumbered it at every turn. This, which is perhaps inseparable from all systematic arrangements, would not have been felt as so great an evil, if there had been any secondary characters by which the primary ones could be checked, or if the system had really led with all its difficulties to a knowledge of things. But it was impossible not to perceive that it led in reality to little more than a knowledge of names, and that it could be looked upon as nothing beyond an index of genera and species. Let us repeat, however, that these objections were of little weight in the time of Linnæus; the force of many of them was hardly felt, when scarcely a twelfth part of the species now known to exist was upon record; and the world was naturally inclined to embrace with ardour the clearness and precision of the Linnean language, notwithstanding all its faults, in exchange for the cumbrous, vague, or unmethodical descriptions of those who preceded it. The great evil that has arisen out of the system of Linnæus has been this: that it has led to the formation of a large school of superficial botanists; of men who supposed that nomenclature and verbal criticism constitute the whole objects of that science; who have been distinguished more for their total neglect of everything beyond mere technicalities, than the old botanists for their disregard of the latter; who have had no general views, and apparently no power of applying their means to any intelligible end, and who, consequently, in the countries where they have flourished, have so far lessened the science in public estimation, and done as much to retard its progress as Linnæus did to advance it.

The maxims however of Ray, and the great general views of that illustrious naturalist, were destined not to fade even before the meteoric brilliancy that surrounded the throne of Linnæus. A French botanist, Antoine Laurent

[1] [Lindley's copy of Loureiro's *Flora Cochinchinensis* (1790) is now in the Lindley Library. On p. 104 Loureiro described *Hydrangea macrophylla*, under the name *Primula mutabilis*. BE.]

de Jussieu[1], soon entered the field to oppose the latter. In the year 1789, just eleven years after the death of Linnæus, he produced, under the name of 'Genera Plantarum,' an arrangement of plants according to their natural relations, in which the principles of the great English botanist are tacitly admitted, and his fundamental divisions adopted in combination in part with those of Tournefort, and in part with what are peculiar to the author himself. Jussieu possessed in a happier degree than any man that has succeeded him the art of adapting the simplicity and accuracy of the language of Linnæus to the exigencies of science, without encumbering himself with its pedantry. He knew the impossibility of employing any single characters to distinguish objects so variable in their nature as plants; and he clearly saw to what evils all artificial systems must of necessity give rise. Without pretending then to the conciseness of Linnæus in forming his generic characters, he rendered them as brief as was consistent with clearness; without peremptorily excluding all distinctions not derived from the fructification, he nevertheless made the latter the essential consideration; instead of defining his classes and orders by a few artificial marks, he formed them from a view of all the most essential parts of structure; and thus he collected under the same divisions all those plants which are most nearly allied to each other. Hence while a knowledge of one plant does not by any means lead to that of another in the system of Linnæus, it leads directly to the knowledge of many more in the classification of Jussieu; which has according gained the name of the natural system. This at once brought the science back to a healthy state; it demonstrated the possibility of reducing the characters of natural groups to words, contrary to the opinion of Linnæus, who found that task altogether beyond his powers; it did away with the necessity of artificial arrangements, and giving a death-blow to verbal botany, it laid the foundation of that beautiful but still imperfect superstructure, which has been erected by the labours of Brown, De Candolle, and others. If the system of Jussieu were not a return to that of Ray, modified only and improved by modern discoveries, we should certainly have taken this period for the commencement of

The *sixth* and latest *æra* in our science. But it was reserved for a man whose fame lies chiefly in the literary world to effect the last great revolution that the ideas of botanists have undergone. In 1790, one year

[1] [Lindley's copy of Jussieu's *Genera Plantarum* (1789) is now in the Lindley Library. BE.]

after the appearance of Jussieu's Genera Plantarum, the German poet Göthe[1] published a pamphlet called 'The Metamorphosis of Plants.' At that time the various organs of which plants consist had been pretty well ascertained, the distinctions between the leaf, the calyx, the corolla, the stamens, and the pistil, were in a great measure understood, and the botanists were not a few who fancied there was nothing more to learn about them. Nevertheless even in the time of Theophrastus a notion had existed that certain forms of leaves were mere modifications of others that appeared very different, as the angular leaves in croton of the round cotyledons or seminal leaves of that plant. Linnæus himself had entertained the opinion that all the parts of a flower are mere modifications of leaves whose period of development is anticipated (*prolepsis plantarum*); Ludwig in 1757, and more especially Wolff in 1768, had stated in express terms that all the organs of plants are reducible to the axis and its appendages, of the latter of which the leaf is to be taken as the universal type. But the theory of Linnæus was fanciful; Ludwig was a writer of too little authority in his day to succeed in establishing a doctrine so much at variance with received opinions; and the theory of Wolff was propounded in a paper upon the formation of the intestines in animals, which seems altogether to have escaped the observation of botanists. Entirely unacquainted with the writings of the two latter naturalists, but aware of the Prolepsis Plantarum of Linnæus, Göthe took up this important theory, and demonstrated that all those organs to which so many different names were applied, and which, in fact, have so many dissimilar functions to perform, were all modifications of one common type – the leaf; that the bract is a contracted leaf, the calyx a combination of several, the corolla a union of several more in a coloured state, the stamens contracted and coloured leaves with their parenchyma in a state of disintegration, and the pistil another arrangement of leaves rolled up and combined according to certain invariable laws. All this he stated in such clear and precise terms, the arguments upon which he supported his propositions were so simple and so just, and the whole

[1] [Goethe (the spelling Göthe was much used in England in the early nineteenth century): Lindley had copies of his *Versuch die Metamorphose der Pflanzen zu erklären* (1790), and the French translation by Gingins de la Sarraz (1829), as well as the 1837 French edition of his *Oeuvres d'histoire naturelle* with Turpin's illustrations, all now in the Lindley Library. BE.]

doctrine was explained in language so sober and philosophical, that the mere circumstance of its not having been immediately received all over the scientific world shows in the clearest light how baneful the influence of Linnean botany had already become; for this beautiful theory, which is the very corner-stone of structural botany, and which is now on all hands admitted to be unassailable, was treated as the idle dream of a poet, and neglected for above twenty years. It has however wrought a change in the ideas of mankind regarding the nature of plants which has already produced the most important results by banishing from the science the complicated and unintelligible distinctions and descriptions with which botany was formerly encumbered, by fixing the manifold combinations of the organs of plants at their true value, and by introducing more just ideas of vegetable physiology.

Here we must bring our sketch of the history of botany to a close. There is no longer any great discovery to announce as having produced a sudden and universal change in the science; its general principles are apparently well understood, and all that botanists of the present century have been able to do has been to work out those principles in detail, to substantiate or modify them by isolated observations, to combine into one consistent whole the multitude of species whose attributes are as numerous as themselves, and gradually to reduce into lucid order the seemingly discordant materials which constitute the vegetable kingdom. The rapidity with which this has been effecting of late years has been in proportion to the disappearance of the Linnean school; where the system of Linnæus has continued to prevail, as in Sweden, Spain, Portugal, and Italy, progress has been the slowest; where it has only maintained a doubtful struggle with the principles of Ray, as in Germany and England, advance has been more rapid; but it has only been in France, in which the doctrines of Linnæus never could take root, that the march of discovery has been steady and uninterrupted. At the present moment Great Britain, Germany, and France are in the same position; they are all freed from the prejudices of the Swedish school, and are proceeding with equal steps, all guided by the same sound and recognized principles.

The *useful purposes to which botany is applied* are so numerous, that we can only find room for a short explanation of the most remarkable. Agriculture and horticulture are the two arts with which its relation is the most obvious; for although a considerable part of all the practices in each of them grew out of mere experience, or was discovered by chance,

yet there is no possibility of improving them except by other fortunate accidents, or of advancing them at a more rapid rate unless by the application of vegetable physiology. The world, especially that part of it to which these arts belong, is little accustomed to trace to their source the common practices with which it has been familiar from its infancy; and it is far from suspecting that many of the operations which are intrusted to the most ignorant rustics have one by one and piecemeal been hit upon during the careful study of nature by philosophers whose names it never heard. Gardening and husbandry may be defined as the arts, firstly, of improving the quality of various useful plants, and, secondly, of increasing the quantity which a given space of earth is capable of producing.

To improve the quality of any one plant, and to render it better adapted to the uses of mankind upon scientific principles, is a very complicated process, and is to be effected in many different ways, all of which require an intimate knowledge of the nature of the vital actions of plants, and of the degree in which they are affected by either external or internal causes. For example, a particular kind of flax produces fibres which are too coarse for the manufacturer; it is impossible to know how those delicate elementary tubes are to be rendered fine without being aware of the manner in which vegetable tissue is affected by light, air, and earth. The flavour of some fruit is too acid; it is the botanist only who could have discovered how to increase the quantity of saccharine matter. Potatoes are sometimes watery and unfit for food; we learn from vegetable physiology that this is often caused by the leaves, in which the nutritious flour of the potato is originally formed, not being sufficiently exposed to solar light, the great agent in causing the production of vegetable secretions. The leaves of the tea plant are harmless and only slightly stimulating in certain latitudes, they become narcotic and unwholesome in others; this apparent puzzle is explained by the connexion that exists between climate and vegetation, a purely botanical question. Certain races of plants may exist, of which one is too vigorous, the other too debilitated for the purposes of the cultivator; the botanist shows how an intermediate race may be created, having the best qualities of both.

Certain vegetable productions are susceptible of being produced in particular latitudes, others are not, or not to any useful purpose: for instance, in England the vine will never yield grapes capable of making such wine as even that of champagne, nor will tobacco ever acquire that peculiar principle which gives it so great a value if grown in other countries;

and yet both these plants flourish in the soil of England. The botanist can explain why this is, and thus prevent the commencement of speculations which can never end except in loss and disappointment.

The quantity of produce which may be procured from a given space of ground varies very much according to the skill of the cultivator, but that skill is in reality the mere application of the rules of vegetable physiology to each particular case; an application that is most frequently made unconsciously, but which nevertheless is made. We are too apt to overlook causes in effects, and to ascribe the improvements we witness to a mere advance in art, without considering that that advance must have had a cause, and that the cause can only be the working of some master hand, which is afterwards blindly followed by the community. The crops of orchard fruit are doubled and trebled in many places; old exhausted races are replaced by young, vigorous, and prolific ones; the cider and perry farmer will feel the benefit of this, but he will forget that he owes the change to the patient skill of a vegetable physiologist. The produce of the potato is augmented in the same proportion; twice at least the ordinary quantity of this important article of food may now be obtained from every field: the peasant will feel the additional comfort thus diffused around him, but he will never have heard of the name of Knight; nor will he know after a few years that the produce of the land was ever smaller.

Nor is it alone to articles of food that this science is to be applied; next in importance to food are fire and shelter, both of which are mainly furnished by timber. The laws of nature which regulate the production of this substance are among the most curious in science; we possess the most absolute control over them; we hold in our very hands the means of regulating their action, and if we neglect them, as is too often the case, it is not science which is to blame, but those who undervalue and neglect her. Because trees will grow without assistance, and because, in spite of neglect and ignorance, timber is perpetually renewing itself upon the earth, we forget that either its rate of production may be accelerated, or its quality improved. The writer of this has seen plantations, in this country, made for particular purposes at a large expense, totally ruined, with reference to the objects of those who planted them, from ignorance of the simplest laws of vegetable physiology.

Some allusion has already been made to the important results which arise out of the study of the connexion between vegetation and climate. The quality of all vegetable productions is influenced essentially by

external causes; intensity of light, atmospheric pressure, humidity, temperature, and seasons, are the great agents which modify the tissue, which control development, and which regulate the formation of sensible properties. Various combinations of these and other external causes are what constitute diversities of climate, and it is therefore obvious that the connexion between the latter and vegetation is of the most intimate nature. But as this is a branch of the science of comparatively modern origin, there are few instances of its application: one of the most striking was the declaration of Mr. Royle[1], that cotton might be obtained in the East Indies equal to the finest from America, a prophecy which has already been fulfilled in consequence of the practical adoption of plans similar to those which he theoretically suggested. Can tea be cultivated as advantageously elsewhere as in China, and what are the causes of the failure of the attempt in Brazil, in Madeira, and in the Indian Archipelago? Here is a question of immense importance, involving the interests of millions of human beings, and affecting the pecuniary interests of Great Britain as much as any commercial problem ever did; the botanist, and the botanist only, can give a safe and certain answer to it.

The cases hitherto cited refer chiefly to the objects of vegetable physiology; systematic botany bears upon practice not less usefully, but in a different way. If the only advantage of classifying plants were to acquire the power of discovering their scientific names, even that would have a certain kind of interest, because it would ensure a uniformity of language in speaking of them; if it had the additional property of demonstrating the gradual connexion that is discoverable between all the beings in the organized part of the creation, of proving that there is an insensible transition from one form of living matter to another, without break or interruption, and of explaining in a clear and intelligible manner the nature of that universal harmony of which philosophers are used to talk, the interest and importance of botanical classifications would be still further enhanced; but the practical importance of them would still be extremely limited. It is only when we look to the coincidence between botanical affinities and sensible properties, and to the external

[1] [Royle's proposal about the potential for growing tea in India was made in his *Illustrations of the Botany of .. the Himalayan Mountains,* part 1 (1833), pp. 107–127; Lindley had reviewed this instalment enthusiastically in the *Athenaeum*, 7 December 1833, p. 829. BE.]

indications of internal qualities, that we perceive the great features of its utility to man. If the qualities of every plant required to be ascertained by a circuitous and tedious series of experiments, no life could be long enough for the task, nor, if it were, could any memory however powerful remember so extensive a series of facts; and if, under such circumstances, botanists whose whole life is occupied in the study should be unable to master the difficulties, systematic botany could never be applied at all to any useful purpose, because it must of necessity be far beyond the acquirement of those persons who would be most likely to have occasion to employ it. But it was long ago suspected that plants which agree with each other in organization also agree in the secretions which may be supposed to be the result of that organization. Linnæus, in his dissertation upon the properties of plants, declares that species of the same genus possess similar virtues; that those of the same natural order are near each other in properties, and that those which belong to the same natural class have also some relation to each other in their sensible properties. This doctrine is now admitted on all hands, among men of science, to be incontrovertible, and places the practical utility of systematic botany in the most striking light. Instead of endless experiments leading to multitudes of incongruous and isolated facts, the whole history of the medicinal or economical uses of the vegetable kingdom is reduced to a comparatively small number of general laws; and a student, instead of being compelled to entangle himself in a maze of specific distinctions, is only obliged in practice to make himself acquainted with the more striking groups; and having accomplished this, he is enabled to judge of the properties of a species he had never seen before, by what he knows of some other species to which it is related. Some idea of the extent to which this power of judging of plants *à priori* is practically useful may be formed from this – that supposing the vegetable kingdom to consist of 100,000 species, arranged in 6 or 7000 genera, the cast mass of characters required to distinguish them will be collected under about 300 heads, a knowledge of not more than two-thirds of which will be required for the purposes of the general observer. Thus the common hedge mallow is a mucilaginous, inert plant, whose woody tissue is tough enough to be manufactured into cordage; it has certain botanical characters, which are readily observed and remembered; and it belongs to a group of plants consisting of not fewer than 700 species. It is only necessary to understand the structure of the common mallow to recognize all the remainder of the group, and to

be aware of their uses and properties; so that a person in a foreign country who finds a plant agreeing with the mallow in those marks by which the *Malvaceous* order is known, although he should never have seen or heard of the plant before, would immediately recognize it to be mucilaginous and inert, and would expect to find its vegetable fibre tough enough to be manufactured into cordage. It is this class of facts which alone can lead with any certainty to the discovery in one country of substitutes for the useful plants of another; it has shown the similarity between the violet roots of Europe and one of the kinds of ipecacuanha of South America; that the astringency of the alum-root of the United States finds a parallel in those of the geraniums of England; that madder has its representative in the Isle of France, cinchona in India, and that Indian-rubber trees exist in the East as well as in the West.

It is not however every kind of systematic botany which leads to these important results: it is not arrangements, however clear, which depend upon accordances in one or two arbitrary and unimportant points of structure; but it is that philosophical view of nature which separates to the greatest distance species which are the most dissimilar in their organization, and which places side by side such as are more like each other than anything else, filling up all the space between such extremes upon exactly the same principle; till at last, take a species where you will, it will be found in the midst of its nearest kindred and most natural allies. This, which is called the natural system, will be explained hereafter under the head of CLASSIFICATIONS in botany.

Garden

John Lindley
Entry from the Penny Cyclopaedia[1]

GARDEN. A garden, as distinguished from a farm, is a piece of ground designed for the cultivation of plants not actually indispensable to man for food. While corn for flour, various roots and herbs for the sustenance of cattle, or tracts of pasture land on which animals destined for slaughter are maintained, constitute the essential features of a farm; a garden, even when exclusively occupied by culinary vegetables, is still a source of objects of luxury, not of first necessity; in a more extended sense, and as it usually exists at the present day, it is chiefly intended to gratify the senses and to minister to the more refined enjoyments of social life.

The possession of a garden is one of the most early indications of civilization in man, and it is only among the most brutal and degraded races of savages that it is altogether unknown; while we find such an appendage to a dwelling increased in magnificence, or diminished and neglected, with the prosperity or decline of the most mighty states. It is Lord Bacon who says that 'when ages do grow to civility and elegancy men come to build stately sooner than to garden finely, as if gardening were the greater perfection.'

According to Sir John Malcolm[2], the Persians had gardens from the period of their first king Mahabad. We learn from Xenophon that Cyrus considered them an indispensable appendage of his residences. 'Wherever he resides, or whatever place he visits in his dominions, he takes care that the *paradises* shall be filled with all that is beautiful and useful which the soil can produce.'

