THE TYPIFICATION OF ROYLE'S RANUNCULACEAE

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ABSTRACT. An attempt is made to correlate the specimens of Ranunculaceae in the Royle Herbarium at Liverpool with Royle's own account in the *Illustrations of the Botany of the Himalayan Mountains and the Flora of Cashmere* (1833–40). Royle specimens from the Saharanpur Herbarium in Dehra Dun have also been examined and type specimens indicated where possible. Lectotypes of *Aconitum cordatum* Royle, *A. laeve* Royle and *Anemone discolor* Royle are designated.

INTRODUCTION

The main herbarium of John Forbes Royle, used in the preparation of his *Illustrations of the Botany of the Himalayan Mountains and the Flora of Cashmere* (2 vols, 1833–40) is housed in the City of Liverpool Museum (LIV) which is now part of Merseyside County Museums, but there are also Roylean specimens in the Saharanpur Herbarium in Dehra Dun (DD) and other herbaria. After Hooker & Thomson had seen and used this important herbarium in the writing of their *Flora Indica* it was lost until 1952 when it was rediscovered among the 'odds and ends' of a gift to the Liverpool City Museum (Stansfield in *Liverpool Bull.* 3:5, 1954). The collection is of particular importance because of the number of types it contains, and in order to identify those of the Ranunculaceae, both the Royle herbarium and Royle specimens from Dehra Dun have been examined. Most of the specimens have been identified but those not related to typification are not discussed.

Many new species of Ranunculaceae were described by Royle (1834) but in some cases the publication of the description is validly predated by figures accompanied by analyses published in 1833. Information on the dates may be found in "The Dates of Publication of Royle's Illustrations" by T. A. Sprague (*Kew Bull.* 1933:378–390, 1933) and in "Royle's Illustrations of the Botany of the Himalayan Mountains" by W. T. Stearn (*Journ. Arn. Arb.* 24:484–487, 1943). Stearn's paper corrects some of the dates given by Sprague and lists anew the dates of publication of the text and illustrations. By using these two papers one can establish the date of publication of any of Royle's new species without further research.

On page two of Vol. 1 Royle indicates the diverse nature of the material he examined, which included the Wallich herbarium (with Webb, Moorcroft and Gerard specimens), the Moorcroft collection (in BM), and collections made by Lt Maxwell in Kunawur, R. Inglis in Simla and other localities, and by native collectors in Cashmere. It is important to note that Royle says that the Wallich herbarium "has been constantly consulted". In taking up Wallichian names and validating them by description, Royle not only cited the Wallich Catalogue numbers but also in addition sometimes indicated collections in the Royle herbarium, and where these collections still exist they necessarily become syntypes together with the Wallich specimens. In such cases I have attempted to clarify the type position and it is hoped to check the types in the Wallich herbarium at Kew at some future date. It is as well

to note that many of the specimens in the Royle herbarium are of such poor quality as to be almost inadequate as types and in some cases different collections and species are currently attached to the same sheet. It is not always clear from the specimens who collected them and one can often only make deductions. Labelling and annotation is in general very poor and in any work dealing with the Royle Herbarium the valuable paper of Stansfield (*op. cit.*) should always be consulted as it provides a great deal of background information.

There seems no question that the collection at Liverpool represents the first set of the Royle herbarium. Hooker & Thomson in the Introductory Essay of *Flora Indica* (1:65, 1855) state "the original set of Dr Royle's collection remains in his own possession" and Mrs B. D. Greenwood (Assistant Keeper of Botany, Merseyside County Museums) informs me that the Report of the Liverpool Royal Institution for 1859–60 records that this herbarium was presented to the Institution by Mrs Royle (from whence it later passed to the City of Liverpool Museum). It is therefore fairly safe to assume that where type specimens have been found in the Royle herbarium, they can be regarded as holotypes. Nevertheless, there may be discrepancies between the supposed types and the information given by Royle, and in some cases, where type specimens have not been found at all, it may be necessary to find authentic specimens elsewhere. For instance, in the case of *Amphicome arguta* Royle (Bignoniaceae) there is no type specimen in the Royle herbarium but the holotype was located at the British Museum (Grierson, *Notes R.B.G. Edinb.* 23:318, 1961). I have seen some Royle specimens in the Kew herbarium which are indicated as types and I hope to examine them further in the future, but in most cases the only locality given is NW India. It is possible that some of these Kew specimens may have to be chosen as lectotypes.

