

Isaac Carroll (1828-1880): a catalogue of lichens collected in Scandinavia in 1863 housed in the Herbarium, National Botanic Gardens, Dublin

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ABSTRACT: A lichen collection, containing 181 numbered packets from Scandinavia, made by the Irish botanist Isaac Carroll during 1863 is documented. Brief biographical notes on Isaac Carroll (1828-1880) are presented. The name *Pyrenocollema bryospilum* (Nyl.) Coppins is validated. *Verrucaria beloniella* Nyl. is lectotypified and synonymised with *Lecidella stigmatea* (Ach.) Hertel & Leuckert. *Stigmidium congestum* and *Lecidea hypopta* are added to the floras of Norway and Ireland respectively.

Key Words – Herbarium, Lichens, Isaac Carroll.

BIOGRAPHICAL NOTES ON ISAAC CARROLL

Isaac Carroll, a nineteenth century Irish botanist, was primarily a lichenologist. His contribution to botany has been written up by several researchers in recent decades (Cullinane 1973, Seaward et al. 1982, Parnell 1992, Mitchell 1996). Isaac Carroll was the only son of James Carroll¹ and wife Susannah, née Abbott². Born in Cork City on 28 April 1828, he died in Aghada, Co. Cork on 7 September 1880, aged 52. He was a Quaker and is interred at the Society of Friends' Burial Ground, Summerhill South, Cork (Mitchell, 1995, 1996). He corresponded with botanists from 19 Summer Hill, on the North side of Cork City, in 1858-60, 1862, 1864, 1867-8 and 1870 (Seaward *et al.*, 1982; Mitchell, 1996) and from 79 South Mall in 1858 and 1872³. The portrait of Isaac Carroll which now hangs in the herbarium in Glasnevin, was painted by Dublin born artist, Josephine Webb, R.H.A. (1853-1924)⁴. A photograph of Isaac Carroll is reproduced in Mitchell (1996: 7).

BUSINESS

Isaac Carroll is described as a timber merchant (Desmond, 1994) and this was his father's business. An embossed trade stamp on an envelope seen in the 1980s amongst material in **DBN** suggest that Isaac was engaged as a '*Corn & Flour Merchant*' in Cork in 1867. We were unable to relocate this envelope, but he also apprenticed in this trade in 1843 in Shackleton's flour mills, after leaving Newtown school in Waterford (Mitchell, 1996). On one occasion he wrote, that he had got '*a very good agency in addition to my present occupation which only takes up [a] portion of my time*', a statement which may indicate diverse business interests (Seaward *et al.*, 1982).

¹ James Carroll was born 17 xi 1791 and died 14 i 1874.

² Susannah Carroll, née Abbott, was born 22 viii 1800 and died 23 x 1844.

³ given as 79 Patrick Street.

⁴ Josephine Webb was from a Quaker family. She painted flowers and portraits and exhibited works in Dublin and Paris.

Genealogical records concerning James Carroll's family suggest that the family originated in Belfast and moved via Dublin to Cork (Lamb, *in litt.*, 1993), presumably to further their trade interests. Commercial trading documents from Cork in the mid-nineteenth century indicate that Isaac's father, James Carroll was a timber merchant and that he had a timber yard on Carroll's Quay, just off the west side of Leitrim Street, in Cork and that the business also had frontage to a deep water berth on the River Lee at Water Street. Other branches of the Carroll family were well established in the commercial life of Cork city from the 1800s (Harrison, 1994). Carroll's Bridge is just north of the old sand quay dock on Camden Quay. In 1999, a major development scheme was announced for Carroll's Quay and Camden Quay on the south bank of the River Lee (Barker, 1999).