[1] [Vol. 11 (1838), pp. 70–74. Lindley's single major source for this article was Loudon's *Encyclopaedia of Gardening* (1834 edition, mis-cited here as 1835). But there are many differences and additions, particularly in the discussion of contemporary botanic gardens. BE.]

[2] [The reference is to Sir John Malcolm's *History of Persia* (I have used the second edition, 1829), but there is an error here, or a misremembering, on Lindley's part, possibly of the passage on vol. 1 p. 6: "Mah-abad left a numerous progeny… and, aided by divine power, he civilised them, giving them a taste for the arts of the luxuries of life." But Malcolm makes it clear that Mah-abad was a figure of myth, "a mere fable, allusive to the early condition of mankind" (ibid., p. 486). BE.]

(*Cyropæd*. v.)[1] And it appears upon the testimony of Pliny and other Roman authors, that among the same people small gardens existed, in which trees were arranged in straight lines and regular figures, the margins of the walks being planted with tufts of roses, violets, and other odoriferous flowering plants, while the trees consisted of kings grateful for their fragrance, as the cypress and the pine, or agreeable for their shade, as the plane and the common elm. The Greeks, in their most flourishing times, appear to have been equally attached to the formation of gardens, and even, in some respects, to the nicer parts of the art of gardening. The Oriental narcissus, violet, ivy, and rose, are mentioned as their favourite flowers, and terebinthinous trees as those which were chiefly valued for their fragrance. The rich and polished Athenians are represented by Mr. Meason[2] as having borrowed their gardening from Asia Minor. Myrtles and roses, the box and the lime-tree, were planted for clipping into artificial forms, while flowers and fruits were cultivated in the winter, and the violet was in profusion in the Athenian markets when snow was lying on the ground.

Theophrastus himself not only gives directions for gardening operations, many of which were fanciful enough, such as sowing rue with chips of fig-wood, and pulling up esculents by way of making them more tender, instead of cutting them; but he had a garden of his own which he left to ten of his friends to be preserved as a place of public resort for those who employed their leisure in letters and philosophy. (Diogen. Laert. v. 53.)[3] The instances of the kings Attalus Philometor and Mithridates, who

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[1] [*Cyropæd*. v. 'Paradises' are mentioned in the *Cyropaedia* (1.3.14), but this quotation is from Xenophon's *Oeconomicus* (4.13). Lindley may have come across the passage in Mason's *Essay on Design in Gardening* (1768; p. 7) or in Loudon's *Encyclopaedia of Gardening*, where the source is cited as *Memorab*. Lib. v 829. Lindley presumably adjusted the reference because the *Memorabilia* consists of only four books and does not mention these parks; but the similarly Socratic *Oeconomicus* was sometimes treated as a fifth book, as in the much-reprinted 1594 edition of Leunclavius, with which Loudon's reference corresponds. RS.]

[2] [Gilbert Laing Meason, *On the Landscape Architecture of the Great Painters of Italy* (Hullmandel, 1828); the passage cited is on pp. 3–4. BE.]

[3] [Diogenes Laertius, *De Vitis, Decretis et Responsis Celebrium Philosophorum Libri Decem*. Any number of editions Lindley might have known. The most prestigious edition of recent times had been Huebner's two-volume edition published in Leipzig in 1828–31; there was also a famous English edition, translated by multiple hands and published by Edward Brewster in 1688. BE.]

cultivated all sorts of poisonous plants in their gardens, are perhaps the earliest upon record of such places being occupied for medical purposes.

It is not to be supposed that gardens were neglected by the luxurious and wealthy Romans. The prodigious gardens of Lucullus, who introduced the cherry, the peach, and the apricot from the Persians, were derided by his Roman friends for their extraordinary sumptuosity. They are related to have consisted of immense artificial towers, large sheets of water, gigantic edifices jutting into the sea, and mountains raised where no hill had existed before. Such an example might be ridiculed by some, but was certain to be followed by others whose taste for splendour and profusion was supported by unbounded wealth; and accordingly the gardens of Sallust, of the emperors Nero and Hadrian, and of many of their subjects, are doubtless to be classed in the same order as those of Lucullus. It is however to be remembered that such gardens were rather more similar to an English park and garden combined than to a mere garden, in the modern sense of the word, and moreover were so uncommon as to be looked upon with wonder by the people among whom they were created. A common Roman garden must have been a very different place, if we are to take the description given by Virgil (*Georgic*, iv. 121) as at all a faithful sketch; for he speaks of nothing but endive (intyba), celery (apium), melons? (cucumis), narcissi, acanthus, roses, ivy, and myrtles. That they had various trees bearing fruit, as well as the common wild timber of the country, and many different kinds of flowers, must of course be admitted; but that all gardens, up to the most flourishing period of the Roman empire, must have been much alike in respect to the plants they contained, is manifest from the fact that hardly more than seventy plants of all descriptions are noticed by this poet, although he wrote professedly upon rural affairs. It is true that the Romans carried their passion for flowers so far that it became necessary to restrain it by sumptuary laws, and that cases of extreme profusion in the use of them are mentioned by historians. The institution of Floralia, or flower-feasts, the universal passion for garlands, the reproaches addressed by Cicero to Verres for having made the tour of Sicily in a litter, seated on roses and decked with festoons of flowers, are a sufficient evidence of this taste having been carried to an extent unknown at the present day; to say nothing of the prodigality of Heliogabalus, or of Cleopatra, the latter of whom is said by Athenæus to have paid upwards of 200 *l.* (an Egyptian talent) for roses expended at one supper. But notwithstanding this, the variety of plants that were cultivated in the gardens of both Greeks and Romans must have been extremely small.

Theophrastus speaks only of roses, gillyflowers, violets, narcissi, and iris, as used for decoration, to which the larkspur and gladiolus (hyacinthus), with the white lily, and a few others may be added. The great object of their admiration was roses, which were forced by plates of talc (said to have been as much as five feet long; but it is more probable that these *specularia* were sashes five feet long, glazed with talc) being placed over bushes watered with warm water. Pliny, in his 'Natural History,' does not enumerate above one thousand plants of all descriptions, a very small part of which were objects of cultivation. At the fall of the Roman empire the following appear, from Mr. Loudon's statement, to have been the principal garden plants, exclusive of common trees and flowers. 1. *Culinary plants*: – peas, beans, vetches, lentils, kidney-beans, gourds, cucumbers, melons, cabbages of many sorts, turnips, carrots, parsnips, beet, skirret, radishes, sorrel, asparagus, onion, garlic, and other alliaceous plants, endive, lettuce, succory, mustard, and other salads, parsley, celery, orach, alexanders, elecampane, fennel, chervil, and some others. 2. *Fruits*: – fig, almond, citron, peach, pomegranate, apricot, plums, and cherries; twenty-two sorts of apples, thirty-six sorts of pears, services, quinces, and medlars; many kind of grapes, mulberries, nuts, walnuts, chesnuts, stone-pines, or pignons, olives, and carobs. They forced flowers with sashes of talc, as has already been noticed, and also cucumbers; it is probable that they extended this practice even to fruits.

With the fall of the Roman empire the art of gardening seems to have been lost, and it was not until a long time after that gardens are again heard of. It was among the monks that the arts of cultivation were preserved, and in connection with monastic institutions gardens again became matter of history. In these religious institutions, which were in many respects the only spots where the arts of peace could find shelter during ages of rapine and violence, gardens continued to be cherished; and although the ignorance of the monks prevented their being rendered so useful as they might have been, yet, on the other hand, their sacred protection opposed an effectual barrier to the wild progress of destruction.

Among his many reformations, the re-establishment of gardens formed part of the policy of the emperor Charlemagne, who introduced the subject into his *capitularies,* commanding gardens to be formed throughout his dominions, and prescribing the very plants which were to be cultivated therein: and considering the state of learning in those days, it must be admitted that the list, short as it is, was prepared with good judgment; for it was made to contain the most useful plants then known for diet or medicine, as well as the favourite

ornamental flowers of the Romans. The reader of the present day may be amused at the list of what was thought in the eighth century deserving of an imperial edict, at a time when no one had heard of a garden except within the walls of a castle or a monastery (*Walafridi Strabi Hortulus*)[1]: – Roses, Lilies, Fenugreek, Costmary (Costus), Sage, Rue, Southernwood, Melons, Gourds (Cucurbitæ), Water Melons (Pepones), Kidney Beans, Cummin, Rosemary, Caraway, Lentils, Squills (?), Gladiolus, Tarragon, Cucumbers (Coloquintida), Heliotrope, Ammi majus, Suim [sic] angustifolium, Lettuce, Nigella sativa, Rocket (Eruca), Nasturtium, Dock, Alexanders, Parsley, Celery, Savin, Fennel, Dittany, Woodmint, Water Mint, Catmint, Centaury, Beet, Marsh Mallows, Carrot, Orach (Adripia), Kohl Rabi, Chives, Radishes, Onions, Madder, Beans, Chervil, Clary, Lovage, Anise, Succory, Mustard, Savory, Mint, Tansy, Poppy, Asarabacca, Hollyhocks, Parsnip, Blite, Cabbage, Leeks, Rocambole, Garlic, Teasel, Peas, Euphorbia Lathyris (Lacteridæ), Houseleek. From this proceeding of Charlemagne the revival of gardens may be said to date, for although there are few direct traces of their existence for some centuries, yet there is no reason whatever to suppose that they were ever again lost sight of. In the fourteenth century we find Matthæus Sylvaticus[2], a Mantuan physician, speaking of his own garden, and of a Colocasia cultivated in his greenhouse on the edge of a beautiful fountain, supposed to be Athamanta cretensis, which he says he brought out of Greece and planted in his garden. (*Pandect*. c. 197, 133.) It was however in Italy that the formation of gardens received a fresh impulse. Alfonso d'Este, duke of Ferrara, is recorded to have founded several botanic gardens in the 16th century, and especially one called Belvedere surrounded by the water of the Po. The example was followed by several nobles of Ferrara; John Brasavolo, the uncle of the botanist Musa Brasavolo, had a viridarium or greenhouse; another noble, of the name of Acciajuoli, had many rare plants in his garden; and the collections of this city, augmented

[1] [The *Hortulus* of Walahfrid Strabo, a 9th-century manuscript, was first printed in Nuremberg in 1512. I do not know what edition Lindley used, but the form of citation suggests it might have been the recent critical edition edited by Friedrich Reuss (*Walafridi Strabi Hortulus*, Würzburg, 1834). BE.]

[2] [Matthaeus Sylvaticus or Silvaticus (*c.*1280–*c.*1342) was the author of the *Liber Pandectarum Medicinae*, an encyclopaedic collection of observations on medicine and related matters. I do not know which edition Lindley was using, and cannot explain the "133". The British Library has a 1474 Bolognese edition, which has neither page numbers nor printers' signatures; but cap. CLXXXXVII does indeed contain an account of the "Collocasia" or "Culcasia". BE.]

annually by the commerce of its merchants with Greece and Asia, became so rich in new exotic plants as to become celebrated all over Europe. The Ferrara gardens were soon rivalled by those of the Venetians and Paduans, one of whom, Gaspard de Gabrichis, is said to have spared no expense to enrich his garden, not with costly edifices and vast architectural embellishments, but with plants before unknown. (Spreng. *de R.H.* iv. c. 3.)[1] The greatest and earliest garden however of this æra is generally considered to have been founded at Pisa, in 1544, by Cosmo de' Medici, on the banks of the Arno; which by the year 1555 had become so rich in plants by the exertions of Lucas Ghini and his successor Cæsalpinus, as to have been the admiration of Belon, no mean judge. Haller[2] indeed is of opinion that a greenhouse built by the bishop of Acquapendente dates from the year 1533, but this is at variance with the statement of Tiraboschi, who fixes the erection in the year 1545. Be this as it may, it is at least certain that about this period a public garden was formed at Bologna, others at Lucca, Naples, and Florence; and that at Verona one Cæsar Niclesola had two large greenhouses in which some very rare plants were preserved. (Pona, *It. Bald.* p. 9.)[3]

At this time Paris possessed no garden for its university; that of Montpellier had however been founded by Henri IV., and contained before the end of the sixteenth century upwards of 1300 French, Alpine, and Pyrenean plants, according to Olivier de Serres[4] (*Traité d'Agricult.,* 1600), and a famous garden had been created at Mans by Renate Bellaye, bishop of that city. In Germany too, the garden of Breslau, to which Tragus and Fuchs were attached, of Basle, Strasburg, and other places, were at this time in existence, and the since celebrated garden at Leyden had been founded in 1577, at the instance of Gerard Bontius.

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[1] [Curt Polycarp Joachim Sprengel, *Historia Rei Herbariae* (Amsterdam, 1807). Lindley's copy of this work is held in the Lindley Library. BE.]

[2] [I have not traced Haller's discussion of this. BE.]

[3] [Giovanni Pona, *Plantae seu Simplicia, ut Vocant, quae in Baldo Monte… Reperiuntur* (Verona, 1595, plus later editions). The Lindley Library holds only the version that Clusius published in his *Rariorum Plantarum Historia* (1601), and in that version the relevant passage occurs in vol. II, p. cccxxiii. "Cæsar Niclesola" is a mistake, mixing names from two successive lines of text, and the mistake is augmented by a typo; it should be Fabio de Nichesolis. BE.]

[4] [Olivier de Serres, *Le Theatre d'Agriculture et Mesnage des Champes* (1600). The Lindley Library has the 1663 Rouen edition, which did not form part of the original Lindley Library purchase. BE.]

The principal part of these establishments were founded for academical purposes; when they were formed for private gratification their owners must be considered very much in advance of their times, if we are to form an opinion from the state of private gardening in this country at the same time. Here the only purpose contemplated in the formation of a garden appears to have been an enclosed place in which the owner might walk in seclusion, or in which sport might be had with contrivances like mazes and labyrinths of close-cut hedges; a few fruit-trees were added; but no such object as that entertained by the refined Italians, of collecting rare and beautiful plants from foreign countries for pleasure or for scientific purposes, was thought of. In the gardens of Nonesuch, the palace of Henry VIII., executed about the year 1540, we hear of shady walks, columns and pyramids of marble, 'fountains that spout water one round the other like a pyramid, upon which are perched small birds that stream water out of their bills,' and of similar objects, but nothing of the more essential part of a garden – its plants. Pleasure-grounds of this description had existed in England from the time of the Conqueror. Upon this point Mr. Loudon has collected some curious information, but antiquaries have rarely attended to the subject, and a rich field of investigation certainly still remains open to whomsoever is disposed to enter upon it. It is stated by Fitzstephen that in the time of Henry II. (1154–1189) the citizens of London had large and beautiful gardens to their villas. In the reign of Edward I. (1272–1307) it may be collected from 'Holinshed's Chronicle,' 'that the cultivation of the garden was extended to the more curious and delicate productions; but the wars of York and Lancaster destroyed all these occupations, and gardens in general ceased to be more than pleasure-grounds or kitchen-gardens of the rudest kind till the time of Elizabeth. King James I. of Scotland describes the garden at Windsor Castle, where he was confined by Henry V., as a place set thick with trees, and alleys of hawthorn hedges, with an arbour in each corner, –

'And myddis every herbore might be sene
The scharp green swete jenepere.' – *The Quair*.[1]

[1] [*The Kingis Quair*, supposedly written by King James I of Scotland (1394–1437). This was discovered and first printed in 1783, and appeared in more than edition by the time Lindley was writing; Lindley could have found this in Sibbald's *Chronicle of Scottish Poetry* in 1802, but he didn't need to; the passage is quoted in Loudon. "Herbore" is a misprint for "herbere". BE.]

Much later (1512) the great Earl of Northumberland, whose household consisted of 160 persons, 'had but one gardener, who attended hourly in the garden for setting of erbis and clipping of knottis, and sweeping the said garden clean.' Nay, it should seem as if sometimes there was not even one; for among the workmen of the household is mentioned the gardener of the place where my lord lyeth, *if there be one*. (Loudon.)

In these remarks all reference is omitted to the gardens of the Arabs; about which almost nothing is known, but which seem to have been more deserving historical record than those of other contemporary nations. That this people in the height of their power paid great attention to botany, is well known to those who are familiar with that science. A learned work on rural affairs was written in the 12th century by Abu Zachariah Ebn Alva, a native of Seville, of which an epitome has been given by Casirius (*Bibl. Escurial,* i. 326, s.)[1]; and according to Mr. Loudon, this writer has left a list of plants cultivated in the garden of Seville, more extensive than that of the Greeks and Romans. In the 13th century the then Vizir of Cairo, Ebn-Beitar, a native of Malaga, was so much attached to botany that he visited all parts of the East for the express purpose of extending his knowledge of plants. His works are preserved in MSS. in the library of the Escurial, and it is said that although he scrupulously abstained from describing anything which he had not seen, yet he speaks of 2000 species more than Dioscorides[2]. (Spreng. i. 238.) It is only reasonable to suppose that such a man had a garden. We must however fix the period when gardens first began to be extensively improved, in the middle of the 16th century, when, as has been already shown, the rich Italians turned their attention to the introduction of new and rare plants. By the time that this new taste began to be fixed in the minds of Europeans, the numerous geographical discoveries that had been made by the Portuguese and Spaniards, had opened new and unheard-of sources from which the lovers of gardens were able to enrich

[1] [Michael Casiri [Casirius], *Bibliotheca Arabico-Hispana Escurialensis, sive Librorum Omnium Mss. quos Arabicè ab Auctoribus Magnum Partem Arabo-Hispanis Composita* (Madrid: Antonio Perez de Soto, 1770); the reference is not exact, and should be to pp. 323–338. Also, the name of the Arabic writer is given by Casirius as Abu Zacharia Jahia ben Mohamad ben Ahmad, vulgò Ebn Alvam. BE.]