In the main part of this paper I have tried to elucidate the type position and to give an opinion as to type status, but in some instances further work by specialists in particular genera will be necessary. Lectotypes have been designated only in *Aconitum laeve*, *A. cordatum* and *Anemone discolor*; in all other cases remarks are meant only to act as a guide to those who may want to take up Royle specimens as lectotypes. I hope this paper will provide a basis for other workers on Ranunculaceae and draw attention generally to some of the problems encountered in working with the Royle herbarium. Certainly all who are involved in Himalayan botany, particularly of the north-western area, should be aware of them.

In the "Synopsis of the Genera and Species of Ranunculaceae found in the Himalayan Mountains" Royle (*op. cit.*, pp. 51–57, 1834) numbers the genera and species separately and more or less consecutively. The numbers run from I/1 to XII/70 and then to XIV/71, XV/71 and XVII/72 (he omits XIII and XVI and repeats the specific no. 71). The following notes keep the same sequence so that they may be related to the Synopsis. All Roylean species now regarded as later synonyms are indicated; the remainder represent good species as far as is known.

I am grateful to the Director of the Merseyside County Museums and to the President of the Forest Research Institute and Colleges at Dehra Dun for the opportunity of seeing the specimens from their herbaria. My thanks are also due to Mrs B. D. Greenwood (Merseyside County Museums) for her help.

Clematis cordata Royle, Ill. 51 (1834). I/2. There is no sheet bearing the name *C. cordata*. There is one LIV sheet bearing two labels, one of which says "*Clematis subcordata* Rl.", the other "1/2 an 1/1, *C. subcordata* Rl. var. an altera species, Jumboo 1828". This sheet could be the type of *C. cordata* Royle. The species is not referred to by Hooker & Thomson so it seems apparent they did not see a specimen labelled *C. cordata*.

Clematis nutans Royle, Ill. 51 (1834). I/5. The probable type specimen (LIV) has been seen. It is labelled "1/7, *C. nutans* Rl." but the habitat as given by Royle in the Synopsis, "Suen range, and on the banks of the Giree", is not on the label. *C. nutans* Royle—non Crantz (1763)—is now known as *C. roylei* Rehder.

Clematis venosa Royle, Ill. 51 (1834). I/6. There is no specimen at LIV but I regard a specimen from DD as a type. It is labelled "1/4, *Clematis rugosa*, Simla" and below '*rugosa*' is written '*venosa*'. Royle cites "Simla, Nagkanda, R. Inglis, Esq.". This DD sheet has already been correctly identified as *C. connata* DC. It should probably be considered as a lectotype of *C. venosa*.

Clematis globosa Royle, Ill. 51 (1834). I/7. No specimen determined as *C. globosa* has been seen from LIV or DD, but there is a LIV specimen of *C. orientalis* L. labelled "*C. aquilegifolia*, Soongnum" which could possibly be the type of *C. globosa*; it agrees with the description "alabastris subglobosis". It resembles *C. orientalis* var. *latifolia* Hook. f. & Thoms. with which Hooker & Thomson equate *C. globosa*.

Clematis tenuifolia Royle Ill. 51 (1834). I/8. There is an unlabelled LIV specimen which matches the description of *C. tenuifolia* and could possibly be the type of that species. Hooker and Thomson equate the name with *C. orientalis* L. var. *acutifolia* Hook. f.

Thalictrum elegans [Wall. ex] Royle, Ill. 51 (1834). III/12. The syntypes of *T. elegans* are *Wall.* 4728, which is a collection by Robert Blinkworth from Kumaon, and the LIV specimen cited by Royle from Choor which I have seen. There is a syntype of the Blinkworth collection at Edinburgh (E–GL).

Thalictrum neurocarpum Royle, Ill. 51 (1834). III/14. A LIV specimen is labelled "*Thalictrum chelidonii* Wall? Choor" and above it in pencil "*neurocarpum*". It is probably type material of *T. neurocarpum* which is a synonym of *T. reniforme* Wall.