BOTANY

Isaac Carroll was an excellent general botanist. His later work on the phanerogamic flora was directed towards a flora of County Cork (Allin, 1883). From his letters written to David Moore, it is apparent that Carroll had an interest in the cultivation of ferns. He published papers on seaweeds, mosses, lichens and flowering plants in the *Journal of Botany* and other journals of the time (Carroll, 1856, 1857, 1865, 1866 and 1867). He contributed information to many works; for example, Mudd (1861) incorporated Carroll's lichen locations and Bentham (1865) acknowledged *'the valuable notes communicated by Isaac Carroll of Cork'*. Moore & More (1866) included his flowering plant records from the Cork region. Leighton (1871) published records sent to him by Carroll who said, *'he was much pleased with my Irish novelties'*. Isaac Carroll corresponded with prominent botanists of the day including, David Moore, Director of the Botanic Gardens, Dublin (Nelson & McCracken, 1987), Admiral Theobald Jones, M.P. for Londonderry and William Nylander, the Finnish lichenologist in Paris (Ahti, 1990). According to some correspondence in **DBN** archives, Carroll had high hopes of a visit by Nylander to Ireland in 1859 but the visit did not take place. Many Carroll letters have been transcribed and published (Seaward *et al.*, 1982, Mitchell, 1996) but two letters in the Hunt Institute (Stieber & Karg, 1984: 136) have not been published.

Attention to the botanical interest of the Killarney area was noted by Carroll and he also highlighted the southern element present in the flora of SW Ireland (Mitchell, 1961). Carroll speculated on components in the flora of the region, *'at Killarney, Glengarriff ... there exists .. in a truly natural state a few distinctly ... tropical cryptogams, which latter appear nowhere else in Europe ...'* (Cusack 1875, Scannell, 1982).

SPECIMENS

The main collections of Isaac Carroll are in the herbaria of the Natural History Museum (**BM**) (Desmond, 1994) in London, Royal Botanic Garden Edinburgh (**E**), Trinity College Dublin (**TCD**) and we draw attention here to lichen material collected by Carroll in Scandinavia in 1863 in **DBN** at National Botanic Gardens, Glasnevin. In 1874, the year Carroll's father died, the **BM** records show that 3963 lichens were purchased from Isaac Carroll (Cullinane, 1970). Hedge & Lamond (1970) report 'bry. and lich. J. [sic] Carroll 1858' in the Edinburgh Herbarium, **E**, and some of his specimens there were examined by W. L. Lindsay who included some in an account of lichen pycnidia (Lindsay, 1869). Cullinane (*loc. cit.*) also reported some 500 Carroll lichen specimens in the Herbarium at University College Cork (**CRK**), and these are now in **TCD** (Webb, 1991). In 1859 Carroll issued a single fascicle of *Lichenes Hibernici Exsiccati* (Mitchell, 1971) and copies of this exsiccatum are held by several herbaria (**DBN**, **TCD**, **E**, **BM**, **K**, **BON**, **H**, **UPS**, etc.). Carroll also undertook extensive curatorial work in the vascular plant herbarium in Cork (**CRK**), which he expanded

to 60,000 sheets. This is highlighted in submissions to a public enquiry into activities at the University in the 1880s (Queen's Colleges (Ireland) Commission, 1885)

In spite of his poor health, to which he alludes occasionally in his letters, Carroll travelled abroad to observe the flora of other regions. We know from herbarium specimens that he was in Oxfordshire, England in 1849. In 1861, he travelled in Iceland (Carroll, 1867a) with two Quaker friends, Joseph Fisher Shackleton and Alfred Webb⁵ (J. Shackleton, personal communication). Hesselbo (1918: 397-398) noted the visit. According to Desmond (1994) specimens from this expedition are in the Natural History Museum (**BM**) in London. In July 1864, Admiral Jones and Carroll studied lichens on Ben Lawers, a mountain in Scotland noted for its rich alpine plant and lichen flora (Gilbert *et al.*, 1988). They collected many rarities from Ben Lawers new to the British Isles in the 1860s (Carroll, 1865, 1866, 1867b). These Scottish specimens are divided between **BM** and **DBN**, and the latter collections in the Jones herbarium await critical re-examination.

A common corticolous lichen in Atlantic woods in western Ireland *Japewiella carrollii* (Coppins & P.James) Printzen commemorates Isaac Carroll. Descriptions of this species are provided by Coppins & James (1979), Tønsberg (1990) and Printzen (1999).