[2] [Curt Polycarp Joachim Sprengel's edition of Dioscorides: *De Materia Medica Libri Quinque* (Leipzig, 1829–30). Lindley's copy of this work is held in the Lindley Library. BE.]

them. It would appear that the maize, the yam, tobacco, and the cotton-tree (Bombax) were brought to Europe by the Spaniards so early as the end of the 15th century (Barcia, *Hist*., i. 24)[1], and king Ferdinand is recorded to have preferred the pine-apple, brought home in Columbus's second voyage, to all other fruits. (Petr. Martyr. *Reb. Oc. Dec*. l. 2, b. 39.)[2]

It would be impossible to trace the progress of public taste in the construction of gardens any farther historically, without occupying more space than such a subject can have allotted to it in a work of this description. It may easily be conceived that from the time when the taste for gardens revived, up to the present period, there has been a gradual improvement in such places, commensurate with the wealth of individuals and the commercial power of nations, their peaceful habits, the security of property, and their general progress in settling the relations of social life. At the present day the most prosperous nation is Great Britain, and here the cultivation of gardens is unrivalled as a general national object: the most degraded are Spain and Portugal, and there a feeling for garden enjoyment is almost extinct. In the remainder of this article we shall offer a few remarks upon the most important causes which have contributed to bring gardens to their present improved condition, and conclude by a brief account of some of the most remarkable Botanical Gardens of the present day.

The first great step that was made by gardeners to advance their art beyond mere mechanical operations, was the invention of glasshouses, in which plants might be grown in an artificial climate, and protected from the inclemency of weather. Until this was effected, it is obvious that the cultivation of exotic plants in Europe, especially its northern kingdoms,

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[1] [Barcia's work, published under the name of Gabriel Cardenas z. Cano, was entitled *Ensayo Cronologico, para la Historia General de la Florida,* and was published in Madrid by the Officina Real in 1723, as a supplement to a new edition of the *Historia de la Florida* by the Inca Garcilaso de la Vega. The citation makes it unclear whether it is actually Barcia's work that is referred to, or the Inca Garcilaso's *Historia*. Either way I have been unable to trace the passage in question. Query: might it refer to the *Historia*, pp. 2–4, which contain a description of Florida and its natural products? BE.]

[2] [Peter Martyr d'Anghiera, *De Rebus Oceanicis et Orbe Novo Decades Tres* (first published 1516). I don't know which edition Lindley used, and can't make much sense of the reference. The only early edition in the British Library is a 1533 edition published in Basel by Johann Bebel; in that edition the relevant passage is in Book 4, fol. 51r. BE.]

must have been much circumscribed. Mr. Loudon refers the invention of greenhouses to Solomon de Caus, architect and engineer to the Elector Palatine, and who constructed the gardens at Heidelberg in 1619. But there can be no doubt that buildings of this description claim a higher antiquity. The specularia of the Romans, whether pieces of talc 5 feet long, or, as we rather suppose, sashes 5 feet long glazed with talc, were certainly used for the purpose of forcing roses and some other plants; they were essentially greenhouses, although perhaps more like our garden-frames. It is scarcely likely that where gardening survived, the learned men, in whose hands all such subject then were, would have been unacquainted with the existence of these specularia, and they would naturally endeavour to reconstruct them. Greenhouses certainly existed among the Italians in the middle of the 16th century, as has been already mentioned, and there is no reason to suppose they had then for the first time been thought of. In fact, the ancient viridarium seems to have been a room with one side of it glazed with sashes reaching from the top to the bottom, and resembling the old English conservatory. It may or may not have been heated; probably not, for it was chiefly Greek, Egyptian, and Levant plants that were at first cultivated as rarities by the wealthy Italians, and they required no artificial heat in Italy.

If heat was required, it would be supplied by stoves or such other contrivances as were used for domestic purposes. Ray[1] says, that in 1684 the greenhouse in the Apothecaries' garden at Chelsea was heated by means of embers placed in a hole in the floor; and it appears, from a section of a greenhouse in the Electoral garden at Manheim, published in 'Medicus Index Plantarum,'[2] that a German stove was used there as late as 1771. We however agree with Mr. Loudon in considering the invention of *glass-roofs* for greenhouses to be an æra from which the principal

[1] [The reference is to William Derham's edition of the *Philosophical Letters between the Late Learned Mr Ray and Several of his Ingenious Correspondents* (London, 1718), pp. 172, 176. BE.]

[2] [Friedrich Kasimir Medikus, *Index Plantarum Horti Electoralis Manheimiensis*, autore Frid. Casim. Medicus (Mannheim, 1771). Lindley's copy of this work is held in the Lindley Library, as one of three small pamphlets bound together in a single volume, the others being Wilcke's *Flora Gryphica* and Reichard's *Enumeratio Stirpium Horti Botanici Senckenbergiani*. Medikus' little book was printed on leaves 9.8 x 5.4cm in size, and in Lindley's copy each leaf has been painstakingly inserted into a larger leaf in order to fit the dimensions of the volume. BE.]

part of modern improvements takes its date. This happened in 1717, when Switzer[1] published the plan of a forcing-house, suggested by the Duke of Rutland's graperies at Belvoir Castle. Up to that time the want of light must have rendered it impossible to employ greenhouses for the growth of plants, either in winter or summer; they could only have been hybernatories, receptacles in which plants might be protected from wet or cold during winter, but from which they were transferred to the open air as soon as the spring became sufficiently mild. The substitution of glass-roofs, by increasing the quantity of light, put it at once in the power of the gardener to cultivate permanently in his greenhouse those natives of hot countries which are not capable of bearing the open air of Europe even during the summer. From the time of Switzer to the present day there has been a gradual improvement in the construction of greenhouses, the object being to supply the plants with as nearly the same amount of light when under the glass-roof, as they would have had in the open air. The modern invention of curvilinear iron-roofs has accomplished this end in a most remarkable degree; for they substitute an obstruction to light amounting only to 1/23 or 1/27 for a loss equivalent to 1/7 or even 1/5.

The mode of heating such houses has given the modern cultivator additional advantages of the greatest importance. Stoves of all kinds not only dry up the moisture of the atmosphere, but impregnate the air with gaseous exhalations unfavourable to vegetation. The substitution of flues, while it equalized the heat, was still worse than the stove in drying and deteriorating the air; the introduction of fermenting vegetable matter, such as tan in a pit, in the interior of the house, remedied this evil in some measure, but the application of steam-pipes or hot-water pipes has had the great advantage of obviating every inconvenience, and has given the gardener the power of modifying the heat and moisture of his greenhouse at pleasure. Add to this, the rapidity of communication between one country and another, the long peace with which Europe has been blessed, and the leisure it has given men to occupy themselves with domestic enjoyments, the great encouragement given to gardeners, the establishment of Horticultural Societies for the promotion of the art of gardening, and the discoveries made in vegetable physiology – add all these things to the improvements in greenhouses, under which name is

[1] [Lindley's dating for Switzer's publication is off; the reference should be to Switzer's *Practical Fruit Gardener* (London, 1724), pp. 301–304. BE.]

here included all descriptions of glass buildings for horticultural purposes, and there is no difficulty in accounting for the present flourishing condition of European gardens.

There is one point further that requires to be noticed, as contributing to this result, and that is, the extension of the education of the working gardener. Great numbers of gardeners are now well informed in the higher branches of their profession. Instead of trusting to certain empirical rules, or to *receipts* for gardening operations, as if growing a plant was much the same thing as making a pudding, they make themselves acquainted with the principles upon which their operations are conducted, they acquire a knowledge of botany and vegetable physiology, and some even of physical geography, and thus they place themselves in the only position from which they can securely advance to the improvement of their art. The necessity of these subjects forming a part of all gardeners' education cannot be too strongly insisted upon; the Horticultural Society of London have recognised their importance by requiring all the young men in their garden to pass an examination in such subjects, in addition to their possessing the usual gardeners' acquirements; and although people ignorant of such subjects themselves have been found absurd enough to blame the proceeding, there can be no doubt that the world will give the Society the credit they deserve for having been the first to set this most important example, which we trust will be followed by all such institutions through the country.

In noticing modern gardens we must necessarily confine ourselves to a few of the most remarkable, passing by entirely those of private individuals, and in general all second-rate public establishments. The reader who is desirous of procuring detailed information upon the subject will find an ample account of all the best modern gardens in Mr. Loudon's excellent *Encyclopaedia of Gardening,* edition of 1835, to which we have been much indebted for this article.

Although the restoration of gardens took place among the nobles of Italy, and many noble instances of wealth and taste applied to such purposes still remain, yet the political condition of that country is unfavourable to horticultural pursuits, and although there are gardens attached to most of the Italian cities, there are none of much note, except for their picturesque features and fine architectural embellishments. Those of Naples, Florence, and Monza near Milan, are the most remarkable, especially the last. This is described as seated in a park of 3000 acres, with a gently varied fertile

surface. It is well watered; 'the culinary, flower, botanic, and fruit gardens, orangeries and hothouses, are all good, and as well managed as the circumstances of the present vice-king will permit.' The river Lambro passes through the grounds. There is a double avenue leading to Milan planted with tulip-trees, magnolias, melias, robinias, and other flowering trees, interspersed with evergreens and American oaks, the whole having a very beautiful effect. Among other things there is in this garden a shrubbery composed entirely of Magnolia grandiflora, some specimens of which have attained a great height. The botanic garden contains a numerous collection of plants from all parts of the world. The hothouses are numerous, and shelter an immense number of orange and lemon trees, as well as other plants of ornament. Pine-apples are also grown with some success.

The Dutch, although too much attached to the stiff formal style of clipped hedges, straight walks, and architectural puerilities, have always had a great reputation as gardeners. Their wealth and their commerce with the Cape of Good Hope and the East Indies gave them for a while extraordinary advantages over other nations, and for a long time their garden of Leyden was considered the richest in Europe. It was begun in 1577; in 1633 it contained 1104 species, and was so rapidly enriched by the zeal of the wealthy Dutch merchants, that in 1720 no fewer than 6000 species were catalogued be Boerhaave, who was then professor of botany at Leyden. From this source was at one time obtained the principal part of the succulent and other plants native of the Cape of Good Hope. It was afterwards a good deal neglected, but is now renovated under the care of Dr. Blume. It was thus spoken of by the author of a 'Tour through South Holland,'[1] who visited it in 1830: – 'It does credit to all who belong to it, being kept in the highest possible order. Its walks are beautiful, and without a pebble; they are covered with a mixture of peat earth and the spent dust of tanners' oak bark. The garden is tastefully laid out in clumps of shrubbery in various forms, round which, on borders, are the various plants, named and numbered according to the system of Jussieu. The whole extent is seven acres; four of which have been added only a few years ago, and laid out in good taste by the late professor Brugmans, as a garden for the reception of medicinal plants, and for the use of medical students. Among the hothouse plants we saw a date-palm with fruit upon it, which tree the gardener said

[1] [*A Family Tour through South Holland* (London, 1831), p. 75. Lindley's quotation differs slightly in wording and punctuation from the original. BE.]

had been there 200 years.[’] It may be questioned whether the botanic garden at Leyden and its museum are not superior to the Jardin des Plantes and its museum in Paris. Taken altogether, we are of opinion that they had a decided preference, though they wanted the attraction of living animals.

In the Netherlands there are small public gardens, both at Antwerp and Ghent, and one of the finest in Europe at Brussels. Some years since it was a wretched place, scarcely deserving the name of a garden; but in 1826 it was removed to its present site on the boulevards, and entirely reformed. It now contains a range of hothouses, 400 feet long, ornamented with a rotunda and porticos, and an extensive collection of plants. The roof of the houses is formed of curvilinear iron bars, and the whole is heated by steam. The principal range is seated on a terrace, with several fountains and broad flights of steps in front of it; while on a lower level are two low ranges of pits for pine-apple plants and small tropical species. Opposite to the hothouses are the herbaceous grounds, laid out in a circular manner, and divided into small compartments for the Linnæan classification. (Forbes’s *Tour*.)[1] The author from whom this statement is taken complains of the ground being occupied by common forest trees and shrubs, with but little novelty or rarity among them.

Among the German sovereigns a taste for gardening has grown up in a degree unknown in any other country except among the English. A love of the beautiful, a fondness for natural objects, a quiet contented character, so characteristic of the German nations, has no doubt been the cause of this. In Loudon’s ‘History of Gardening,’ no fewer than ninety closely printed pages are occupied with short accounts of the principal gardens of Germany only. Of these we can only select those of Munich, Berlin, and Vienna.

The garden of Munich, under the direction of Dr. Von Martius, is extremely rich in plants that can be cultivated in greenhouses and hothouses, but poor in those species which require to be grown in the open air: this happens in consequence of the severity of the winter, which destroys even the holly. There is a very fine range of hothouses, containing numerous palms, succulent and other plants. It is however considered

[1] [James Forbes, *Journal of a Horticultural Tour through Germany, Belgium, and Part of France, in the Autumn of 1835* (London, 1837). Lindley’s copy, which he acquired by reviewing it for the *Athenaeum* (the title-page is inscribed “The Editor of the Athenaeum”), is held in the Lindley Library. BE.]

that the plants in the hothouses at Nymphenburg are much finer than those at Munich; the collection of palms contains larger specimens; but it excites the surprise of the English traveller to find Laurustinuses and Rhododendrons treated as greenhouse plants.

The botanic garden at Berlin has long been one of the great sources from which the gardens of Europe have derived supplies of new plants, chiefly from Brazil, Mexico, and the Cape of Good Hope, in which country the king of Prussia has maintained collectors. It contains many hothouses and greenhouses, each of which is often dedicated to the reception of plants of some one tribe only. There is one for Endogenous plants exclusively, another for ferns and palms, a third for New Holland plants, and others for heaths, Cape, New Holland, and Mexican plants; there are some very fine palms, and in all respects the collection of species is probably the most extensive in the world. Mr. Forbes, the gardener to the duke of Bedford, who visited it in 1837, speaks of it in terms of great admiration. He says he never before saw so many plants cultivated in pots. 'The numerous species of New Holland and Cape genera were quite astonishing, as well as the hardy and Alpine species.' In point of beauty however there is nothing in the garden of Berlin to be compared with the conservatory in the garden of Pfauen-inseln, one of the pleasure-gardens of the king of Prussia. This building is 120 feet long, 40 feet wide, and 42 feet high; it has a span roof, but the north side is of solid brick-work, having a gallery running along it, from which the visiter [*sic*] looks down upon the plants beneath. In this place are some noble palm-trees; Latania borbonica is 27 feet high, Pandanis utilis 23 feet high, a Dragon-tree 36 feet high, and many others of unusual magnificence. The Latania is placed in the middle of the conservatory, having the tub in which it grows concealed by ferns and various low-growing plants.

If the garden of Schönbrunn is less rich in plants than that of Berlin, it much excels it in the magnificence of its hothouses and greenhouses. The emperors of Austria have for above a century been anxious to render this garden the finest in the world; and no cost has been spared in sending gardeners to foreign countries in order to increase the collection. It is however chiefly by supplies from the tropical parts of America that this garden has been enriched. There are several ranges of glasshouses, one 270 feet long and 30 feet high, another 300 feet long and about the same height, and three lower ranges, each about 240 feet long. Nothing can exceed the beauty of the interior of some of these glass palaces, in

which the species are grouped with good taste, and which from their size allow the plants to grow with all their native tropical luxuriance.

Rivalling these imperial structures are the gardens of St. Petersburg, founded by the emperor Alexander on the Apothecaries' Island in the Neva. In a country with such a climate as Russia gardening can hardly exist except under glass roofs, and it is necessary to call in aid all the resources of art in order to overcome the difficulties of nature. It is not surprising then that in this situation the glasshouses should exceed in extent those of all other parts of Europe. Altogether there are 3624 feet of such buildings, forming a double parallelogram, the principal sides of which are 700 feet long and from 20 to 30 feet wide. The middle range is 40 feet high in the centre. All this vast extent of glass is heated by common flues. In the open ground there is a large collection of hardy plants, a quarter devoted to systematical botany for the purposes of students, an arboretum, and a division for medicinal species. One excellent feature in the internal arrangements of this garden is the placing the plants geographically, so that the most careless observer in proceeding through the different suites cannot fail to be struck with the changes in vegetation as he passes from Africa to America, to New Holland, to India, China, and so on.

In France gardening has never been in a very flourishing condition; it is true that great quantities of vegetables are raised for the market, that the fruits of France are justly celebrated for their excellence, and the flower-markets of Paris are well supplied; it is also true that numerous excellent works on gardening have been written in France. But for the quality of their fruit the French are chiefly indebted to their climate, for the abundant supply of the vegetable market to their peculiar cookery, and for the excellence of their written works rather to the ingenuity of a few clever men, than to the general habits of the community. In flowers their taste is rather that of the Romans than of other European nations, for they are contented with a few showy kinds of sweet-smelling flowers, especially roses. Their great public gardens remind one of the days of Henry VIII., and if it were not for the imposing effect produced by the architectural grandeur of the buildings with which they are associated, they would be quite contemptible as works of the nineteenth century. There no doubt are exceptions to this statement, but as a general fact it cannot be contradicted. The Garden of Plants at Paris, which is the largest of the public establishments in France to which the name of garden properly applies, is not an exception to this statement, so far as the plants it contains are concerned. In 1818 it consisted, in the

open air, of departments devoted to various purposes of teaching; there was an indifferent collection of hardy herbaceous plants, and hardy trees and shrubs, some puerile contrivances to aid the student of agriculture: the plants in the houses were ill cultivated, few in number for such a place, and altogether unworthy of the reputation the garden had gained. Since that period two large hothouses have been built, 72 feet long, 42 feet wide, and about 50 feet high, with iron span roofs and heated by steam, and undoubtedly the establishment is now progressing to a better state. But even now there are few judges of gardens who would assign the Jardin des Plantes a place among the first class of European gardens.