Thalictrum microphyllum Royle, Ill. 51 (1834). III/15. A LIV specimen labelled in Royle's hand "*T. microphyllum* Royle", from Kedarkanta, is probably the holotype. A DD specimen also labelled "*T. microphyllum*" in Royle's hand is an isotype. Handel-Mazzeti reduced this species to varietal rank as *T. alpinum* L. var. *microphyllum* (Royle) Hand.-Mazz.

Thalictrum marginatum Royle, Ill. 51 (1834). III/16. A LIV specimen labelled "*Thalictrum marginatum* Royle, Chango beyond Soongnum" is probably the holotype. Another DD specimen also from "Chungoo beyond Soongnum" numbered 1/21 is an isotype. *T. marginatum* is a synonym of *T. alpinum* L.

Thalictrum vaginatum Royle, Ill. 52 (1834). III/17. A LIV specimen labelled "1/13 & 1/20, *T. vaginatum* Rl., Rogee in Kr." (=Kunawur) is probably the holotype. *T. vaginatum* has been retained as a separate species but is sometimes regarded as a synonym of *T. foetidum* L.

Thalictrum maxwellii Royle, Ill. 52 (1834). III/18. A LIV specimen labelled "1/19, *Thalictrum maxwellii* Rl. from Rogee, Kunawur", has been seen. No specimen or locality is cited by Royle. This specimen is probably the type and I have identified it as *T. minus* L. subsp. *majus* (Crantz) Rouy & Fouc.

Thalictrum radiatum Royle, Ill. 52 (1834). III/19. A LIV specimen labelled "*Thalictrum radiatum* Rl., Mussooree, August in rains" is probably the holotype. A similarly labelled DD specimen numbered 1/15 is an isotype. *T. radiatum* is synonymous with *T. saniculiforme* DC. Part of Stansfield's remarks (*op. cit.*, p. 17) under *T. maxwellii* refer to *T. radiatum*.

Thalictrum pauciflorum Royle, Ill. 52 (1834). III/20. A LIV specimen from Kioonthul, Cashmere is probably the holotype.

Anemone wallichiana Royle, Ill. 52 (1834). IV/21. The type specimen from Chango in Kunawur has not been seen. Hooker & Thomson equate the species with *A. albana* Stev. There is a LIV specimen labelled "1/34 *Anemone wallichii* Rl. an *Anemone rivularis*" but I am sure this is not *A. wallichiana* Royle which is in fact a *Pulsatilla*.

Anemone discolor Royle, Ill. 52 (1834) & t. 11, f. 1 (Sept. 1833). IV/22. There was no analysis accompanying the illustration therefore 1834 is the date of valid publication of *A. discolor*. Royle stated, "I found it . . . on the top of Choor, Urukta and Kedarkanta". Written on the LIV sheet is "1/28, *A. ranunculifolia* Royle MSS, Choor", and above this "*A. discolor* Ill. Pl. 1, f. 15": it is in fact figured in t. 11, f. 1. This specimen is here designated as the lectotype of *A. discolor*, which is a synonym of *A. obtusiloba* D. Don.

Anemone villosa Royle, Ill. 52 (1834). IV/26. Royle cites "Lippa & Cheenee in Kunawur". There is a LIV sheet bearing two specimens and two labels. One label says "*Anemone pilosissima* Rl., Lippa in K"; '*pilosissima*' has been deleted and '*hirsuta*' substituted. The other label says "*A. tomentosa* Rl., Chenee in K", but '*tomentosa*' has been deleted and '*villosa*' substituted. One cannot say which label belongs to which specimen, but they are both syntypes of *A. villosa* which is a synonym of *A. polyanthes* D. Don. A DD specimen labelled "1/33, *Anemone tomentosa* Rl., Chenee, Kunawur" with '*villosa*' written beneath '*tomentosa*' is also a syntype of *A. villosa*.

Anemone tetrasepala Royle, Ill. 53 (1834). IV/27. A LIV specimen labelled "*Anemone tetrasepala* Rl., Jumboo, road to Cashmere, 1828" is probably the holotype.