CARROLL'S ITINERARY IN SCANDINAVIA IN 1863

The journey which concerns this paper was undertaken in 1863 to Scandinavia in the company of David Moore, Curator of the Botanic Gardens, Glasnevin, Dublin and Joseph Fisher Shackleton of Lucan (More, 1881, J. Shackleton *pers. comm.*). Moore (1866) published a descriptive account of the travel, noting: '*I arranged to accompany two friends [not named] who were going from Ireland, whose objects for making the journey were similar to mine*'. He left Glasnevin on 17th June, traversed England and left from Hull on 20th June. The party arrived in Christiansand on the 22nd of the month and travelled to Christiania (now Oslo), from thence to Moss, Sarpsborg, Eidsvoll, Lillehammar, Gudbrandsdal, Vigg, Kvam and Dombas. At this point the party dispersed; Moore, who was chiefly concerned with visiting horticultural centres, travelled to Dovrefjeld and later, on leaving Scandinavia, toured centres in Germany and Belgium. Carroll and Shackleton travelled on to Trondhjem, Tromsø, Bodö and Alten. Carroll wrote that from Alten '*we took ponies and crossed Lapland*' and noted the countryside there as, '*low, swampy with monotonous vegetation*'. They passed through Kautokeino, Haparanda, Torneå - the most northerly point of the Gulf of Bothnia - and then went to Skelefteå and Umeå. Specimens were collected in '*bogs, cornfields, churchyards, on river banks and on mountains to the snow line*', in June, July and August 1863 (Carroll, 1867b).

The reconstruction of the itinerary was hampered due to the fact that only collection months were given on the specimen labels. A definitive reference to the rail and ferry transport infrastructure available for use in the 1860s would have been particularly helpful. In order to assist readers tracing the journey on maps or abstracting distributional data, the specimens have been indexed by locality in an inferred chronogeographical sequence in Appendix 2. The niches and habitats for lichens in the landscape studied by Carroll at each locality in Scandinavia can be envisaged readily by readers considering each locality species list with current experience of the ecological knowledge of the lichens foremost in mind. In the specimen list, no ecological incongruities have been found regarding species distribution and the climate and topography expected at the localities mentioned.

⁵ Alfred Webb was a brother of Josephine Webb, R.H.A.

VASCULAR PLANTS FROM SCANDINAVIA

In the case of flowering plants, Carroll (1867b) enumerates 90 species and only included the more interesting records. At least 44 sheets of vascular plants collected by Carroll in Scandinavia are represented in **DBN**, and of these only 14 species were sufficiently noteworthy to have been published. Some specimens from Carroll's Norway and Lapland expedition are also in the National Museum of Wales (Harrison, 1992) and the Botany Department at Cambridge (Lanjouw & Stafleu, 1954: 117), but it remains unclear how many vascular plant specimens were collected on the expedition. For example, the **DBN** set of specimens includes, *Rubus arcticus* (flore pleno), with the comment, '*flower deeper coloured than usual and fragrant resembling a small crimson rose*'.

PUBLISHED LETTERS OF ISAAC CARROLL, THEOBALD JONES & WILLIAM NYLANDER

Some correspondence of Isaac Carroll, Theobald Jones and William Nylander preserved in Helsinki University Library has been published (Mitchell, 1996) and these letters provides interesting anecdotes referring to the Scandinavian expedition. Jones wrote to Nylander on July 8, 1863 '*... both Messrs Carroll and Moore left on the 19th of last month for a Botanical Excursion in Norway - so far the weather favors them*'. (Mitchell, 1996: 16). On August 17, 1863 Jones wrote to Nylander; '*I told you of the Excursion about to be made by Messrs Moore-Carroll and some Friends. Mr Moore's object was Norway. Mr Carroll intended something more extended - ending with Finland - they necessarily separated Moore has returned highly successful and delighted beyond measure ...*' Jones goes on to comment on Carroll's whereabouts '*Mr. Carroll has not been heard of - it was his intention to return by Dublin - he might have gone more direct by Steamer to Cork but if so I think he would have informed me by Letter*' (Mitchell, 1996: 17). In a letter of April 1, 1864 to Nylander, Jones wrote '*Of Mr Carroll I can give you an Account you know he visited Norway & Lapland last year - and not under circumstances favorable to the Collection of Lichens - but he did collect considerable quantity*' (Mitchell, 1996: 19).

UNPUBLISHED LETTERS FROM ISAAC CARROLL TO WILLIAM NYLANDER

Two other letters preserved in Helsinki University Library, with copies donated by Michael Mitchell to **DBN**, are transcribed below.