In Great Britain it has never been the policy of the government to offer direct encouragement to either science or art, except in an uncertain and sparing manner, but rather to throw the duty of fostering them upon the people. So far as gardening is concerned the government has been right; for if in this country such public gardens as we have enumerated are unknown; on the other hand no part of the Continent possesses such multitudes of good private gardens as Great Britain. That which in other countries is a luxury, provided for at the public expense, is here rendered a kind of necessity, which all persons, from the cottager to the noble, strive to possess. Nothing can be more beneficial to the community, or more advantageous to horticulture itself, than this difference, for the result is not here and there a magnificent garden, and all round it comparative sterility, but a universal garden over all the country. The chief English garden containing a large collection of plants is that of Kew, which is certainly the richest in the world in New Holland plants, and which was, during the late war, almost the only place in Europe to which exotic plants were introduced in considerable quantity. It contains a bad and ill-named or rather unnamed collection of hardy plants, and a good many small hothouses and greenhouses filled with rare plants; there is moreover an excellent kitchen-garden and forcing department. In consequence of this establishment having had a monopoly of government support for above 30 years, it has been the channel through which an enormous quantity of new plants have been introduced to Europe from all parts of the world. For many years however it was unworthy of the nation, from the illiberal manner in which it was conducted, a system of exclusive possession having been observed in it, which was most disgraceful to those by whose authority it was maintained, and who acted as if such gardens were supplied by the public purse for the private gratification of a few selfish courtiers, and not for either the crown or the country. Of late years however this system has been

abandoned, and the collection is as accessible as that of other nations. Next in importance among public gardens is that of the Horticultural Society, at Chiswick, near London. It was established at the expense of the members of the society, and was intended both as a place of experimental researches in horticultural science, and as a station whence the most valuable, useful, and ornamental plants of all kinds, might be distributed through the country; for which purposes its extent, amounting to 33 acres, was expected to be amply sufficient. It has now been instituted 17 years, and consists of – 1, an Arboretum, probably the richest in Europe in trees and shrubs that are ornamental; 2, of an orchard, beyond all comparison the most perfect collection of fruit-trees, of all descriptions, that has ever been formed; 3, of a few forcing-houses, now chiefly employed in the determination of the quality of different kinds of grapes; 4, of a kitchen-garden, in which trials are made of new vegetables, or of new methods of cultivation; but which is principally used as a school of practice for the improvement of the young gardeners in this branch of their art; and 5, of a few small hothouses and greenhouses filled with rare plants. It is moreover conducted as a kind of normal school for young men intended for gardeners, who are now obliged to pass an examination in the principles of their business before they are recommended to places. It was originally intended to erect a magnificent range of hothouses, but the mismanagement of the funds of the society by the late secretary has prevented that object being yet accomplished; it is however generally understood that this part of the plan, so far from being abandoned, will actually be commenced in a few months, now that the resources of the corporation have been invigorated by a more prudent and careful management. Even as it is, no association of individuals ever produced so marked an effect upon gardening in a few years as has been brought about by the enormous distributions of cuttings of improved fruit-trees, of the finest kinds of vegetable seeds, and of new plants mostly imported direct from the British colonies and from the west coast of America, made annually from the society's gardens, independently of the collections sent in return to all parts of the world.

The botanic garden of Edinburgh is one of the finest and best-managed in Europe. It consists of 16 acres, delightfully situated, and includes everything that can be required for the purposes of teaching. The houses are remarkably good, and the healthy condition of the plants deserving of all praise. It is particularly celebrated for its beautiful specimens of heaths. Besides these, there are botanic gardens at Glasgow, Liverpool, Cambridge,

and Oxford; fine public gardens in the towns of Sheffield, Manchester, and Birmingham; and a garden at Chelsea, belonging to the Apothecaries' Company, who maintain it for the use of the medical students of the London schools. The latter was once among the most celebrated in Europe, having been for nearly 50 years under the management of Philip Miller[1], the author of the 'Gardener's Dictionary,' and whom Linnæus called the 'prince of gardeners.' Its situation has however become unfavourable for a garden, in consequence of the number of houses with which it is surrounded; and the collection had latterly fallen into some disorder; but a commencement has lately been made by the present professor to re-arrange it, and it may again be expected to become an efficient school of botanical instruction.

The number of species included in Loudon's 'Hortus Britannicus,' or catalogue of the plants either cultivated in Great Britain or indigenous, amounted in 1830 to upwards of 25,000, exclusive of Cryptogamous plants; and although a vast number of deductions must be made, it is not improbable that there are at this time nearly as many species known in the different British collections.

Acknowledgements
The author thanks Richard Sanford for help with the reference to Xenophon.

[1] [Lindley owned the third edition of Miller's *Gardeners Dictionary*, 1737 (with the 1735 *Appendix to the Dictionary* bound in); this copy is in the Lindley Library. However, Lindley would have had ready access to other editions of Miller, in the Horticultural Society's Library, as well as at the Chelsea Physic Garden. BE.]

Lindley's contributions to the *Athenaeum*

Brent Elliott
c/o The RHS Lindley Library, The Royal Horticultural Society, London

John Lindley was a regular contributor to the weekly magazine *The Athenaeum* for many years, but his contributions have not previously been noted; there is no entry in Allford's bibliography. There is a simple reason for this omission: contributions to the *Athenaeum* were almost entirely anonymous, as was the case with so many of the literary magazines of the nineteenth century. Loudon's *Gardener's Magazine* was highly unusual in having most of the articles signed by their authors, as Sarah Dewis has pointed out in her recent study (Dewis, 2014: 50–53).

But there is a way of identifying many, though not all, of the contributors to the *Athenaeum*, for the editors' marked file of that journal survives, with attributions of authorship identified in ink – in the margins where possible, or in some bit of space at the end of entries that terminate within central columns. The journal's earliest years are not so treated; the annotations start with the issue of 5 June 1830, with the arrival of a new editor. And there are gaps, running in some cases into entire years (1832, 1835–38, 1844); since it seems unlikely that the habit, once begun, would have been abandoned, and since the editors' file in some cases contains duplicate unannotated volumes, I suspect that at some point in the past a disposal of duplicates resulted in the wrong volumes being thrown out.

The *Athenaeum*, having been started in 1828, was taken over by the *Nation* in 1921, and the editors' marked file moved to that journal's offices; similarly, in 1931, the *Nation* was merged with the *New Statesman*, and when I first used the marked file back in the 1970s, it was held in a basement room at the *New Statesman*'s offices. Since then it has been transferred to the library of the City University, where it can be consulted by appointment today.

The *Athenaeum*: introductory note on its history

The *Athenaeum* was launched in 1828 by James Silk Buckingham, the traveller and thorn in the side of the East India Company, with help from Henry Stebbing, who succeeded him as editor after a few weeks. The first issue (2 January 1828) included a statement of intent, probably written by Stebbing:

> We shall endeavour … first to lay a foundation of solid and useful knowledge, and on this to erect a superstructure of as much harmony, ornament, and beauty, as our own powers and the encouraging aid of those who approve the design, will enable us to construct. If the edifice so reared be worthy of the name we have chosen for it, and, like the Athenaeum of antiquity, should become the resort of the most distinguished philosophers, historians, orators, and poets of our day, – we shall endeavour so to arrange and illustrate their several compositions, that they may themselves be proud of the records of their fame, and that their admirers may deem them worthy of preservation among the permanent memorials of their times (Anon., 1828: 2).

And by the last issue for March that year (28 March, p. 300), in a note introducing the quarterly index, the editors could boast that their magazine was now "not only *the most comprehensive*, but also *the cheapest* periodical in existence". It was a weekly magazine, priced at eightpence an issue, devoted primarily to reviews of recent books, theatrical and musical performances in the capital, and a certain quantity of original articles.

Very quickly the *Athenaeum* became effectively the house organ of the Cambridge Conversazione Society, that group commonly nicknamed the Cambridge Apostles. Frederick Denison Maurice (who was later to found the Working Men's College, and Queen's College, the first higher-education college for women) succeeded Stebbing as the editor in July 1828, and he in turn was succeeded by John Sterling. Lindley would not have liked the *Athenaeum* in its early years; it was associated with what one Cambridge Apostle, Richard Chenevix Trench, called "that gallant band of Platonico-Wordsworthian-Coleridgean-anti-Utilitarians" (Trench I: 14). The early *Athenaeum* team were supporters of the establishment of King's College London, the anti-secularist rival to University College, where Lindley was Professor of Botany. But all was to change, fairly quickly: the magazine soon had financial problems, and after two and a half years of operation, it passed out of the hands of the Apostles, and Charles Wentworth Dilke became editor, his first issue appearing on 5 June 1830. The following year, he reduced the price to fourpence an issue, and the magazine's fortunes were transformed. As Leslie Marchand said in his standard history, "Dilke proved himself right. There was a large audience ready for the *Athenaeum* as soon as the price was reduced" (Marchand, 1941: 35).

The *Athenaeum* now entered its first period of glory, making a name for itself by attacking the practice of puffery (the promotion of favourite books by tame reviewers). Within a few years it was able to boast:

> Not only have we been the first to notice important works published in Great Britain, but France, Germany, and America have yielded tribute of their best. We believe, that, altogether, not less than one thousand volumes will be found to have been reviewed by us in the year 1832. The Reports of Societies, exceeding in number one hundred and fifty, have been, we believe, generally satisfactory – some indeed are exclusive, and by authority (Anon., 1833: 1).

And before long it was able to print the following testimony to its international readership:

> Mr. Bentley has, we think, judged rightly that a translation of the last work of the gossiping, travelling Prince Pückler Muskau would be interesting to the public; and the sincerity of our opinion is proved by our having noticed it at some length on its first appearance in Germany. We have nothing to add to our former translations except a short passage relating to ourselves – "I found in Sfax (the Prince writes) some French newspapers of a tolerably recent date, from which I learned something of the current events of Europe; I also found the English *Athenaeum*, wherein, singularly enough, I read, here in Africa, the first review, and that in *English*, of my *German* book with an *Italian* title." – Sfax is some sixty miles from Tunis. We mention this, for though the *Athenaeum*, it appears, is to be met with even in that remote corner of Africa, the place itself is not to be found in many maps (Anon., 1837: 263).

The editors of the *Athenaeum* during the years that Lindley contributed to its pages were:

> 1830–1846 Charles Wentworth Dilke (1799–1864), who had been an associate of Keats and Leigh Hunt, and was a noted literary scholar in addition to his work as editor; his son, also Charles Wentworth Dilke, first Baronet, was one of Prince Albert's team in the preparation of the Great Exhibition of 1851, and active in the affairs of the Royal Horticultural Society, for which he could be said to have given his life

(he died of a cold while representing the RHS at the International Horticultural Exhibition in St Petersburg); the third Charles Wentworth Dilke was the famous politician.

1846–1853 Thomas Kibble Hervey (1799–1859), poet and journalist.

1853–1869 William Hepworth Dixon (1821–1879), traveller and journalist, whose travel books on America and Russia were lively and controversial; his account of the Mormons, *Spiritual Wives* (1868), was accused of indecency by the *Pall Mall Gazette*, leading to a trial for libel at which the victorious Dixon was awarded damages of one farthing.

The *Athenaeum* and the Horticultural Society

From Dilke's accession to the editorship, one of the recurrent features of the *Athenaeum* was its coverage of the proceedings of learned societies. Marchand waxed enthusiastic about the magazine's functions as an organ of scientific enlightenment:

> In fact, a whole history of science in the Victorian era might be written from the pages of that journal alone, for it chronicled in detail the meetings of all the scientific societies, Geographical, Astronomical, Botanical, Horticultural, and Ornithological. It gave the fullest reports of the Royal Society, the Royal College of Physicians, and the British Association for the Advancement of Science. Moreover, Dilke secured the outstanding scientists in each field to make the reports: Airy, Herschel, Russell, Lindley, Yarrell, Bucher, Washington, Augustus De Morgan, Sedgwick, Playfair, and Lyell. In the late thirties and forties he devoted whole numbers for two or three consecutive weeks to complete reports of the annual meetings of the British Association (Marchand, 1941: 52–3).

A passage has already been quoted in which the magazine stated that much of its coverage of the proceedings of such societies was "exclusive, and by authority" (Anon., 1833: 1) – in other words, provided by the organisations themselves. Edwin Lankester was the Secretary of the Botanical section of the British Association for the Advancement of Science, so he presumably contributed the reports of that section's meetings. Similarly, we can conclude that Lindley, as Assistant (and later, Vice or Deputy) Secretary

of the Horticultural Society, was responsible for providing the notes on the Horticultural Society's meetings.

Not all the Society's meetings were reported in the *Athenaeum*; there were entire years (1838–39) when the coverage was hit-and-miss, and other meetings were omitted ad hoc, for whatever reason. But anyone interested in the history of the Horticultural Society should take note of the *Athenaeum* as a source; until the *Gardeners' Chronicle* started reporting regularly in the 1840s, the *Athenaeum* is probably the best single source for the records of meetings. Table 1 lists the reports on the Horticultural Society published in the *Athenaeum* from 1830 until 1861 and the end of Lindley's time as a contributor. Table 2 lists additional references to flower shows and other activities of the Society apart from the reports on meetings; these are frequently from the column entitled "Our weekly gossip", but also include accounts of the new gardens at Kensington. The authors of these additional pieces, when they can be identified from the editors' marginal annotations, were the various editors (Dilke, Hervey, Dixon); one Scott (not conclusively identified); Allan Cunningham, the poet and editor of Burns; and Frederick George Stephens, the Pre-Raphaelite painter and art historian.

Lindley as reviewer

From 1830 to 1840, Lindley reviewed botanical books for the *Athenaeum* on an intermittent basis. Marchand lists Lindley among "Other staff writers of 1830 and 1831" (Marchand, 1941: 222), but "staff writer" probably gives the wrong impression: he was an irregular contributor. Table 3 shows a list of the reviews identified in the margins of the editors' marked file as being by Lindley (or, in the case of the first entry in the series, "Lyndley").

This is obviously not a complete list of his contributions, for the years 1835–38 have no marginal annotations to confirm his authorship. For only one contribution in those years is there independent documentation for Lindley's role as reviewer: the review of James Forbes' *Horticultural Tour* in 1837, about which we can be confident because the *Athenaeum*'s review copy formed part of the purchase of Lindley's library in 1866. Nonetheless, some reviews in those missing years have the ring of Lindley's style or attitudes: a review of Castle's *Linnaean Artificial System of Botany*, and, with less confidence, a review of C.F. Ferris's curious little book *The Parterre* (about both of these reviews, see below). In the issue of 8 April 1837, pp. 241–2, appears a review of Henslow's *Principles* and of Raspail's

THE ATHENÆUM

Journal of English and Foreign Literature, Science, and the Fine Arts.

No. 1753. LONDON, SATURDAY, JUNE 1, 1861. PRICE FOURPENCE

THE ROYAL HORTICULTURAL FETES

ROYAL BOTANIC SOCIETY, REGENT'S PARK.

CIVIL SERVICE, WOOLWICH, &c.—

SUMMER VACATION.—A Gentleman,

MEMORY.—Dr. EDWARD PICK'S PUBLIC

A GRADUATE in HONOURS of CAM-

A LADY, who has been a Governess in several

MATRICULATION, &c.—The Rev. W.

FRENCH, Italian, German.—Dr. ALTSCHUL,

THE GOVERNESSES' INSTITUTION, 34,

A EUCLID SOCIETY (FOR PROMOTING

THE ARCHITECTURAL MUSEUM,

MR. MITCHELL, 33, Old Bond-street, W.

THE ROYAL HORTICULTURAL FETE.

THE NEW GARDENS.—CARDS of ADMISSION

THE NEW SOUTH KENSINGTON GARDEN.

MR. WESTERTON, Knightsbridge, begs to

ROYAL HORTICULTURAL SOCIETY.—

ROYAL HORTICULTURAL SOCIETY'S

MESSRS. LEADER & COCKS, 67 and 68,

GRAND FLOWER and FRUIT SHOWS,

RHS, LINDLEY LIBRARY

Fig. 7. **The *Athenaeum*.**

Nouveau Système, about the latter of which the reviewer speculates that "the bad spirit and bad taste in which it is written, and the bad reputation of its author, should, as we think most likely, prevent his book being read at all"; that sounds to me like Lindley.

Lindley was not the only reviewer who dealt with botanical matters for the *Athenaeum*; Edwin Lankester and P.B. Lord both contributed reviews, including reviews of Lindley's own works (see the article on the subject later in this issue). Some botanical works had reviews that were unattributed in the editors' annotations; for example, in the issue of 21 December 1833, p. 870, Lindley gave a scathing review to Castle's *Synopsis of Systematic Botany*, but immediately before it appeared a respectful review of Forbes' *Hortus Woburnensis*, which is unattributed. It may be that the editor carelessly intended Lindley's name to cover both pieces, but in other issues successive reviews by Lindley were very clearly distinguished.