Adonis inglesii Royle, Ill. 53 (1834). IV/28. There are four specimens on the same LIV sheet but the specimen of *A. inglesii* from Hango in Kunawur is clearly indicated. It is probably the holotype of *A. inglesii* which, however, is a synonym of *A. aestivalis* L.

Ranunculus glabellus D. Don in Royle, Ill. 53 (1834). V/30. A LIV specimen labelled "*Ranunculus lindleyanus* Rl., Salkur in Kunawur" may be a type specimen of *R. glabellus*—generally regarded as a synonym of *R. hirtellus* D. Don. *R. glabellus* was wrongly referred to as *R. glabratus* by Hooker and Thomson (*op. cit.*).

Ranunculus distans D. Don in Royle, Ill. 53 (1834). V/31. A LIV specimen labelled "1/51, *Ranunculus distans*, road to Cashmere" is probably the type of *R. distans*. It is synonymous with *R. laetus* [Wall. ex] Royle. Another specimen on the same sheet, labelled "*Ranunculus adpressus* Rl. Jaoning, Novr. 1829" may be the specimen referred to under *R. distans* by Royle as "at Joonug near Simla". It is a very poor specimen but could also be *R. laetus*.

Ranunculus laetus [Wall. ex] Royle, Ill. 53 (1834). V/32. Under *Wall.* 4702, Wallich cites: (a), Deyra Doon 1825; (b), Kumaon, R.B. (Robert Blinkworth); (c), ? Sirmore, G. Govan; and (d), var. *minor* Wall.—Kumaon, R.B. In his protologue Royle cites Wall. Cat. n. 4702 ex parte and adds "Hab. Mussooree, and everywhere in the Himalayas". There are three LIV sheets of *R. laetus*, including one from Mussooree, numbered 1/41. Royle does not indicate which part of *Wall.* 4702 he intends as typical *R. laetus*. In the Edinburgh herbarium (E–GL) there are duplicates of *Wall.* 4702 b & d and these are *R. laetus*. It is my opinion, therefore, that *Wall.* 4702 b & d, and the Royle specimen from Mussooree, can all be regarded as syntypes of *R. laetus*.

Ranunculus hirtellus D. Don in Royle, Ill. 53 (1834). V/33. There are three LIV specimens of *R. hirtellus* on one sheet. They relate to three labels reading "1/55, Deobun", "*R. biflorus* Rl., Kedarkanta" and "*R. hirtellus* Rl., Lippa in K". The three labels are attached on top of each other and cannot be allocated individually to the three specimens which must be regarded as syntypes, since Royle cites Deobun, Kedarkanta and Lippa in Kunawur in the protologue. There is another *Ranunculus* specimen in a folder attached to the sheet.

Ranunculus attenuatus D. Don in Royle, Ill. 53 (1834). V/34. The type specimen from "Lippa in Kunawur" has not been seen. Hooker & Thomson (*op. cit.*) regard it as a synonym of *R. hirtellus*.

Ranunculus nervosus D. Don in Royle, Ill. 53 (1834). V/35. On the same LIV sheet are four separate specimens and two labels, one saying "*Ranunculus gracilis* Rl., Lippa in Kr", the other "*Ranunculus nervosus* MSS, 1/42, Mussooree, June". Royle cites only "Hab. Mussooree". It is difficult to match the specimens with the labels but I suspect that the two tall specimens on the right-hand side of the sheet are the ones described and therefore form type material of *R. nervosus*, which is a synonym of *R. hirtellus*.

Ranunculus choorensis D. Don in Royle, Ill. 53 (1834). V/36. The lowermost specimen on a LIV sheet bearing three specimens is labelled "*Ranunculus choorensis*" with the localities "Choor, Urukta, Kedarkanta", the first and last of which are cited by Royle. This specimen is probably the type of *R. choorensis* which is a synonym of *R. hirtellus*.

Ranunculus vitifolius D. Don in Royle, Ill. 53 (1834). V/37. The two upper specimens on the LIV sheet mentioned above are labelled "*Ranunculus apiifolius* Rl." and are from Mussooree; they may represent type material of *R. vitifolius*. A DD sheet is labelled "1/29, *Ranunculus apifolius* Rl. Mussooree, July", but '*apifolius*' is deleted and '*vitifolius*' substituted. The latter specimen would seem well qualified to form a lectotype with the LIV specimen as an isotype. *R. vitifolius* is a synonym of *R. diffusus* DC.