19 Summer Hill
Cork, May 5/64

My dear Sir,

During a portion of last summer, I made a hurried expedition thro' part of Norway & across Lapland ascending the Alten Valley & descending to Torneå. Although so extensive a tour admitted of but little lingering, I made a considerable collection of Flowering Plants & Lichens, the latter of which I have been trying to name with only partial success by your Lich. Scand. for a guide. I have now made up a large box full of duplicates which I should like you to look at, I intend forwarding the same very shortly. I shall of course prepay carriage as far as possible & you must let me know of any further charges that I may remit the amount to you or to Dr. Hooker for you. I also think that as there are a large number of species in the box which will take both time and trouble to make out satisfactorily (tho' no doubt most of them will be recognised by you at a glance) you should, if you think proper make some charge for naming the collection but I leave this to your own discretion - Concerning such species as I suppose are new to Fl. Scand, I have made remarks = Many species as Lecidea galbula, L. fuscescens Sommerfelt. L. carneo -pallida - Lecan. chlorophana &c, &c, have not been sent because I felt no hesitation about their identity - You will miss many arctic plants, but as I said before my tour was so hurried that I could not

linger long enough amongst the mountains to do much good & the lowlands of Lapland (about Matarengi & Torneå) appeared very poor in species. Let me hear from you as soon as the box has arrived safely.

Y'rs very truly
Isaac Carroll

Dr. Wm. Nylander
a Paris

19 Summer Hill, Cork
June 3/64.

My dear Sir

I am much obliged for the trouble you have taken with my specimens many of which were poor & small - you ask what tree Mycoporum ptelaeodes grew? I believe it grew on young Betula - I have only the two specimens of Verrucaria bryospila you saw and I wish to give Admiral Jones one specimen. I had the misfortune at the outset of my Lapland Journey to lose or break all my lenses & so was obliged to collect very much at random & no doubt to over-look some good things altho I certainly found the heart of Lapland very poor in species. I shall be glad to take a copy of M. Fellmans Lapland Lichens; which you can forward next time you are sending a parcel to Dr. Hooker, or to Admiral Jones.

With many thanks for the trouble you have taken.

I remain yours truly.

Isaac Carroll

P. S. 3 specimens are enclosed Please return the Pertusaria the names of the other two will be sufficient.

LICHEN SPECIES LIST

Carroll studied his material with great care, consulting Nylander (1861) *Lichenes Scandinaviae* for many species descriptions. As Jones wrote to Nylander '*He examines all of them even those he may be acquainted with (I believe) by section and by the aid of the Camera [lucida] makes a Drawing. This must be very tedious and I think unnecessary* (Mitchell, 1996: 19). Nylander (1864) described *Verrucaria beloniella*⁶ and *Verrucaria bryospila*⁷ from Carroll's specimens. The plants collected or noted during the Scandinavian tour are listed by Carroll (1865, 1867b), who remarked that he '*only enumerated the more interesting phanaerogams but have given the list of lichens entire, in order to compare with Dr. Lindsay's (1867) Contribution to the Lichen-flora of Northern Europe*'. Carroll (1867b) listed 184 species of lichens. 181 numbered collections were accessioned into the Admiral Jones herbarium in 1864 and catalogued (Jones manuscript, DBN). All but one of these numbered specimens were refound in 1998 and examined by HF.

LICHEN SPECIMEN LABELS

The labels, on which the lichen specimens are glued, are written in the clear legible hand of Carroll, and often there are notes referring to the thallus, hymenium, paraphyses, ascospores or other features. On many packets, Carroll made camera lucida drawings. Some annotations are by Carroll while others are in the hand of Admiral Theobald Jones. Virtually all of the packets are numbered by Jones, and correspond to his accessions catalogue (Jones manuscript, 1864). On some specimens, there are species names, underlines, question marks and 'x' marks in red ink in the hand of William Nylander of Paris, and there is

⁶ see Appendix 1 #73: *Lecidella stigmatea*

⁷ see Appendix 1 #135: *Pyrenocollema bryospilum*

correspondence indicating that Nylander examined some specimens now in **DBN** (Mitchell, 1996).