Those who have not made Lindley's leaders in the *Gardeners' Chronicle* part of their diet may be surprised at the vein of sarcastic humour which can occasionally be found in his reviews. He performs a wonderful, if heavily

unfair, demolition job on Thomas Dick Lauder, who undertook in the 1830s to publish new pocket editions of the classics of the picturesque school of gardening: first Gilpin, then Uvedale Price. Gilpin had incorporated into his *Remarks on Forest Scenery* some observations on unusual trees, including the quasi-mythical upas tree of the East Indies; he had quoted some lines on the subject by Erasmus Darwin (whose poem *The Botanic Garden* bristled with appendices on every topic from volcanoes to the Portland vase, thus providing Gilpin with a model for digression). Lauder appended here a lengthy note setting readers right on the matter, pointing out that the legend of the poison tree was a heavy distortion of the fact that the sap of the Indonesian tree *Antiaris toxicaria* was used by the natives for poisoning arrows. Lindley had fun with the unfortunate Lauder:

> We happened to open the first volume of this work at p. 236, and our eyes rested on the following paragraph: – "On the eightieth minute the saliva flowed in streams from his mouth, mixed with froth. He retched violently, with excessive convulsive action of the pectoral muscles, but unable to vomit; he appeared in great agony." Thinking it some publication relating to surgery or animal physiology, we had closed the volume for the purpose of sending it to our friend Dr. Probe, for his opinion, when, to our astonishment, we perceived it labelled on the back, 'Gilpin's Forest Scenery.' Our finger remained by chance in the place where we had first opened the book, and we hastily turned back to the paragraph we have quoted, with a feeling of something like bewilderment. We began to think that some "glamour" had been cast over us, and when we found before and after the aforesaid paragraph, nothing but horrible histories of poisoning, we became fairly puzzled; we looked onwards, page after page – there was nothing but poisoning – backwards, page after page – and still nothing but poisoning. We next referred to the title-page, but the 'Remarks on Forest Scenery,' stamped in bold black letters, still stared us in the face. At last we discovered that, unfortunately for Sir Thomas Dick Lauder, we had opened his book in the middle of a story *sixteen pages long*, about the upas tree of Java, with which he illustrates an unlucky extract made by poor Mr. Gilpin, from Darwin's 'Botanic Garden.' – Such a case will serve, as well as a hundred, to give an idea of this new edition. The great object of its editor seems to have been to find a sufficient number of pegs upon

> which to hang extracts enough to fill a couple of 8vo. volumes; and in this he has certainly succeeded to admiration (11 January 1834, pp. 26–7).

The review of Ferris's *Parterre* mentioned earlier, which I think was probably Lindley's work, is worth quoting here as another example, especially since it is so hard to find any indication of anyone having read it.

> *The Parterre; or Whole Art of Forming Flower Gardens*, by C.F. Ferris Esq. – In these days of nut-shell knowledge, no one can be surprised in meeting with a treatise, which, within the space of forty-eight little pages, professes to promulgate the whole art of – anything! But Mr. Ferris does even less than most of the thumb-nail encyclopedists: a few vague directions, a few irrelevant quotations, a few absurd lithographs – *voilà tout,* as his friends the French gardeners would say. We used to fancy, that some slight knowledge of the effects and contrasts of colour, – that some little experience as to the succession of flowers, was expected from him, who understood and professed to teach the whole art of parterre-gardening; no such thing, according to Mr. Ferris, but he talks about the pretty ankles of the ladies of the court of Louis Quatorze, and *sprigs* his pages with passages from Byron (14 October 1837, p. 769).

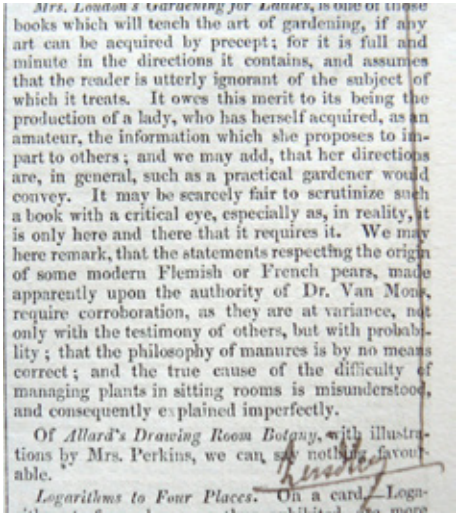
Ferris's book was slight, and the illustrations of parterre designs sometimes noteworthy for problems in perspective; for the historian, it is interesting evidence that the revival of the 17th-century parterre style was building up, rather than a likely influence on designers.

Lindley's great recurrent theme in his reviews, as in his books, was his attack on the Linnaean system of classification. Lindley was not the only botanist to urge the overthrow of Linnaeus (think of Robert Brown and W.J. Hooker), but he was undoubtedly the liveliest and most polemical. It is unfortunate that over the course of his career he came up with three different classification systems himself: not the best recommendation for a replacement system (see the *Athenaeum* review of Lindley's *Nixus Plantarum*, p. 141 below). And so we see, well into the late 1830s, proponents of the Linnaean system publishing textbooks for its use in schools, as a very handy and easily memorable means of classification. One such hardened

Linnaean was Thomas Castle, whom Lindley first tackled in a review on 21 December 1833 (p. 870): "Were Mr. Castle's book well executed, it would be perfectly useless; if it is intended, as we presume it is, for the use of certain medical students, we can only say, Alas! poor students." During the unannotated years, the *Athenaeum* published a review of another work of Castle's, which sounds to me like a return attack from Lindley:

> *The Linnean Artificial System of Botany illustrated and explained*, by Thomas Castle, M.D. – We have little doubt that this book will find favour in the eyes of those who delight in the imbecilities of Linnean classification. The author says that time has fixed the golden character of the Linnean artificial system, and that it is an *important sunbeam* (!) of science. We do not pretend to understand such very fine writing, but this we will venture to assert, and without fear of contradiction, that if, as its admirers allege, it is suited to the meanest capacities, those capacities must be very mean which require many illustrations to understand it (29 July 1837, p. 554).

The publication of a pamphlet of Charles Daubeny's a few years earlier had been greeted by Lindley as "a guarantee that the aimless puerilities


Mrs. London's Gardening for Ladies, is one of those books which will teach the art of gardening, if any art can be acquired by precept; for it is full and minute in the directions it contains, and assumes that the reader is utterly ignorant of the subject of which it treats. It owes this merit to its being the production of a lady, who has herself acquired, as an amateur, the information which she proposes to impart to others; and we may add, that her directions are, in general, such as a practical gardener would convey. It may be scarcely fair to scrutinize such a book with a critical eye, especially as, in reality, it is only here and there that it requires it. We may here remark, that the statements respecting the origin of some modern Flemish or French pears, made apparently upon the authority of Dr. Van Mons, require corroboration, as they are at variance, not only with the testimony of others, but with probability; that the philosophy of manures is by no means correct; and the true cause of the difficulty of managing plants in sitting rooms is misunderstood, and consequently explained imperfectly.

Of *Allard's Drawing Room Botany*, with illustrations by Mrs. Perkins, we can say nothing favourable.

Logarithms to Four Places. On a card.—Logan-

RHS, LINDLEY LIBRARY

Fig. 8. **The end of Lindley's review of Mrs Loudon's *Gardening for Ladies*, annotated to indicate authorship.**

of the Linnæan school are finally, and for ever, expelled from their last stronghold in England" (31 May 1834, p. 402).

Lindley's greatest praise, in his *Athenaeum* reviews, was given to John Forbes Royle for his *Illustrations of the Botany of the Himalayas,* not only for the quality of the plant descriptions but for its pioneering survey of the geographical distribution of plants in the area, and to Stephenson and Churchill for their *Medical Botany*, a new edition of which, revised by Gilbert Burnett, appeared in parts during his time as reviewer. He gave high, if qualified, praise to Loudon's *Encyclopaedia of Gardening* in its 1834 edition:

> its errors were extremely numerous: it was not free from expansions upon matters of faith, which had nothing to do with the subject, and which good taste should have suppressed; and the little botany it contained was of an indifferent description: but all these were as nothing compared with its importance as a key to everything known of horticulture at the time of its appearance (8 February 1834, p. 98).

(The "matters of faith" were Loudon's satirical remarks about the Garden of Eden, and his intermittent remarks about religion.) He was scathing about books that relied carelessly on others for their information; reviewing John Towers' *Domestic Gardener's Manual*, he observed that "[Walter] Nicol, a writer for the climate of Scotland, and [William] Forsyth, an obsolete English one, are the authorities that are followed; and constant misinformation, which is worse than no information at all, has been the unavoidable consequence" (19 February 1831, p. 116). Forsyth had been one of the founders of the Horticultural Society, but also the enemy of Thomas Andrew Knight, who was President of the Society at the time Lindley was writing, and whose views about the Society's early years had been absorbed by Lindley (see my comments on his 1861 article on the Society, which follows).

One article of Lindley's is worth particularly drawing attention to: his review in 1839 of Hooker's *Genera Filicum*, with its illustrations by Franz Bauer. Lindley had just spent a decade publishing some of Bauer's drawings, in his *Illustrations of Orchidaceous Plants* (published between 1830 and 1838).

> There are few persons acquainted with the higher departments of botany in this country, who have not regretted that the numberless

> beautiful drawings of the minute parts of plants, with which the portfolios of Mr. Bauer abound, should remain unpublished. It is well known, that this collection is unequalled, and that it includes matter of great scientific value, which, in any country but England, would long since have made its way before the public through the means either of booksellers or private persons. Yet the only series of drawings hitherto published from Mr. Bauer's designs, is one on Orchidaceæ, consisting of between thirty and forty plants, by Professor Lindley.

This is the only time I have spotted Lindley referring to himself in the third person in one of his anonymous articles. The editor's annotations in this case include some corrections that should have been spotted in proof, and the reference to "between thirty and forty plants" should have read "plates".

Lindley's reviews came to an end in 1840. For this cessation, as for his withdrawal from the *Penny Cyclopaedia*, there was a very simple reason: he was busy founding the *Gardeners' Chronicle*, which filled the time he formerly had available for periodical contributions. Edwin Lankester and others thenceforth dealt with botanical works. But Lindley returned in 1854, with an article about Crystal Palace Park, and then again in 1861, with a special article promoting the new garden the RHS was about to open in Kensington. There had already been an article by F.G. Stephens earlier in the year, written while the gardens were being completed, and Stephens would contribute another descriptive article to the subject in October; Lindley's article (1 June 1861, pp. 727–8) was timed to coincide as early as possible with the opening ceremony (5 June), and much of the text was devoted to the history of the newly renamed Royal Horticultural Society, and to the history of gardening in Britain as a background to the Society's formation. As this article has never been previously recognised as Lindley's, it is reproduced later in this volume (pp. 128–134).

Acknowledgements

The author thanks Sheila Munton and Chris Thorpe, successive librarians at the City University Library, for their help in providing access to the editors' marked file of the *Athenaeum*.

Table 1. **Reports on the Horticultural Society's meetings and shows in the *Athenaeum*.**

Year	Date	Page	Subject
1830	6 November	698	meeting 2 November
1830	11 December	778	meeting 1 December
1831	1 January	12	meeting 21 December
1831	8 January	27	meeting 4 January
1831	22 January	59	meeting 18 January
1831	5 February	91	meeting 1 February
1831	19 February	124	meeting 15 February
1831	5 March	155–6	meeting 1 March
1831	19 March	187	meeting 15 March
1831	9 April	235	meeting 5 April
1831	23 April	267	meeting 19 April
1831	7 May	299	meetings of 2–3 May [author identified as Scott]
1831	21 May	330	meetings of 17 & 18 May
1831	11 June	380	meetings of 1 & 7 June
1831	25 June	412	meeting 21 June
1831	9 July	444	meeting 5 July
1831	23 July	476	meeting 19 July
1831	6 August	507	meeting 2 August
1831	20 August	540	meeting 16 August
1831	10 September	588	meeting 6 September
1831	24 September	620	meeting 20 September
1831	8 October	650	meeting 4 October
1831	22 October	692	meeting 18 October
1831	5 November	724	meeting 1 November
1831	19 November	757	meeting 15 November
1831	10 December	805	meeting 6 December
1831	24 December	837	meeting 20 December
1832	21 January	51	meetings of 3 & 17 January
1832	11 February	98	meeting 7 February
1832	25 February	130	meeting 21 February
1832	10 March	163	meeting 6 March
1832	24 March	195	meeting 20 March
1832	7 April	227–8	meeting 3 April
1832	21 April	259	meeting 17 April
1832	5 May	290	meeting 1 May
1832	19 May	323	meeting 15 May
1832	9 June	372	exhibition of rhododendrons & azaleas, 5 June
1832	7 July	443	meeting 3 July
1832	21 July	475	meeting 17 July
1832	11 August	524	meeting 7 August
1832	27 October	699	meeting 16 October

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1832	10 November	732	meeting 6 November
1832	8 December	795	meeting 4 December
1833	19 January	44	meeting 15 January
1833	16 February	107	meeting 5 February
1833	16 March	171	meeting 5 March
1833	13 April	235	meeting 2 April
1833	20 April	251	meeting 16 April
1833	1 June	346	meeting 21 May
1833	15 June	387	meeting 4 June
1833	22 June	403	meeting 18 June
1833	27 July	500	meeting 16 July
1833	24 August	573	meetings of 6 & 20 August
1833	21 September	636	meetings of 3 & 17 September
1833	19 October	698	meetings of 1 & 15 October
1833	9 November	754	meeting 5 November
1833	7 December	834–5	meeting 3 December
1834	1 February	90	meeting 21 January
1834	8 February	106–7	meeting 4 February
1834	1 March	168	meeting 18 February
1834	15 March	209	meeting 4 March
1834	22 March	227	meeting 18 March
1834	3 May	337	meeting 15 April
1834	10 May	354	meetings of 1 & 6 May
1834	31 May	418	meeting 20 May
1834	21 June	475	meeting 17 June
1834	19 July	539–40	meetings of 1, 15 July
1834	6 September	659	meeting 2 September
1835	11 January	91	meeting 20 January
1835	21 February	153	meeting 3 February
1835	28 February	169	meeting 17 February
1835	28 March	250	meeting 17 March
1835	2 May	338–9	meeting 21 April
1835	16 May	378	meeting 5 May
1835	23 May	394	meeting 19 May
1835	18 July	550	meeting 7 July
1835	8 August	603	meeting 21 July
1835	24 October	804	meeting 20 October
1835	5 December	914	meeting 1 December
1836	23 January	72	meeting 19 January
1836	6 February	111	meeting 2 February
1836	16 April	275–6	meeting 5 April

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1836	30 April	313	meeting 19 April
1836	14 May	347	meeting 3 May
1836	28 May	386	meeting 17 May
1836	25 June	451	meeting 21 June
1836	23 July	524	meetings of 5 &19 July
1836	20 August	589	meeting 16 August
1836	17 September	676	meeting 6 September
1836	8 October	724	meeting 4 October
1836	22 October	755	meeting 18 October
1836	5 November	787	meeting 1 November
1836	10 December	875	meeting 6 December
1837	21 January	51	meeting 17 January
1837	11 February	107	meeting 7 February
1837	25 February	146	meeting 21 February
1837	11 March	179	meeting 7 March
1837	8 April	251	meeting 21 March
1837	29 April	307	meetings of 4 & 18 April
1837	27 May	386	meetings of 2 & 16 May
1837	22 July	539	meetings of 4 & 18 July
1837	26 August	629	meetings of 1 & 15 August
1837	30 September	730	meetings of 5 & 19 September
1837	23 December	915	meeting 5 December
1838	20 January	51	meeting 16 January
1838	10 March	187	meeting 6 March
1838	9 June	412	meeting 5 June
1839	4 May	337	meeting 1 May
1840	1 February	102	meeting 20 January
1840	15 February	138	meeting 4 February
1840	7 March	194	meetings of 18 February
1840	14 March	216	meeting 3 March
1840	4 April	277	meeting 17 March
1840	25 April	333	meeting 7 April
1840	9 May	377	meeting 21 April
1840	16 May	399	meetings of 1 & 5 May
1840	6 June	461	meeting 19 May
1840	20 June	501	meeting 2 June
1840	27 June	517	meeting 16 June
1840	18 July	575	meeting 7 July
1840	8 August	629	meeting 21 July
1840	22 August	664	meeting 4 August
1840	5 September	702	meeting 18 August

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1840	19 September	734	meeting 1 September
1840	31 October	876	meeting 15 September
1840	21 November	928	meeting 20 October
1840	19 December	1013	meeting 3 November
1840	26 December	1028	meeting 1 December
1841	30 January	96–7	meeting 19 January
1841	13 February	139–40	meeting 2 February
1841	27 February	173	meeting 16 February
1841	10 April	290–1	meeting 16 March
1841	17 April	308	meeting 6 April
1841	1 May	343	meeting 20 April
1841	22 May	411	meetings of 1 & 4 May
1841	23 October	813	meeting 5 October
1841	6 November	859–60	meeting 2 November
1841	18 December	980	meeting 7 December
1842	29 January	116	meeting 11 January
1842	19 February	171	meeting 1 February
1842	26 February	193	meeting 15 February
1842	12 March	234–5	meeting 1 March
1842	9 April	322	meeting 15 March
1842	16 April	347	meeting 5 April
1842	14 May	432	meetings of 2–3 May
1842	8 October	875–6	meeting 4 October
1842	5 November	956	meeting 2 November
1842	10 December	1067–8	meeting 6 December
1843	28 January	91	meeting 17 January
1843	18 February	165–6	meeting 7 February
1843	4 March	217–8	meeting 21 February
1843	18 March	267	meeting 7 March
1843	8 April	344–5	meeting 21 March
1843	22 April	393–4	meetings of 4 & 18 April
1843	13 May	468	meeting 1 May
1843	24 June	595–6	meeting 6 June
1843	15 July	653	meeting 4 July
1843	23 September	870	meeting 15 August
1843	30 September	886	meeting 19 September
1843	21 October	947–8	meetings of 3 & 17 October
1843	11 November	1011	meeting 7 November
1844	27 January	89	meeting 16 January
1844	16 March	250	meeting 20 February
1844	30 March	297	meetings of 5 & 18 March