Ranunculus mollis [Wall. ex] Royle, Ill. 53 (1834). V/38. The type is *Wallich* 4704 from Nepal. There are isotypes in Edinburgh (E–GL). *R. mollis* is a synonym of *R. diffusus* DC.

Ranunculus pimpinelloides D. Don in Royle, Ill. 53 (1834). V/41. There are two LIV specimens of this species mounted on the same sheet as another *Ranunculus* (see V/42). There are also three labels, none bearing the name *R. pimpinelloides*, attached together on the sheet. One says "*Ranunculus crassifolius* Rl., Soongnum", another "*Ficaria brunoniana* Rl., *Ranunculus polypetalus* Rl. Kedarkanta" (in the Synopsis Don gave the locality of *R. pimpinelloides* as Soongnum in Kedarkanta). For the third label see V/42. It seems likely that these two labels belong to the two specimens of *R. pimpinelloides* which are probably types. *R. pimpinelloides* is the basionym of *Callianthemum pimpinelloides* (D. Don) Hook. f. & Thoms.

Ranunculus membranaceus D. Don in Royle, Ill. 53 (1834). V/42. On the same LIV sheet as V/41, a third label bears the words "*Ranunculus membranaceus* Rl., base of petioles membran., Lippa in K". Hooker & Thomson placed *R. membranaceus* in synonymy under *R. pulchellus* C. A. Mey. var. *sericeus* Hook. f. & Thoms. The third specimen on the sheet is definitely not *R. membranaceus*, but is too poor for identification. I have not seen a specimen which could form type material of *R. membranaceus*.

Ranunculus polypetalus D. Don in Royle, Ill. 54 (1834), t. 11, f. 2 (1833)—non Raf. 1817 nec [Gill. ex] Hook. & Arn. *nom. nud.* (1832). V/46. There are two LIV specimens in folders, one bearing the inscription "1/48 *Ranunculus polypetalus*", the other "*Ranunculus minimus* MSS, Kedarkanta"; the specific name in the latter has been crossed out. In his Synopsis Royle stated that the species had been found only at Kedarkanta. The illustration does not really help to decide between the two specimens although the one from Kedarkanta is more complete. These specimens should be regarded as comprising type material. A DD specimen is labelled "1/49 *Ranunculus polypetalus* Rl.", and the sheet itself is annotated "*Oxygraphis polypetala* Hook. f. & Thoms.". This specimen should perhaps be selected as a lectotype of *O. polypetala*. *R. polypetalus* D. Don in Royle is a later homonym of *R. polypetalus* Raf.

Caltha govaniana [Wall. ex] Royle, Ill. 54 (1834). VI/47. The specimens cited by Wallich under *Wall.* 4710 are: (a) from Sirmore collected by Govan & Gerard and, (b) from Kumaon collected by Robert Blinkworth. The specimen

cited by Royle from Choor, Urukta, is in LIV. All three collections are syntypes of *C. govaniana*. Duplicates of *Wall.* 4710 a & b are in Edinburgh (E–GL).

Isopyrum microphyllum Royle, Ill. t. 11, f. 4a, b (Sept. 1833), 54 (1834). VIII/51. The type specimen as cited by Royle is a Wallich collection from Jumnotri, Buddrinath. There is no indication that the LIV specimen of *I. microphyllum* came from the Wallich collection. Royle clearly states that the illustration of *I. microphyllum* is from specimens in the East-Indian Herbarium (now in Kew). *I. microphyllum* is the basionym of *Paraquilegia microphylla* (Royle) Drumm. & Hutch.

Aquilegia pubiflora [Wall. ex] Royle, Ill. 55 (1834). X/53. The specimen cited by Wallich under *Wall.* 4714 is "Srinagar and (or at) Bhudrinath, Robert Blinkworth". Royle gives the distribution also as Mussooree & Choor, but as no specimens from these localities have been found in the Royle herbarium, it can be presumed that specimens under *Wall.* 4714 represent the only type material. There is an isotype at Edinburgh (E–GL).