FORMAT OF THE CATALOGUE

The lichens are listed alphabetically in Appendix 1 by the name under which each specimen is now filed in **DBN**. The name that follows is that written on the specimen by Carroll. All the notes on the specimen label are transcribed with attention to author abbreviations, punctuation and underlining. The place names are given exactly as on the Carroll label, for example Trondhjem. If graphics are drawn on the label a description is provided. Handwriting of Carroll, Jones and Nylander is clearly distinguished. Not all the localities mentioned on the specimen labels were included in Carroll's (1867b) paper, and these are presented here in full in Appendix 2. The collections are now wrapped in folded packets and mounted on sheets. All bear a new printed label with the footer: Carroll 1863 Scandinavian lichens, Scannell 1998.

IDENTIFICATION AND NOMENCLATURE

The lichen specimens were checked by HF against Swedish and English species descriptions in current floras, Moberg & Holmåsén (1990), Foucard (1990) and Purvis *et al.* (1992) and some literature indicated by Santesson (1993). In comparatively few cases, revision of the species identifications were required. Nomenclature follows either Santesson (1993) or Vitikainen *et al.* (1997) and in almost all cases alterations in nomenclature and/or authority citations were required.

SPECIMENS OF PARTICULAR INTEREST

The 1863 collections are richer than anticipated and several extra species have been found. Species newly identified in the collection include: *Arthonia intexta*, *Bryoria chalbeiformis*, *Lecanora rugosella*, *Peltigera neckeri*, *Protoblastenia siebenhaariana*, *Pseudephebe miniscula*, *Stigmidium congestum*, *Umbilicaria polyrrhiza*, *Umbilicaria rigida* and *Xanthoria soreidiata*.

Stigmidium congestum (Körb.) Triebel

The lichenicolous fungus *Stigmidium congestum* is widespread in Europe. This is the first record from Norway and Carroll's specimen is from near Sarpsborg on *Lecanora rugosella*. *S. congestum* has been recorded from Austria, France, Germany, Italy, Spain, Sweden, Switzerland and Turkey (Roux & Triebel, 1994) and has subsequently been reported from Scotland.

Two species, *Verrucaria beloniella* and *Verrucaria bryospila*, originally described from Isaac Carroll's collection (Nylander, 1864) deserve further comment.

Lecidella stigmatea (Ach.) Hertel & Knopf

Verrucaria beloniella Nyl., *Flora, Jena* **47**: 354, 1864. – Typus: Quam, Gudbrandsdal, Norway, June 1863. I.Carroll, (**UPS** – isotypus); *ibid.*, (**DBN**, Jones herb. 176 – isotypus). (Lectotype of *Verrucaria beloniella* Nyl. selected here to be the lichen part of the **DBN** specimen)., **syn. nov.**

Carroll submitted the specimen with the letter of 5 May 1864 to Nylander, with a pencil drawing of an ascotal section and 3-septate ascospores. On the basis of Carroll's drawings, and a second examination of the specimen, Nylander described the species as new. The original description refers to a lichen thallus with perithecia containing 3-septate ascospores. A subsample was kept by Nylander (**UPS**) and the rest returned to Carroll

(DBN). When the **UPS** specimen was re-examined by Keissler (c. 1920s), it was considered an unidentified discocarpous lichen (Santesson, 1984: 329, 1993: 235).

On recent examination of the **DBN** specimen by HF, the most conspicuous microscopic features were the oil droplets in the reddish-yellow hymenium and 3-septate ascospores. As a lichenised discomycete on calcareous schist, many *Toninia* species have 3-septate ascospores, and hence the material was sent to Einar Timdal, the *Toninia* specialist, for study. The **DBN** specimen was determined by Reidar Haugan as *Lecidella stigmatea*, but the two previous observations of 3-septate ascospores were not repeated. On receiving the redetermined specimen from Oslo, a second slide was prepared and confirmed the simple ascospores of *Lecidella stigmatea*. The thallus is in agreement with other *Lecidella stigmatea* specimens in **DBN**, including the two other specimens⁸ collected by Carroll in Norway.