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1844	20 April	362	meeting 2 April
1844	11 May	431	meetings of 16 April & 1 May
1844	18 May	458	meeting 7 May
1844	15 June	553	meeting 4 June
1844	13 July	649	meeting 3 July
1844	24 August	778–9	meeting 6 August
1844	14 September	831	meeting 3 September
1844	16 November	1050	meeting 5 November
1844	14 December	1148–9	meeting 6 December
1845	1 February	123	meeting 21 January
1845	15 March	271–2	meetings of 18 February & 4 March
1845	12 April	366–7	meetings of 18 March & 1 April
1845	26 April	413	meeting 15 April
1845	10 May	464	meeting 1 May
1845	17 May	491	meeting 6 May
1845	14 June	590	meeting 3 June
1845	4 October	971–2	meetings of July, August, & September
1845	18 October	1019	meeting 7 October
1845	15 November	1106	meeting 4 November
1845	13 December	1201	meeting 2 December
1846	31 January	124–5	meeting 20 January
1846	28 February	225	meeting 17 February
1846	28 March	323–4	meetings of 3, 17 March
1846	25 April	428–9	meeting 7 April
1846	2 May	456	meeting 21 April
1846	30 May	556	meetings of 1 & 5 May
1846	27 June	658	meeting 2 June
1846	18 July	736–7	meeting 7 July
1846	28 November	1222	meeting 3 November
1846	26 December	1327	meeting 1 December
1847	27 February	232	meetings of 19 January & 16 February
1847	20 March	312	meeting 2 March
1847	27 March	339	meeting 16 March
1847	15 May	523	meetings of 6 & 20 April
1847	29 May	574	meeting 1 May
1847	19 June	647–8	meeting 1 June
1847	24 July	793	meeting 6 July
1847	14 August	866	meeting 3 August
1847	16 October	1082	meeting 5 October
1847	13 November	1176	meeting 2 November
1848	8 January	40	meeting 7 December

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1848	29 January	116	meeting 18 January
1848	26 February	219	meeting 15 February
1848	25 March	320	meeting 7 March
1848	8 April	369	meeting 21 March
1848	15 April	392–3	meeting 4 April
1848	1 July	657–8	meetings of 18 April, 1–2 May
1848	15 July	705	meeting 4 July
1848	12 August	808	meeting 1 August
1848	16 September	936	meeting 5 September
1848	21 October	1056	meeting 3 October
1848	2 December	1211	meeting 7 November
1848	23 December	1300	meeting 5 December
1849	3 March	228	meeting 20 February
1849	31 March	333–4	meeting 6 March
1849	21 April	412–3	meeting 3 April
1849	12 May	492–3	meeting 17 April
1849	18 August	842	meetings of 17 July & 7 August
1849	24 November	1182–3	meeting 6 November
1849	15 December	1277	meeting 4 December
1850	30 March	347–8	meeting 19 March
1850	11 May	506	meeting [date not given]
1850	8 June	614	meeting [date not given]
1850	23 November	1220	meeting [date not given]
1850	14 December	1315	meeting [date not given]
1851	25 January	114	meeting 14 January
1852	27 March	358	meeting 16 March
1852	17 April	432	meeting 6 April
1852	7 August	849	meeting 20 July
1852	30 October	1182–3	meeting 16 October
1852	6 November	1214	meeting 2 November
1852	11 December	1363	meeting 7 December
1853	29 January	140	meeting 18 January
1853	26 February	261	meeting 15 February
1853	5 March	293	meeting 1 March
1853	19 March	355–6	meeting 15 March
1853	16 April	481	meeting 5 April
1853	30 April	531	meeting 19 April
1853	21 May	621	meeting 2 May
1853	28 May	652	meeting 24 May
1853	9 July	830	meeting 28 June
1853	6 August	946–7	meeting 26 July
1853	29 October	1294	meeting 18 October

Table 1. **Reports on the Horticultural Society's meetings (cont.).**

Year	Date	Page	Subject
1853	12 November	1359	meeting 1 November
1853	17 December	1520	meeting 6 December
1854	4 March	281–2	meeting 21 February
1854	18 March	345	meeting 7 March
1854	25 March	377	meeting 21 March
1854	8 April	442	meeting 4 April
1854	22 April	496	meeting 18 April
1854	6 May	558	meeting 1 May
1854	3 June	690	meeting 23 May
1854	19 August	1020–1	meeting 25 July
1854	11 November	1371	meeting 17 October
1854	18 November	1401–2	meeting 7 November
1854	9 December	1497–8	meeting 5 December
1855	10 February	175	meeting 6 February
1855	17 March	326–7	meeting 6 March
1855	21 April	465	meeting 3 April
1855	12 May	557	meeting 1 May
1855	19 May	589–90	meeting 8 May
1855	1 December	1403–4	meeting 20 November
1856	9 February	175	meeting 5 February
1856	8 March	301	meeting 26 February
1856	22 March	364	meeting 18 March
1856	25 October	1311	meeting 24 September
1856	6 December	1501	meeting 25 November
1857	14 February	216–7	meeting 3 February
1857	14 March	346	meeting 3 March
1857	18 April	506	meeting 7 April
1857	23 May	665–6	meetings of 1, 5 May
1857	25 July	947	meeting 7 July
1857	31 October	1360–1	meeting 13 October
1857	5 December	1521	meeting 1 December
1860	28 January	138	Special General Meeting 20 January
1860	4 February	176	meeting 31 January
1860	3 March	307	meeting 28 February
1860	31 March	446–7	meeting 27 March
1860	21 April	549	Special general Meeting 17 April
1860	26 May	723–4	meeting 22 May
1860	30 June	894	meeting 26 June
1860	28 July	130	meeting 24 July [author identified as Dixon]
1860	8 September	328	Special General Meeting, 4 September
1861	22 June	835	meeting 15 June

Table 2. **Other notes and articles on the Horticultural Society in the *Athenaeum*.**

Year	Date	Page	Subject	Author
1842	21 May	458	Our weekly gossip. First exhibition of the season	
1842	18 June	547	Our weekly gossip. Fête at Chiswick	
1842	17 December	1090	Our weekly gossip.	
1844	6 July	625	Our weekly gossip.	
1847	24 July	791	Our weekly gossip. Final Chiswick fête of the season	Hervey
1848	27 May	534	Our weekly gossip. First Chiswick fête of the season	Cunningham
1854	20 May	623	Our weekly gossip. Chiswick show	
1854	10 June	720	Our weekly gossip. Chiswick fête	Dixon
1855	28 April	491	Our weekly gossip. Gore House exhibition	Dixon
1855	14 July	815	Our weekly gossip. Last Chiswick show of season	Dixon
1855	28 July	876	Our weekly gossip. Chiswick show – additional	Dixon
1855	27 October	1243	Our weekly gossip. [including letter from Lindley]	Dilke
1855	22 December	1500	Our weekly gossip.	Dixon
1855	29 December	1535	Our weekly gossip.	Dixon
1856	12 April	461	Our weekly gossip.	Dixon
1856	28 June	813	Our weekly gossip. Special general meeting	Dixon
1858	24 April	531	Our weekly gossip. Exhibition at St James's Hall	Dixon
1859	9 July	50	Horticultural Society.	Dixon
1859	27 August	275–6	Our weekly gossip.	Dixon
1859	17 September	376	Our weekly gossip.	Dixon
1859	19 November	670	Our weekly gossip.	Dixon
1860	21 January	97	Our weekly gossip.	Dixon
1860	11 February	211	Our weekly gossip.	Dixon
1860	23 June	856	Our weekly gossip.	Dixon
1860	27 October	555	Our weekly gossip.	Dixon
1860	29 December	912	Our weekly gossip.	Dixon
1861	16 February	232	Our weekly gossip.	Dixon
1861	16 March	362	Horticultural Society's New Gardens.	Stephens
1861	30 March	437	Fine-art gossip.	Stephens
1861	11 May	632	Our weekly gossip.	Dixon
1861	18 May	670	Fine Arts Committee	
1861	1 June	727–8	Royal Horticultural Gardens	Lindley
1861	8 June	766	Our weekly gossip.	Dixon
1861	15 June	800	Royal Horticultural Gardens	Stephens
1861	22 june	833	Our weekly gossip.	Dixon
1861	29 June	864	Our weekly gossip.	Dixon
1861	13 July	52	Our weekly gossip.	Dixon
1861	19 October	509	Horticultural Gardens, South Kensington	Stephens

Table 3. **Lindley's contributions to the *Athenaeum*, as identified in the editors' marked file.**

Year	Date	Page	Subject
1831	19 February	115–6	Review of Towers, *The Domestic Gardener's Manual* [signed Lyndley]
1831	30 April	279	Review of Hooker's *Botanical Miscellany*, parts 1–5
1831	14 May	311	Review of Stephenson & Churchill, *Medical Botany*
1833	16 March	167	Review of *Zoological Magazine*
1833	6 April	214	Review of Stephenson & Churchill, *Medical Botany,* as revised by Gilbert T. Burnett
1833	7 December	829	Review of Royle, *Illustrations of the Botany of the Himalayan Mountains*, Part 1
1833	21 December	870	Review of Castle, *Synopsis of Systematic Botany*
1834	11 January	26–7	Review of Lauder's edition of Gilpin, *Remarks on Forest Scenery*
1834	8 February	97–8	Review of Loudon, *Encyclopaedia of Gardening*, Parts I-II
1834	3 March	44	Review of Hooker's *Botanical Miscellany*
1834	31 May	401–2	Review of Daubeny, *Inaugural Lecture on the Study of Botany*
1839	12 January	24	Review of Bauer/Hooker, *Genera Filicum*
1839	12 January	29	Our Library Table: reviews of Keith's *Botanical Lexicon*, and M'Intosh's *Greenhouse*
1839	19 January	50	Our Library Table: reviews of Irvine's *London Flora* & Cooper's Catalogue of the British Natural Orders and Genera [cut out template]
1839	26 January	64	Review of Hooker, *Botany of Beechey's Voyage*, Part VI, and *Flora Boreali-Americana*
1839	29 June	483	Our Library Table: review of De Candolle, *Vegetable Organography*
1840	8 February	114	Economy of Vegetation
1840	8 February	114	Review of Loudon's edition of Repton, *Landscape Gardening and Landscape Architecture*
1840	7 March	182	Review of Kollar, *Treatise on Insects*
1840	14 March	212	Review of M'Intosh, *Practical Gardener*, and of anonymous work *The Bouquet*
1840	9 May	372	Review of Piggott on carnation, Rogers, *Vegetable Cultivator*; Baxter, *British Phaenogamous Botany*; Leighton, *Flora of Shropshire* part 2; and *Paxton's Magazine of Botany*
1840	4 July	530–1	Review of M'Intosh, *New Practical Gardener*, and *Hooker's Journal of Botany*
1840	1 August	609	Review of Royle, *Illustrations of the Botany of the Himalayan Mountains*, Part 10; Mrs Loudon, *Gardening for Ladies*; Allard, *Drawing Room Botany*
1854	24 June	780	The Crystal Palace Garden
1861	1 June	727–8	Royal Horticultural Gardens

The RHS and its Garden in Kensington

John Lindley
From the Athenaeum[1]

Royal Horticultural Gardens

The new Horticultural Gardens at South Kensington will be opened on Wednesday next, the 5th of June, for the first season.

Not many years ago the ground there, already occupied by mansions of the great and wealthy, and the popular Department of Science and art – a nucleus round which other public galleries and museums must soon cluster – was a region of meadows, nurseries and third-rate suburban residences. In the centre of this quarter, the Horticultural Society, now become Royal, has planted a noble garden, surrounded by long Italian arcades – the graceful examples of a change in public taste – which suggest for the district the appropriate name of Arcadia, by way of distinction from Belgravia and Tyburnia. Twenty-two acres thus inclosed have been formed into levels, the lowest of which looks to Brompton, and the highest or northern to Hyde Park, while an intermediate elevation forms the larger portion of the area. In the centre of the northern boundary stands a vast conservatory, destined to become the habitation of all that is rarest or most beautiful in the vegetation of temperate climates; from a gallery in its interior access will be gained to the top of the arcades, which may become an agreeable promenade overlooking the whole of the garden. The latter has been laid out with walks, flower borders, grassy slopes, thickets of evergreens, and trees for shade, among which are introduced basins, fountains and canals, while bridges and terraced ways furnish easy access from one level to another, securing admirable points of view. The whole will be ornamented, by degrees, with vases, statuary, and other works of Art suited to garden decoration, among which will be the Memorial to the Great Exhibition of 1851, now approaching completion in the hands of Mr. Durham. Eventually, the arcades themselves may become galleries of sculpture, for which they are well adapted.

This sketch, slight as it is, shows that the Arcadian Garden is not an example of what is called the English style; that it will offer no illustration of the precepts of Repton, Gilpin and Uvedale Price; but that it is a

[1] 1 June 1861, pp. 727–728.

purely geometrical arrangement, in which architecture and sculpture are scarcely subordinate features. In some respects, indeed, it approaches the earliest form of English design when "herbers were delectable in a garden, with the walks and alleys partly devised in the same," and when "knots, curious, fine, rare of flourishing," and of all sorts of forms, "triangular square, square triangular," or even "square circular," were the fashion. In truth, the principles of landscape gardening were not applicable at South Kensington. It was impossible to represent wild nature in a frame; the problem to be solve was how to reconcile the exigencies of a garden for the enjoyment of large masses of people, with the striking architectural features in which it was inclosed. In former days, when the principal materials out of which to form a pleasure-garden of "tender herbes and pleasant flowers" consisted of "marjoram, saverie, herbe Fluelline, buglosse, the blessed thistle, Angelica, Baume, annis, dizany, sorrel, strawberries, paeony, lavender gentle, lettuce, artichoke," and so on through about a score more now-forgotten names, no arrangement consistent with modern ideas of horticultural beauty was possible; nor could such plants be made to harmonize with any kind of architecture, except the gloomy courts and cloisters of a monastery.[1]

But the scene is changed; the earth has been ransacked by skilful collectors of exotic plants, and we now possess all that is most graceful in form or brilliant in colour in the vegetable world. Horticultural skill, too, has arrived at such perfection, that even form and colour have themselves become controllable by Art, and wild Nature, when she refuses to supply the features that are wanted, has been forced to assume them at the bidding of the gardener.

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[1] [Lindley and the formal garden. Lindley had to a great extent changed his tone since his lecture, published in the *Journal of the Horticultural Society* in 1848, on Elizabethan gardening, in which he denounced the gardens of the sixteenth and early seventeenth centuries as displaying "a most Lilliputian grasp of mind and imagination", and urged his contemporaries, who were reviving Elizabethan architectural style in domestic buildings, never to try to revive the gardens of the period they were emulating. "There is no wide expanse of surface; no undulation is spoken of", etc. (Lindley, 1848); the idea that a garden view could be enclosed and still have a good effect was not part of Lindley's aesthetic framework at that time. Whether he had become more used to the results of the style in the intervening decade, or he was making a special case for a garden which was in an urban setting and needed to be screened from traffic, is an interesting question. BE.]

It is worth a little inquiry to learn how this has been brought about. In one of the earliest accounts we have of English ornamental gardens, that of Didymus Mountain, published at the end of the sixteenth century, the handsomest flowers he could name were jasmines, damask roses, rose campines, pinks, heartsease (how unlike our modern pansies!), gillyflowers and carnations, – shortlived plants of little use for decoration as the word is now applied. An artificial climate created by heating contrivances was unheard of, and, consequently, no plants from countries warmer than our own could be cultivated. Even the hardy flowers of the East, – the anemone, ranunculus and hyacinth of Syria and Persia, – had not found their way from Constantinople to the West. By the middle of the seventeenth century, although the art of heating had begun to be practised, the paucity of plants suitable for ornamental purposes had not greatly diminished. We now hear of oranges, myrtles and oleanders, which must have been preserved during winter in heated rooms, and it is certain that pine-apples were made to ripen at Hampton Court in the reign of Charles the Second. But although the invention of greenhouses had a most important bearing on the introduction of tender exotics, yet it afforded so little aid to external decoration that in 1737, when the famous Philip Miller published the first edition of his 'Gardener's Dictionary,' no considerable number of the hardy plants now most valued for their beauty had found their way into gardens. We did not even possess the rhododendron and azalea of Armenia, the parents of the most striking of all early flowers; and neither fuchsias nor china roses had been heard of. A general taste, however, for ornamental gardening had sprung up, and the vegetation of distant countries was beginning to attract attention. Travellers sent home seeds to their friends, and merchants foreign plants as precious gifts. The great body of gardeners was ceasing to consist of mere labourers. About the middle of the 18th century the Botanic Garden, at Kew, was formed and conservatories built in it by Sir William Chambers. Hither flowed all the acquisitions of the day, and herein was collected all that was most rare in the eyes of botanists. The governments of the day aided it by defraying the expense of collectors of plants in foreign countries. Experienced men were sent specially to China, to Ceylon, to Australia, to Brazil, and voyages of discovery were accompanied by competent gardeners, whose duty it was to forward everything to Kew. With such support the place acquired great celebrity, enormous materials were deposited there, and for a century it has been regarded as the richest garden in the world. The example thus set by royalty found followers in every

direction; public taste was so directed towards ornamental gardening that, by the beginning of the present century, a well-furnished pleasure-ground became as indispensable an article of luxury as a drawing-room, and what was called a "collection of greenhouse plants" was to be found attached to every village mansion. Unfortunately, however, skill in cultivating plants by no means accompanied ardour in collecting them. In the words of a modern writer on this subject, "vegetable physiology had only just begun to be applied to practice; what was good in cultivation did not extend beyond the fruit and kitchen garden, which was scantily supplied with varieties scarcely now remembered, except in the case of a few fruits and esculents little susceptible of change. Flower-gardens, shrubberies and plantations, contained little that had not been in them for a century and more." In reality, the hardy unprotected garden had been as little cared for as the greenhouse, and its exotic contents alone had been objects of solicitude. It was to remedy this unsatisfactory state of things that the Horticultural Society was founded, in the year 1804, in imitation of associations for the improvement of domestic animals and agriculture, which had already proved successful.