Aquilegia pubiflora [Wall. ex] Royle var. **mussooriensis** Royle, Ill. 55 (1834). X/53. Royle does not cite any specimen, remarking only on the difference from *A. pubiflora* and its occurrence on the Mussooree range. There is a LIV specimen labelled "*Aquilegia mussooriensis* Rl. an *A. pubiflora* var.". This is probably the type specimen. There are also two DD sheets, one labelled "1/66 *Aquilegia humilis*, Mussooree, June", which is *A. pubiflora* var. *pubiflora*, and the other "1/65 *Aquilegia pubiflora*" and "1/66 *Aquilegia pubiflora* (Wall.), Mussooree". The second sheet has been annotated "*A. pubiflora* Wall. ex Royle var. *mussooriensis* Royle". These two DD sheets are probably not types. I am uncertain of the merit of varietal rank for var. *mussooriensis*, although Munz retains it in his work on "Aquilegia, The Cultivated and Wild Columbines" (*Gentes Herb.* 7:44, 1946).

Aquilegia moorcroftiana [Wall. ex] Royle, Ill. 55 (1834). X/54. The syntypes are *Wall.* 4713a. "Ex itinere ladaccensis, Moorcroft", and 4713b "Mons Choor, Royle". The specimen cited by Royle from Luddak and collected by Moorcroft is that cited by Wallich under 4713. Attached to a LIV specimen is the latin description appearing in Royle *Ill.* and this seems to establish the collection as a type although there is no indication of "Luddak" or "Moorcroft" on the label. There is no specimen in Liverpool from Choor. A specimen of *Wall.* 4713a is in Edinburgh (E–GL).

Delphinium incanum Royle, Ill. 55 (1834). XI/58. Royle cites the type specimen as collected by R. Inglis from Purbunee, Cashmere. A LIV specimen is probably the holotype but the label bears only the inscription "*D. incanum* Royle". A specimen from DD numbered 1/69 from Cashmere is also annotated "*Delphinium incanum* Royle" and may be type material, but it is a poor specimen without leaves. *D. incanum* Royle—non E. D. Clarke (1812) —is now known as *D. roylei* Munz.

Delphinium cashmerianum Royle, Ill. t. 12, f. 1–5 (Sept. 1833), 55 (1834). XI/59. In his protologue Royle stated that specimens were brought to him "from the garden of Shalimar, in Cashmere". A LIV specimen bears a label saying "*D. incanum* Rl., *Delphinium cashmerianum* Royle Cashmere 2nd year", with the epithet *cashmerianum* crossed out. A specimen from DD is labelled "1/72, *Delphinium cashmerianum* Rl., Cashmere, Shalimarbaugh". Shalimarbaugh means the garden of Shalimar (Hindi, etc.), and the evidence is therefore more in favour of the DD specimen being the type.

Delphinium vestitum [Wall. ex] Royle, Ill. 55 (1834). XI/60. The specimens cited by Wallich under *Wall.* 4715 are (a) Gossain Than, Wallich, and (b) Kumaon, Robert Blinkworth. The specimens cited by Royle from Choor, Peer Punjal, Nagkanda and Tuen are all on the same LIV sheet. With those in the Wallich herbarium they comprise syntypes of *D. vestitum*. It would be best to choose a lectotype from the Wallich herbarium. Specimens of *Wall.* 4715a & b are in Edinburgh (E, E–GL), and material of Royle's syntype collection from Choor is at DD, numbered 1/71.

Delphinium rectivenium Royle, Ill. 56 (1834). XI/61. A poor specimen in LIV from Tuen, the type locality, is probably the holotype. Another poor specimen on the same sheet is probably *Delphinium denudatum* [Wall. ex] Hook. f. & Thoms. A DD sheet numbered 1/73 is probably an isotype of *D. rectivenium* which is now regarded as a synonym of *D. vestitum* [Wall. ex] Royle.