A common lichenicolous fungus on *Lecidella stigmatea* is *Arthonia intexta* (Hertel 1969), and this species is widespread and common in Europe. The fungus inhabits the hymenium of the host ascomata, and asci and paraphysoids are intermixed with those of the host. This *Arthonia* has 3-septate ascospores with shape and dimensions in agreement with the drawing of Carroll and published measurements of Nylander (1864). On the basis of the results from Carroll's, Nylander's, Keissler's, HF's and Haugan's study of the **UPS** and **DBN** specimens of *Verrucaria beloniella* Nyl., it is now certain that Carroll collected *Lecidella stigmatea* infected with *Arthonia intexta*.

With this new determination, it is clear that the description of *Verrucaria beloniella* Nyl., 1864 is based on heterogeneous elements; a thallus and apothecia of a lichen *Lecidella stigmatea* and ascospores of a lichenicolous fungus *Arthonia intexta*. In making a suitable choice of lectotype, it is worth noting that Nylander indicated that the new species was a lichen. By lectotypifying the name on the lichen part in the type material, *Verrucaria beloniella* Nyl. can be added to the synonyms of *Lecidella stigmatea* (Ach.) Hertel & Leuckert. The alternative is less attractive in terms of nomenclatural stability, as the name *Arthonia intexta* would be displaced. The lichen *Lecidella stigmatea* (Ach.) Hertel & Leuckert is a taxon whose basionym was introduced in the early 1800s. The name *Verrucaria beloniella* predates the lichenicolous fungus *Arthonia intexta* by 16 years. Taxonomic research on *Arthonia intexta* (Hertel 1969), has revealed that microscopical observations of *Arthonia intexta* on *Lecidella* have been incorrectly interpreted many times by lichenologists. Further data on the nomenclatural synonyms of *Arthonia intexta* is provided by Triebel (1989).

It is interesting that another interhymenial lichenicolous fungus, first found in Europe by Isaac Carroll in 1867 in South West Ireland, was morphologically misinterpreted for well over a century. Ascospores of the host and parasite were detected in a single microscope slide preparation made in June 1994 from a specimen collected in St. John's Wood, Co. Roscommon in December 1992. *Melaspilea diplasiospora* (Nyl.) Mull. Arg. (1887) in the British Isles (syn. *Arthonia punctilliformis* Leighton, *Trans. Linn. Soc. Lond.*, ser. 2, Bot., 1: 146, 1876) is now understood to be an interhymenial parasite of decaying *Graphis elegans*.

Pyrenocollema bryospilum (Nyl.) Coppins ex H. F. Fox **comb. nov.**

Verrucaria bryospila Nyl. in *Flora Jena* **47**: 355, 1864.

Arthopyrenia bryospila (Nyl.) Arnold in *Flora (Regensburg)* **53**: 484, 1870.

⁸ see Appendix 1 #71 & #72: *Lecidella stigmatea*.

Pyrenocollema bryospilum (Nyl.) Coppins in Purvis *et al.*, *Lichen Flora of Great Britain and Ireland*: 516, 1992. *nom. inval.* (Invalidly published, no basionym cited, Article 33.2, Toyko code 1994)

This remains a very poorly collected species on moss or hepatic-covered ledges on calcareous rocks from arctic montane climates in Scotland (Coppins, 1992: 516), Norway (Nylander, 1864: 357, Carroll, 1867b: 340) and Sweden (Santesson, 1993: 20). There are two localities known in Scotland; Ben Lawers (Carroll, 1865: 293, Gilbert *et al.*, 1988) and Ben Alder (Gilbert *et al.*, 1982).

The name *Pyrenocollema bryospilum* (Nyl.) Coppins (Purvis *et al.* 1992: 516) was introduced citing Coppins *et al.* (1992). Despite the introduction of several combinations into *Pyrenocollema* in this latter paper, this particular combination was inadvertently omitted. As no basionym was cited, the combination *Pyrenocollema bryospilum* as undertaken in 1992 remains invalid. The opportunity to rectify this matter is taken above, and the required combination is made.

The type of *Verrucaria bryospila* in **UPS** has been examined by Grube & Hafellner (1990: 333-335). Grube (in litt. electr. 11 xi 1999) wrote: 'This species has nothing to do with *Arthopyrenia*. A new genus separate from *Arthopyrenia* and *Pyrenocollema* will ultimately have to be established to accommodate this, and some other taxa currently in *Cercidiospora* and *Pyrenocollema*'.