Mr. Thomas Andrew Knight, a Herefordshire country gentleman, had already become known as a distinguished vegetable physiologist, in consequence of many original communications to the Royal Society.[1]

[1] [Knight and the founding of the Horticultural Society. It is quite surprising how inaccurate Lindley's account is of the origins of the Society for which he worked. The original idea had been proposed by John Wedgwood, and Knight had not been at the first meeting; as he was engaged in a dispute with one of the founders, William Forsyth, whom he had effectively accused of fraud, he would have sat out the inception of the Society had Joseph Banks not enrolled him as a member. But Forsyth died within a few months of the founding, and Banks brought Knight in to draft the Society's objects. Wedgwood, the true founder of the Society, resigned in 1809. It would appear that Knight and/or his supporters effectively wrote Wedgwood out of the Society's history, as far as Lindley's generation was concerned.

Two years after Lindley's article appeared, and a year after Lindley himself had retired, Andrew Murray published *The Book of the Royal Horticultural Society*, and restored Wedgwood to his place in the Society's history ("Mr. John Wedgwood at whose suggestion it appears that the meeting was called" – Murray, 1863: 9). A good part of the discussion of garden history in the previous pages seems to have been based on Lindley's article, right down to the choice of the same quotation from Didymus Mountaine. BE.]

RHS, LINDLEY LIBRARY

Fig. 9. **Photograph of the RHS garden in Kensington, from Andrew Murray, *The Book of the Royal Horticultural Society* (1863).**

His favourite science had grown out of his love for natural history, and especially for those branches of gardening which related to fruit-trees and esculent vegetables. He lived in a perry and cider country, where he found the produce diminishing yearly from neglect and the unskilful management of orchard-trees. This seems to have led him to attempt the creation of a Society whose sole objects should be the improvement of Horticulture in all its branches. Sir Joseph Banks heartily approved of the plan, and a few other men of station or science having joined them, the foundation of the Society was laid. In an address delivered before the new Society in 1805, Mr. Knight, after pointing out the unsatisfactory condition of Horticulture in England, used these prophetic words: – "The establishment of a national establishment for the improvement of Horticulture has long been wanted; and if such an institution meet with a degree of support proportionate to the importance of its object, – if it proceed with cautious circumspection to publish well-ascertained facts only, to detect the errors of ignorance and to expose the misrepresentations of fraud, the advantages which the public may ultimately derive from the establishment will probably exceed the most sanguine hopes of its founders." The Society has met with great

support; it has published facts, detected ignorance and exposed fraud with a degree of success of which the world is little aware.

The great wars in which Europe was then unhappily involved prevented the new Association making progress; and it was not till their termination in 1815 that its importance was much appreciated. It then began rapidly to win supporters; its *Transactions* contained admirable papers; its meetings in London, although confined to a room, became attractive, and by the year 1822 its income had nearly reached 8,000*l.* Great numbers of fruit-trees of every kind had been gathered together; valuable seeds and cuttings had been distributed; and many beautiful plants had begun to arrive, chiefly from China, where the late Mr. Reeves procured everything that reached the markets of Macao. These and other importations had indeed become so numerous that a garden of considerable extent was felt to be necessary; and, in 1822, the ground at Chiswick, long the scene of open-air meetings unrivalled for their attractiveness, was hired and laid out. Naturalists in search of plants were despatched in all directions; and, in a few years, one of the most extensive collections of ornamental and useful plants that Europe has known was brought together, for the purpose of being distributed wherever they would be valued. For many years, the progress of the society was uninterrupted; science was made to influence practical gardening effectually; public exhibitions created a spirit of emulation among cultivators, who endeavoured to excel each other in the beauty of the articles they produced; the final result of which has been to place the English indisputably at the head of all horticultural operations. Nor was the useful neglected for the ornamental. Thousands of old varieties of fruit-trees and esculents were examined and re-examined till experience demonstrated their qualities; after which the worthless were rejected, and the good alone preserved. All new fruits or vegetables were tested, and, if meritorious, distributed. Every man was thus encouraged by honours and more substantial rewards, in the shape of valuable medals, to send his productions to Chiswick. It appears from the official Reports of the Society that, between 1830 and 1855, nearly 200,000 plants, above a million packets of seeds, and 100,000 packets of useful cuttings were dispersed gratuitously. At the same time, about 20,000*l.* was expended in pecuniary rewards to deserving gardeners.

In course of time, however, the attractions of Chiswick began to wane, and its power of doing good to diminish. The establishment of railways caused a five miles drive into the country to be distasteful to the multitude;

rival establishments, more favourably situate, arose; continual bad weather rendered the meetings *al fresco* unpopular, and it had become necessary to consider seriously the expediency of continuing the maintenance of the establishment at Chiswick, when an opportunity occurred of acquiring ground for the New Garden in South Kensington, which is now about to be opened. Here it is proposed to collect and exhibit all that is most interesting in the gardening world, whether the result of horticultural skill or of artistic taste. It cannot be a place for continuous cultivation on an extensive scale; but it will be admirably adapted to displaying whatever is most worthy of notice when produced elsewhere, in which the Chiswick garden will afford important aid, independently of the contributions of gardeners and nurserymen. The long Arcades will secure visitors from the risk of bad weather; the Conservatory, which is never to be heated excessively, will afford a pleasant place of resort to the lovers of flowers, and the beautiful grounds promise to become the most charming promenade in the west of the metropolis.

Lindley's Lectures on Botany, 1831

Brent Elliott
c/o The RHS Lindley Library, The Royal Horticultural Society, London

At their meeting of 26 November 1830, the Council of the Horticultural Society resolved:

> That the Council consider it expedient that a course of 3 lectures on Botany applied to Horticulture be delivered in the course of next spring to the Fellows of the Society, one in April and two in May next and that the Secretary be authorized to make such arrangements as may be necessary for the purpose.

Nothing more was said in the minutes until 11 March 1831, when the following items appeared:

> Mr. Lindley having requested permission of the Council to have specimens from the Garden for his Lectures this season, his wishes were ordered to be complied with[.]
>
> Resolved that the Lectures on Botany applied to Horticulture be delivered in the Meeting Room of the Society on the following Wednesdays viz. May 4th and 18th and June 1st at 3 o'clock in the afternoon – That 150 tickets for Ladies be issued for each lecture and that Fellows of the Society desirous of procuring them be requested to apply for them in writing to the Council, that all Fellows of the Society have a right to attend without tickets, & that the arrangements to be announced verbally and in writing at the Meetings of the Society and printed on the backs of the Cards of the days of meeting.

Lindley's lectures were obviously an important step in his career with the Society. He had published his *Outline of the First Principles of Botany* in June 1830, and was probably already working on his *Introduction to Botany,* the first edition of which would be published in 1832. The instruction to give the lectures was in effect the first recognition in Council minutes of his increasing stature as a botanist.

Lindley's lectures were never printed, so they do not appear in Allford's *Bibliography*. But a report on the lectures was published in the *Athenaeum*,

so we at least know the range of content covered in each lecture. The report was published in three instalments, one for each lecture, in the issues of 7 and 21 May, and 11 June, 1831. Here follows the text as given in the *Athenaeum*.

7 May 1831, p. 299 [report on meeting of 3 May 1831]

Mr. Lindley having kindly consented, at the request of the Council of the Horticultural Society, to deliver three lectures on Botany, as it applies to horticulture, commenced on Wednesday afternoon in the Society's meeting room in Regent Street. The justly-acquired popularity which Mr. Lindley has attained in his works on the subject – the interest which attaches to his lectures at the London University, and the increasing number of votaries to the study of botany, under the Jussieuan banners, drew together a large audience. The three organic components – cellular tissue, vascular tissue, and fibre – were exemplified by drawings from highly-magnified subjects; the forms appertaining to each in their varied combinations, and the extreme minuteness of matter, were explained at considerable length. Some idea of the latter may be formed from the statement, that 5100 cells or vessels occupied a space not greater than half a cubic line.

The readiest specimens of cellular tissue may be seen in the flowers of plants, in the substance known under the name of rice-paper, which is itself the pith of a Chinese plant, belonging to the mallow tribe, and is much used in the manufacture of the best artificial flowers; and in the orange, all the pulpy parts of which are one mass of it. That most remarkable portion of the vascular tissue, the spiral vessels, was fully expatiated on; as was also the use of tissue, in conveying fluids, although destitute of pores, – the great rapidity of its production, and its enormous expansive force.

Mr. Lindley then proceeded to describe the powers of absorption of the fibres and points of the roots – their wonderful capabilities of conveying nutriment – and the different tissues of which they are composed; – the great evaporation from the leaf, especially in deciduous plants through its cellular cuticle, to the extent, in some instances, of seventeen times as much as the human body, and in extremely dry weather much more; and in the case of the sun-flower, according to Hales, to the amount of 1 lb. 4 ox. per day; – the ascent of the nutriment by the alburnum – its passage into the leaf and return by the medullary rays to the heart

wood; – the absorption of oxygen by the leaves during the night, thereby rendering fruit more palatable in the morning than in the evening, and its expulsion of it by day; – the dependence of vegetables on light, and; – the chemical action of the atmosphere for the maintenance of their natural colours and qualities; the superiority of the melon, by the great exposure of its leaves; – the abundance in the produce even of the potato, when not suffered to choke itself; and the poisonous qualities of the celery negatived by the modes adopted for its cultivation; – the advantage of iron over wooden conservatories; and finally, the notice of Professor Schultz's observations, at Berlin, on the circulation of the fluids in plants, which is manifested to a great degree in the Ficus Elastica, when subjected to microscopic examination, by the transmission of the reflected solar rays. The demonstrations and illustrations were so clear and descriptive, and treated in so familiar a style, that we look forward with pleasure to the subject being resumed on the 18th instant.

21 May 1831, p. 330 [report on meeting of 18 May 1831]

The second lecture on Botany was given this day to a still more numerous attendance than the last, and as the former one was confined to the leaves and general texture of the vegetable kingdom, this continued the subject by treating principally on the functions of the blossom, and on the flowers of plants. The latter, being with all their beauty only modifications of the leaves, furnished a striking example of the curious analogy which one part of a plant bears to another, and the different forms under which he same parts are presented to the eye. The anthers, with the vivifying influence of the pollen, were described in detail; as were the reticulated, spherical, triangular, oval, and cylindrical appearances of the latter organ. The fertilizing power of a grain of pollen was accounted for by its discharging, when in contact with the stigma, bodies possessing what appears to be spontaneous motion.

Mr. Lindley dwelt at some length on hybrid plants, and on the beneficial and pleasing results likely to attend the judicious crossing of one variety with another, considering the advantages that have already arisen, notwithstanding the absence of any exact notions of the manner in which the influence of the pollen is exercised. The beautiful azaleas, raised by Lord Carnarvon, the noisette, boursault, and other hybrid China roses, the rosa ruga, so celebrated for its fragrance, the hardy American rhododendron catawbiense, fertilized by the tender East Indian R. arboreum, giving rise to

an extremely fine hardy variety; and the English oak by being crossed with the evergreen, producing a species with the qualities of both parents, as may be seen in the Society's garden, were all brought forward as evidences in support of the argument, not to say anything of the products in the orchard by this proceeding.

The processes of ringing fruit trees, and of bending trees downwards, causing a greater quantity of blossom by the detention and consequent accumulation of sap – the cause of excessively luxuriant branches not producing flowers – the modes of ensuring a production of blossoms in the most perfect state, and the limits within which variations in the colours of the corolla are supposed to be confined, were brought successively into notice, and concluded the lecture, – which will be succeeded by one on Fruit on the 1st of June.

11 June 1831, p. 380 [report of meeting on 1 June 1831]

The lecture on fruit, which was announced as terminating the course, was given this day, when all the phenomena were set forth that attend and are consequent on the conversion of the pistillum to maturity. The entire dependence of fruit upon all that influences the leaves, and upon the full and uninterrupted action of those appendages – the improvement by domestication of the wild-fruits – the numerous methods adopted in the important processes of budding, grafting, and inarching, their several operations, and the necessity of the medullary rays of both stock and scion developing equally, formed the most prominent features of this division of the subject. – A plentiful supply of very fine models of fruit, supplied the place of that which was wanting in reality, and, as works of art, gained almost as much admiration as those of nature, which adorned the present and previous meetings.

Reviews of Lindley in the *Athenaeum*

Brent Elliott
c/o The RHS Lindley Library, The Royal Horticultural Society, London

Lindley's works consistently received favourable reviews in the *Athenaeum*, beginning in 1830 when his *Outline of the First Principles of Botany* was described as "one of the best-compiled elementary works we have seen. Its excellence is condensation and connexion. It is not written for idlers..." Was this merely an instance of what Leslie Marchand referred to when he said that the editors were "given to panegyrical kindness when handling the work of their friends" (Marchand, 1941: 78)? Probably not, since Lindley had not yet, as far as I can trace, written a review for the *Athenaeum*; perhaps it was on the strength of this review that Lindley was asked to contribute?

At any rate, Lindley's works received favourable reviews in the *Athenaeum* on a regular basis thereafter. Here follows a list of these reviews, with some relevant extracts.

1830 *Outline of the First Principles of Botany*. 10 July 1830, p. 425; anonymous – this review was immediately preceded by a review of Blume's *Flora Javae*, by Smith; but Smith's name was not appended to the Lindley review.

1833 *Nixus Plantarum*. 5 October 1833, pp. 664–65; anonymous. "There is much good sense and a proportion of indifferent Latin in this little pamphlet. Why has Professor Lindley reverted to the old and exploded custom of clothing his ideas in one of the most confined languages he could select – a language which, so far from affording facility of expression, cannot supply more than *one* out of the five names by which he distinguishes his primary classes? If he will have a dead language, let him for the future write in Greek."

1834 *Botanical Register*, volume 6. 5 April 1834, p. 253; review by P.B. Lord. "This series, placed under the superintendence of Professor Lindley, comes forth with increased splendour of illustration, and increased accuracy of description."

1834 *Ladies' Botany*. 6 September 1834, pp. 651–52; review by P.B. Lord.

1839 *School Botany*. 6 July 1839, p. 507; anonymous.

1840 *Theory of Horticulture*. 21 March 1840, pp. 229–30; review by Sir Charles Morgan. "Dr. Lindley's delightful volume … will yield not only instruction, but endless amusement"; and after extensive quotations on watering, vitality of seeds, etc., the reviewer says, "We must conclude, which we do with regret".

1842 *Elements of Botany*. 28 May 1842, p. 477; review by Sir Charles Morgan. "… between the skill of the author, and that of the engraver, it is scarcely possible to present elementary notices on a simpler and more available plan. One consequence of this is, the impossibility of further analysis. Our readers must therefore rest contented with a reference to the work itself."

1846 *The Vegetable Kingdom*. 6 June 1846, pp. 573–74; review by Edwin Lankester.

1849 *Medicinal and Economical Botany*, 6th edition. 1 December 1849, p. 1207; review by Edwin Lankester. "It would have been impossible to give woodcuts of all the species mentioned consistently with the very low price of the work; but when we say that it is illustrated by upwards of three hundred diagrams and woodcuts, it will be at once seen that the book is marvellously cheap at the ordinary price of an octavo volume without engravings at all…This volume lays the botanical student under another obligation to Dr. Lindley; who has done more to make botany a popular and practical science than any previous or contemporary botanist."

1855 *Theory and Practice of Horticulture* [revised edition of *Theory of Horticulture*]. 15 December 1855, pp. 1460–61.

The first identified reviewer, in 1834, was Perceval Barton Lord (1808–1840), a surgeon to the East India Company. He reviewed medical works for the *Athenaeum* for some years, but discontinued this work to travel to Afghanistan as part of the diplomatic team in Kabul, where he recruited and armed those Afghans who were prepared to support the local warlord favoured by the British, and was killed in battle at Peshawar. The second reviewer was Sir Charles Morgan (1760–1846), second Baronet Morgan of Tredegar, an industrial and agricultural reformer. The third reviewer was Edwin Lankester (1814–1874), a former pupil of Lindley's at University College; in 1845, Lindley named *Lankesteria parviflora* in his honour. Lankester was the Secretary of the Botanical Section of the British Association for the Advancement of Science from 1839 to 1864, and was

therefore probably the reporter for the *Athenaeum's* coverage of that section. In his later career, he was the Coroner and then the first Medical Officer of Health for the City of Westminster, and Professor of Natural History at New College London.

The reviews of Lindley and the progress of natural classification

Since one of the major themes of Lindley's career was his fight against the continued dominance of the Linnaean system of classification in English education, and his attempt to work out a natural system of classification that would take into account all the parts of the plant, not merely the numbering of its floral parts, it is interesting to look at the way in which the *Athenaeum* reviewers regarded his efforts. All those who dealt with his books on the subject were critics of the Linnaean system, and supporters of the movement for natural classification; they did not always agree on the effectiveness of Lindley's alternatives.

Let us start with the anonymous reviewer of the *Nixus Plantarum* in 1833:

> The systems of Linnæus and Jussieu were notoriously inadequate to the present state of botanical science. They were overwhelmed beneath the quantity of new orders discovered since their institution, and which obstinately refused to bend to their rules. Partial emendations were attempted by De Candolle, Agardh, Reichenbach, Schultz, some of whom made matters a little better – others, as Professor Lindley thinks, a little worse.

He then complained that "The present pamphlet contains little more than the author's views in a tabular form... we feel the want of explanatory matter", while grumbling about Lindley's terminology: "The minor divisions are what the Professor denominates *Nixus* Plantarum, a term, we confess ourselves totally unable to translate".

Now we jump ahead a year, to Lord's review of *Ladies' Botany*:

> We have long lamented the insufficiency of the Linnæan system of Botany to give more than a verbal acquaintance with the vegetable kingdom; yet, from its great apparent simplicity, we almost despaired of seeing it supplanted by a more rational and scientific mode of instruction...