Delphinium brunonianum Royle, Ill. 56 (1834). XI/62. Royle stated that he named the species in honour of Robert Brown, "to whom I am indebted for the use of the Herbarium collected by R. Inglis, Esq. in Kunawur. This plant was found by that gentleman on the Kongno Pass". A LIV specimen bears a label saying "*D. brunonianum* Royle, Kongno Pass" without mention of R. Inglis, but this specimen is presumed to be the holotype. A DD sheet numbered 1/75 is not a type. It has the annotation "*D. cashmirianum* Royle" in what is probably Hooker's hand, and below that "*Delphinium Brunonianum* Royle" in another hand.

Delphinium pyramidale Royle, Ill. 56 (1834). XI/63. The Royle herbarium specimen (LIV) bearing this name also has "PP" on the label, probably for Peer Punjal, as cited by Royle. Munz (*Journ. Arn. Arb.* 49:158, 1968) presumed this was a type specimen and I agree. It is probably the holotype.

Aconitum multifidum Royle, Ill. 56 (1834). XII/65. The specimen cited by Royle is from "mountains bounding Cashmere to the S W Wyrung Pass" collected by R. Inglis, and it is referred to by Stapf in "The Aconites of India" (*Ann. Roy. Bot. Gard. Calc.* 10:146, 1905). He cites "*A. multifidum* Royle (Hb. Cambr.)" in synonymy under *A. violaceum* Jacq. and later cites "above Pir Panjal, 9–10,000 ft., Royle's Coll. (Hb. Cambr.)". However, it is not known if the specimen cited is type material. The LIV specimen bearing the name *Aconitum multifidum* Royle has "Sept. 1819, locality unknown" written on the sheet and almost certainly is not a type. There are also two DD specimens both numbered 1/77, one labelled "*Aconitum multifidum* Royle, Cashmere", the other "*Aconitum speciosum* Kedar Kanta" (and

another locality which is illegible). Both have been identified as *A. violaceum* by Stapf. Depending on the result of the examination of the Cambridge material cited by Stapf, one of the DD sheets may have to be chosen as lectotype of *A. multifidum*.

Aconitum laeve Royle, Ill. 56 (1834). XII/66. Royle cites "Choor, Kunawur and Peer Punjal". I have seen only one specimen (LIV) from Kunawur, bearing the number 1/75, which I have chosen as the lectotype. According to Stapf there is a specimen in the Saharanpur herbarium (DD) collected by Royle (?) in 1825 on Mt Choor, and named "*Aconitum palmatum*" which he thought might pass as a type specimen, but I have not seen it. Stapf also cited the specimen at Kew labelled "*Aconitum lycoctonum*, *A. laeve* Royle, NW India, Hb. Royle" as a possible type specimen.

Aconitum cordatum Royle, Ill. 56 (1834). XII/67. Royle cites only "Cashmere" in his Synopsis. There is one LIV specimen without locality and the name *A. cordatum* Royle written on a capsule attached to the sheet, and another LIV specimen without any locality or other notes. Two loose labels, one of which says "*A. cordatum*" and the other "*A. heterophyllum*" accompany the specimen. However, in DD there is a collection labelled "*Aconitum cordatum*, Peer Punjal, Cashmeer" which provides the best evidence for typification and I choose it as the lectotype.

Aconitum heterophyllum [Wall. ex] Royle, Ill. t. 13, f. 1–4 (Sept. 1833), 56 (1834). XII/68. Cited under *Wall.* 4722 are two collections, from (a) Kumaon, by Robert Blinkworth, and (b) Sirmore, by Webb. In the Synopsis Royle states that *A. heterophyllum* is found on Choor, Shalma and Kedarkanta but I have not seen any specimens from these localities in either LIV or DD. *Wall.* 4722a & b can therefore be regarded as syntypes. There is material of both collections at Edinburgh (E–GL).

Cimicifuga frigida Royle, Ill. t. 14, f. a-i (Sept. 1833), 57 (1834). XIV/71. This species is based on *Actaea frigida*, Wall. Cat. 4725 *nom. nud.* The LIV specimen is not a type unless it is a duplicate of *Wall.* 4725 and there is no indication of this. Isotype specimens are at Edinburgh (E–GL). *C. frigida* is a synonym of *C. foetida* L.