> We think that Professor Lindley has fully established his point, that the natural system is not only better, but for all practical purposes actually easier than the other. One obstacle to its universal adoption alone seemed to remain – the want of a popular Introduction to its study; and this he has completely removed by his present volume. It is accurate in its science, graceful in its style, and familiar in its language…

The anonymous review of *School Botany* in 1839 is interesting mainly for showing that the University of London was now swinging officially behind natural classification:

> The Council of the London University, having wisely decided that all students, two years previously to proceeding to their examination for their first degree, shall be examined, among other subjects, in the characters and differences of the principal natural classes and orders of plants belonging to the Flora of Europe, in the botanical classification of De Candolle; this little work has been written, that schoolmasters may know what and how much to teach, in order that they may neither treat the subject too superficially, nor consume more of the pupil's time in reference to it than is necessary. It must be manifest, that under these circumstances such a work was wanted, and it appears to be most judiciously compiled: the illustrative subjects are generally common and within reach, and the vulgar names are added.

Despite this, the Linnaean system went on being taught, and nearly twenty years later Henfrey's *Elementary Course of Botany* still gave the details of the Linnaean classes, though acknowledging that "the Linnean System is seldom had recourse to, except as a means of furnishing an Artificial Key to the genera of a limited region" (Henfrey, 1857: 199).

This brings us to Lankester's review of *The Vegetable Kingdom*, which is valuable not only as a discussion of natural classification but as a review of this aspect of Lindley's career to date.

Review by Edwin Lankester, of *The Vegetable Kingdom*
Athenaeum, 6 June 1846, pp. 573–4

Whatever difference of opinion may exist amongst his contemporaries with regard to the position which Dr. Lindley ought to have conceded

to him as a botanist, there can be no doubt that he has done for the literature of botany in this country more than perhaps was ever done by any previous writer. During the last twenty years he has produced a series of works, any one of which would have served to have constituted the reputation of an ordinary man. It is the astonishing facility with which he expresses himself, and the iron power which he has been able to throw into the necessary labour to be done, that have enabled him to occupy successfully every department of botanical literature. He has, in fact, enjoyed almost a monopoly in the writing of botanical works; and this it is which has exposed him to the carpings of the envious and the criticisms of the ignorant. It is vain, however, to abuse the work of an author whose only answer is more work; or to criticize the labours of a man who labours with the steam power of twenty: – above all, of a man who freely criticizes his own productions, and allows that what was written twenty years ago is not to be the rule of to-day.

But Dr. Lindley is not a mere writer of botanical books. There have been few men, if any, who, in the pursuit of a science, have cultivated every department and every relation which that science can sustain, so successfully. He commenced his career in this country, when botany could hardly be said to be cultivated as a science; when the collecting of strange plants, and sticking them on white pieces of paper with a hard name attached to them, were all that was considered necessary to make a man a botanist. The Linnean Society, it is true, had been founded; but, abiding by the letter of its patron name, rather than the spirit of the man, it confounded the means of the study of botany with its end, and regarded the ascertaining the number of stamens and styles in a plant as the climax of botanical observation. Robert Brown had also lived and observed, – but the facts and principles of that greatest of botanists were regarded only as ingenious theories. There was little knowledge of the intimate structure, and less of the functions, of plants; and even that little was not applied to any systematic elucidation of the relations that exist between the various members of the vegetable kingdom. It was at this period that Dr. Lindley commenced observing and writing. His reflective mind early detected the insufficiency – not to say absurdity – of the artificial system, as used by the followers of Linnæus in this country; and saw clearly that the true object of botany was only to be obtained by studying the means of that method of studying plants, which had first been pursued by his

own great countryman, Ray, successfully developed by Adanson and Jussieu on the continent, and rendered so much more philosophical and accurate by the profound genius of Robert Brown. His first efforts in observation were directed to the study of the relations of plants; and ever since, his works have had for their object the correct estimate of the structure and functions of the vegetable kingdom with a view to their scientific arrangement. We would not here institute a comparison between his labours and those of Brown. They have been of different orders, and in different fields: but of this we are convinced, that Brown has found in Dr. Lindley an ardent disciple, and one who has done more to extend his fame and apply his principles of classification than any other European writer.

Of the numerous works produced by Dr. Lindley, on physiological, structural, descriptive, and systematic botany, 'The Vegetable Kingdom' may be regarded as the flower and fruit. The former works were the branches, leaves, stipules, and bracts; which, by the morphological process of more extended observation and maturer thought, were to be metamorphosed into the flower of the present goodly volume. This work embraces a general view of the structure, classification, and uses of plants; – and the whole is arranged according to the natural system. This is not, however, the first comprehensive work of the author arranged according to the natural system. One of the first complete books in our language on this subject was his 'Introduction to the Natural System of Botany.' This was followed by 'The Natural System of Botany,' and a small work entitled 'Nixus Plantarum;' and in all of these he developed views more or less peculiar to himself. By a reference to those works, it will be found that the present arrangement differs materially from that in his former books. This will, undoubtedly, be urged by many not only as an objection to the author's views on the ground of unsettledness, but, perhaps, amongst the remnant of Linnean systematists left in this country, as an objection to the natural system itself. But such objectors certainly cannot comprehend the object of a natural system, – which is not "a system of nature," as some fanciful theorists suppose, but an attempt to arrange those objects in nature together which are most like each other, and to separate those which are most unlike. It is, then, in the very nature of increasing knowledge to disturb those relations which exist, and to discover others which have not been previously suspected. The man who believes his system to be the only true one – alike in religion

and science – resists the progress of truth, arrests the development of his own mind, and, according to his influence, throws a stumbling-block in the way of others. Just in the same way as every observation on the heavenly bodies influences the calculations of the astronomer, so does every observation on the tissues of plants, the discovery of every new form, tend to modify the views of the botanist. In the change which a botanist feels compelled to make in the subordinate groups of his system, he interferes not with the fundamental principles on which that system has been constructed; but makes it in accordance and in obedience to those principles, – so that what seems needless change to the ignorant, is only the result of necessity on the part of the instructed. That Dr. Lindley has perfected the natural system we do not think: – that he has made many improvements and added thereby greatly to our knowledge of plants, and consequently of the science of botany, we think no one would venture to deny.

The present work is much more extensive than the former by the same author, and is the result of an amount of labour which few but the author could command. The general plan is similar to that of "The Natural System;" and its object is to give a general outline of the structure and uses of plants through the relation of a natural system. A new feature of the work is an Introduction, – in which the general principles of classification in botany are laid down, and a survey of the various natural systems from the time of Ray to the present is given. Dr. Lindley justly vindicates the claim of Ray to be the first philosophical expounder of a natural system of plants: at the same time, we think the author would have added to the value of this part of his work had he given an outline of the systems previous to the time of Ray; – those of his contemporaries, as of Tournefort and Rivinus, and others previous to Jussieu and De Candolle, as that of Adanson. From this part of the work, we learn that the author's system of arrangement has undergone several changes previous to its assuming its present form. All these changes may be regarded as a departure from the system of De Candolle; from which they have differed, – first in the constitution of groups of plants of a higher value than Orders, and inferior to Classes, – and second, in the forming a larger number of natural classes. Of the practical value of such combinations of Dr. Lindley's groups or sub-classes, and alliances standing between orders and classes, there can be little doubt; and the only objection that can be urged against them is their frequently artificial characters – so that

violence is done to the definition of the characters of the lower groups for the sake of arrangement. Such violence, however, will always depend on the more or less artificial character of the higher groups. As an instance, we may give De Candolle's divisions of the Exogens; in which the grater or less union and developement [*sic*] of the corolla was made the basis of three sub-classes, according as plants had polypetalous, monopetalous, or incomplete flowers. Now this was highly artificial; brought together orders very differently constituted, and separated others which a strongly resembled each other. In the present work, Dr. Lindley has got rid of these distinctions; and polypetalous, monopetalous, and incomplete orders mingle together in his alliances.

From the time of Ray, three great classes, or divisions, of the vegetable kingdom have been recognized by almost all the advocates of a natural system: – these are Exogens, Endogens, and Acrogens. From their agreeing in a number of other particulars, besides the growth of the stem, they have been called by other names; but these three classes have always been maintained. They have been stated to be truly *natural* combinations, – and on that account necessary as the basis of any natural system. This, however, we would point out as an error: – there is no system or arrangement in nature, as we regard systems and arrangements. A system, with man, is the arrangement of so many words so as to express certain facts in nature, in accordance with certain fundamental ideas which he possesses of the likeness or unlikeness of things in nature, – not the expression of any arrangement in the mind of Divinity, of which we have not, and cannot by possibility have, any rational conception. Such classes, then, are more or less *artificial*, after all; and this is seen in the fact, that the characters of these classes will not apply to all plants. Since the establishment of these classes, there have not been wanting diligent observers who have pointed out many plants that could not be said properly to belong to any one of the three great ones. Thus arose minor classes: and Gymnosperms and Rhizanths were separated from the rest. These minor classes were found to strengthen the larger ones, – just in the same way as the forming a small natural order will strengthen two or more large allied ones. Relying on this fact, Dr. Lindley has added a small natural class with the name dictyogens; and divided the old class Acrogens into two, – one of which is called Thallogens. The following are the author's characters of the classes of plants: –

Asexual, or Flowerless Plants

Stems and leaves undistinguishable.	I. THALLOGENS.
Stems and leaves distinguishable.	II. ACROGENS.

Sexual, or Flowering Plants.

Fructification from a thallus.	III. RHIZOGENS.
Fructification springing from a stem.	
Wood of stem youngest in centre. Cotyledon single.	
Leaves parallel-veined. Permanent wood of stem confused.	IV. ENDOGENS.
Leaves net-veined. Deciduous wood, with a central pith.	V. DICTYOGENS.
Wood of stem youngest at circumference; always concentric. Cotyledons, 2 or more.	
Seeds quite naked.	VI. GYMNOGENS.
Seeds inclosed in seed-vessels.	VII. EXOGENS.

We think, if the principle be admitted of cutting off small sections of large clases, for the purpose of giving them more systematic value, that little or no objection can be raised against these smaller classes of Dr. Lindley. There is, however, a position of objection which – at any rate with regard to one of them, the Rhizogens – has been taken by Brown and Griffiths, and some of our ablest botanists – namely that their structure can be easily explained on the supposition that they are reduced forms or Exogens or Endogens. We think this an unsound position; because it assumes what has first to be demonstrated, – that the classes of Exogens and Endogens constitute the best divisions of the vegetable kingdom for carrying out the objects of a natural system. On the same grounds on which the Rhizogens or Rhizanths have been made lower forms of Exogens and Endogens, they might be made higher forms of Acrogens and Thallogens; or Acrogens and Endogens be regarded as reduced forms of Exogens. The question is, whether, for the purposes of classification, the Rhizanths are not best placed in a separate class? – and we think, with Dr. Lindley, that, in the present state of our knowledge, this is at once the most philosophical and practical method of arrangement.

In the present work, Dr. Lindley has ventured on an English nomenclature of the natural order. Whatever may be the difference of opinion as to the English terms adopted in this work, every one must feel that such a system

is desirable. Such words as Starworts and Crowberries are more easily used and remembered by the great mass than Callitrichaceæ and Empetraceæ. Some hesitation might, however, be felt in using such words as Marcgraviads, Kadsurads, Humiriads, and the like, for Marcgracaviaceæ [*sic*], Casuaraceæ, and Humiriaceæ. The attempt, however, is before the public; – and whether all Dr. Lindley's names are adopted or not, its convenience will, we make no doubt, lead to the more general use of English names, and to the smoothing down some of the asperities which are necessarily connected with a first effort. We cannot at all sympathize with those who think these are useless innovations. Whatever tends to popularize a science, and make it more familiar with the mass of men, must not only increase the number of observers in that science, but tend to the legitimate end of all science – the elevation and happiness of mankind.

There are few departments of Natural History which can be successfully explained without the aid of drawings or diagrams, – and none that require it more profusely than botany; and Dr. Lindley has done a great service to the science in venturing so copiously to illustrate this great work. Every natural order is furnished with a drawing, illustrative of its form and structure; so that if the description could be only imperfectly understood, it is at once explained by the plate. This kind of knowledge could at one time only be obtained through the means of expensive monographs, – and these often deposited in still more costly Transactions; but now, for a few shillings, the student of botany may have that which before would have cost him double the number of pounds. We must also award our praise to a copious and accurate index, – to the valuable artificial analysis of the orders, – and to the practically useful diagnosis of the orders; which will all be found of the greatest value in the study of plants.

The publication of this work must form an era in the botanical science of this country: for, whether we regard the importance of its scientific details, its practical nature – embracing, as it does, a survey of the uses of the animal kingdom to man – or the lowness of its price, it cannot fail to exercise an important influence on the study of botany.

Obituary for Lindley

Berthold Seemann
From the Athenaeum[1]

Dr. Lindley

Science has just sustained a heavy loss by the death of Dr. John Lindley, one of the most hard-working and celebrated botanists England has ever produced. Dr. Lindley was born at Catton, Norfolk, in 1799, and at an early age turned his attention to the study of the Vegetable Kingdom. When he first entered scientific life, botany was just emancipating itself from the deadening influence of the artificial system, in this country upheld by a narrow-minded party. Whoever ventured to write or say anything against these sages was at once a marked man. The treatment which Dr. J.E. Gray received for daring to publish the first British Flora, arranged according to the Natural system, is no isolated case. Dr. Lindley's history, and that of several other men of genius, furnish additional examples. The ideas of which Dr. Lindley was a representative soon brought him into collision with Sir J.E. Smith; but there was something in him which triumphed over this as well as over every other attack, and enabled him effectually to overcome all the vexatious impediments thrown in his way. The opposition he met with put him on his mettle, made him one of the most powerful and ready writers of the day, and secured to him a niche of fame which his early opponents never attained. Dr. Lindley's rise in the estimation of his contemporaries was rapid, and for more than thirty years he was the centre to which botanists turned for advice and help, and around which botanical science in this country moved; Brown, his equal, or let us rather say superior, in intellectual grasp, being of too retiring a disposition to serve that purpose.

Dr. Lindley's external history is briefly told. He was for many years Secretary to, not to say the life and soul of, the Horticultural Society during its palmiest days, when botanic collectors such as Douglas and Hartweg were sent out to remote parts of the world, when Knight and Sabine published the results of their investigations, and new methods of cultivation were practically and successfully demonstrated at Chiswick. To his connexion with this body of enlightened men is owing his conception of

[1] 4 November 1865, p. 615.

his 'Theory of Horticulture,' a work which has done more to put gardening on its proper footing than any other, and which in this country went through several editions, and has been translated into many European languages by men of real eminence. This same connexion also led him to feel acutely the want of a good weekly gardening newspaper, such as Fred. Otto had established in Berlin some years previously, and the *Gardeners' Chronicle and Agricultural Gazette* was the result. Dr. Lindley became the editor of the paper, and held that office till the day of his death. It offered him a ready field for expressing his opinions, freely criticizing all that was unsound and shallow, and holding out that helping hand to rising talent so shamefully withheld from him on his first entry into scientific life. The *Botanical Register* offered another opportunity of advancing his favourite science, by figuring and describing the most remarkable new plants that came to this country. Many of our garden pets, the names of which have now become household words, such as Fuchsias, Verbenas, and Calceolarias, were first made known in the pages of that periodical. Dr. Lindley's particular favourites, however, were none of the plants just mentioned, but those most singular of all vegetable forms the Orchids; and it may be said that he brought them into fashion. For many years he laboured incessantly to describe their numerous representatives, and interpret their singular structure. It took him ten years to work out 'The Genera and Species of Orchidaceous Plants,' and another ten years to complete various memoirs on these plants, which he published under the name of 'Folia Orchidacea.'

The writings of Dr. Lindley form quite a library by themselves. There are amongst them both elementary books and works intended merely for leading men of science. His 'Fossil Flora of Great Britain' has endeared him to geologists, and his various works on gardening to horticulturists. Perhaps the most widely known of all his works is 'The Vegetable Kingdom,' which appeared in 1846, and gives a condensed account of the structure, geographical distribution and uses of plants, arranged according to the Natural system as understood by him. It was an amplification of his earlier attempts in the same direction, and has been found extremely useful. Notwithstanding that its general arrangement of the Natural Orders has never been followed by any botanist, it would be difficult to name a work which has more advanced the cause Dr. Lindley had so much at heart, than this book. When it first appeared, it was stereotyped, and the new editions are merely the old matter with some cancels and supplementary

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Fig. 10. **Carte-de-visite photographic portrait of Berthold Carl Seemann (1825–1871).**

pages. “I can do nothing more with it,” we heard him say a few years ago; “I am getting too old to be able to sit up half of the nights as I used to do formerly; and I must leave it to younger men to finish what I have begun.” He was right; he WAS no longer able to sit up half the night deeply engaged in study. As it was, he had worked too hard, and overstrained his brain. His memory, which had always been most retentive, began to fail; and he suddenly found that he must give up all mental labour, at least for a time. There was a slight improvement after he had enjoyed some months of undisturbed rest, but it became soon painfully evident to all that the strength of this mental giant was broken, that Lindley had laid down his powerful pen, never to take it up again. He had to give up his connexion with the Horticultural Society altogether, and resign the Professorship of Botany at University College, which he had filled for many years. He died of apoplexy on Wednesday, the 1st inst., at his residence on Acton Green, deeply regretted by a large circle of friends.

Lindley was a member of most scientific societies in all parts of the world, and his name is held dear wherever science is cultivated and true genius appreciated.

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Occasional Papers from the RHS Lindley Library: future issues

Volume 14 will contain accounts of recent research on the collections of the RHS Lindley Library.