Actaea acuminata [Wall. ex] Royle, Ill. 57 (1834). XIV/71. The syntypes are *Wall.* 4726 collected at Srinagar by Robert Blinkworth and a specimen at LIV cited by Royle from Choor. A specimen of *Wall.* 4726 is at Edinburgh (E–GL).

Paeonia emodi [Wall. ex] Royle, Ill. 57 (1834). XVII/72. The type is *Wall.* 4727 collected in Kumaon by Robert Blinkworth. In his Synopsis Royle cites "Hab. Shalma Mountain, Kemaon, Wall.", which is presumably the same collection. However, this specimen is not in the Royle herbarium although there is a specimen from Srinagar. A DD sheet labelled "1/80, *Paeonia emodi*, Kemaon, June 1832" may be a duplicate of the Blinkworth collection; if so, it is an isotype. At Edinburgh there is a specimen of *Wall.* 4727 (E) from Kumaon and another *Wall.* 4727 (E) labelled "Kumaon, R. Blinkw.". These two sheets are isotypes.

SUMMARY OF ROYLEAN TYPE SPECIMENS IN LIV & DD

Aconitum cordatum Royle	Lecto, DD
Aconitum heterophyllum [Wall. ex] Royle	None
Aconitum laeve Royle	Lecto, LIV
Aconitum multifidum Royle	None
Actaea acuminata [Wall. ex] Royle	Syntype, LIV
Adonis inglesii Royle	Probable holo, LIV
Anemone discolor Royle	Lecto, LIV
Anemone tetrasepala Royle	Probable holo, LIV
Anemone villosa Royle	Syntypes, LIV & DD
Anemone wallichiana Royle	None
Aquilegia moorcroftiana [Wall. ex] Royle	Type, LIV
Aquilegia pubiflora [Wall. ex] Royle	None
Aquilegia pubiflora [Wall. ex] Royle var. mussooriensis Royle	Probable type, LIV
Caltha govaniana [Wall. ex] Royle	Syntype, LIV
Cimicifuga frigida Royle	None
Clematis cordata Royle	Possible type, LIV
Clematis globosa Royle	Possible type, LIV
Clematis nutans Royle	Probable type, LIV
Clematis tenuifolia Royle	Possible type, LIV
Clematis venosa Royle	Type, DD
Delphinium brunonianum Royle	Probable holo, LIV
Delphinium cashmerianum Royle	Type, DD
Delphinium incanum Royle	Probable holo, LIV
Delphinium pyramidale Royle	Probable holo, LIV
Delphinium rectivenium Royle	Probable holo LIV; probable iso, DD
Delphinium vestitum [Wall. ex] Royle	Syntypes, LIV & DD
Isopyrum microphyllum Royle	None
Oxygraphis polypetala*	Type DD, suitable for lecto
Paeonia emodi [Wall. ex] Royle	Possible iso, DD
Ranunculus attenuatus D. Don in Royle	None
Ranunculus choorensis D. Don in Royle	Probable type, LIV
Ranunculus distans D. Don in Royle	Probable type, LIV
Ranunculus glabellus D. Don in Royle	Possible type, LIV
Ranunculus hirtellus D. Don in Royle	Syntype, LIV
Ranunculus laetus [Wall. ex] Royle	Syntype, LIV
Ranunculus membranaceus D. Don in Royle	None

* See under *Ranunculus polypetalus* p. 132.

Ranunculus mollis [Wall. ex] Royle	None
Ranunculus nervosus D. Don in Royle	Probable type, LIV
Ranunculus pimpinelloides D. Don in Royle	Probable type, LIV
Ranunculus polypetalus D. Don in Royle	Probable type, LIV
Ranunculus vitifolius D. Don in Royle	Type, LIV & DD; latter suitable for lecto
Thalictrum elegans [Wall. ex] Royle	Syntype, LIV
Thalictrum marginatum Royle	Probable holo, LIV; iso, DD
Thalictrum maxwellii Royle	Probable type, LIV
Thalictrum microphyllum Royle	Probable holo, LIV; iso, DD
Thalictrum neurocarpum Royle	Probable type, LIV
Thalictrum pauciflorum Royle	Probable holo, LIV
Thalictrum radiatum Royle	Probable holo, LIV; iso, DD
Thalictrum vaginatum Royle	Probable holo, LIV