SCIENTIFIC USE AND HISTORY OF THE COLLECTION

The 1863 collection was accessed into the herbarium of Admiral Theobald Jones (Jones, 1864 manuscript), who often purchased exsiccati and herbarium collections of other lichenologists. Carroll's account was published in 1867. The Jones herbarium was transferred from the Royal Dublin Society founded 1731 to the Natural History division of the Science and Art Museum, and then to the Botanical division in 1892, where the collection was registered on 19 May 1911 (**DBN** accessions register 2: 287). The Admiral Jones cabinets were catalogued by Pim (1888) and Matilda Knowles checked what was there in 1924 (Knowles manuscript). The collection was moved from the National Museum to Glasnevin in 1970 and rehoused in a new herbarium building in 1998 (Fox, in press).

In **DBN**, two Scandinavian collections were accessed to the Jones Herbarium prior to 1865; exsiccati of Theodor Magnus Fries (1832-1913) and Nils Isak Fellman (1841-1919). Carroll's Scandinavian lichen collection in 1863 was scientifically significant in the context of lichenology in the 1860s in that it extended both Admiral Jones' and Isaac Carroll's experience of identifying arctic and boreal lichens. This equipped⁹ Carroll and Jones for 'the major Victorian initiative' on Ben Lawers, Scotland in 1864 (Gilbert *et al.*, 1988) which added many lichens to the flora of Britain.

Carroll's Scandinavian collection remains a scientifically useful resource in **DBN**; indeed *Lecidea hypopta*¹⁰ was collected for the first time in Ireland shortly after the Carroll specimen¹¹ was examined. We hope that this paper will encourage lichenologists to consider Carroll's collection in **DBN** in research on Scandinavian lichens. Indeed, a lichen

⁹ One third of the lichen species represented in Carroll's Scandinavian collection have populations on Ben Lawers, according to floristic data in Gilbert *et al.* 1988.

¹⁰ *Lecidea hypopta*, on lignum of standing dead pine, Coronation Plantation, 3.5km WNW of Sally Gap, Co. Wicklow, 12 June 1999, Fox 121, **DBN** Reg. 17: 1999, first Irish record.

¹¹ See Appendix 1 #61: *Lecidea hypopta*.

field trip retracing some or all of the species and places on Carroll's journey, equipped with Nylander's (1861) *Lichenes Scandinaviae*, would be an interesting experience to bring ones mind back into tune with mid 19th century lichenology.

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REFERENCES

- Ahti, T. 1990.** *Collected papers of William Nylander*. Volume 1. Cramer. Vaduz.
- Allen, D. E. 1986.** *The Botanists*. London: St. Paul's Bibliographies.
- Allin, T. 1883.** *The flowering plants and ferns of the County Cork*. Weston-super-Mare: published privately.
- Barker, T. 1999.** South Bank scheme for city. *Cork Examiner* Saturday 29 May 1999.
- Bentham, G. 1865.** *Handbook of the British Flora. Vol. 1*. London: Lovell, Reeve & Co.
- Carroll, I. 1856.** New or scarce mosses found chiefly in the County of Cork. *Phytologist 1* (new series): 236-239.
- Carroll, I. 1857.** Notice of scarce Irish plants. *Phytologist 2* (new series): 76-77.
- Carroll, I. 1859.** *Lichenes Hibernici Exsiccati*, fasc. I, nos. 1-40. Cork: George Purcell & Co.
- Carroll, I. 1865.** Contributions to British Lichenology: being notices of new or rare species observed since the publication of Mudd's 'Manual', I. *Journal of Botany, London 3*: 286-293.
- Carroll, I. 1866.** Contributions to British Lichenology: being notices of new or rare species observed since the publication of Mudd's 'Manual', II. *Journal of Botany, London 4*: 22-26.
- Carroll, I. 1867a.** On some plants observed in Iceland in June, 1861. *Journal of Botany, London 5*: 107-110.
- Carroll, I. 1867b.** On some plants (especially lichens) collected during the Summer of 1863 in Norway and Lapland. *Journal of Botany, London 5*: 329-340.
- Coppins, B. J. 1992.** *Pyrenocollema* Reinke (1885), in Purvis, O. W., Coppins, B. J., Hawksworth, D. L. & Moore, D. M., (Eds) *Lichen flora of Great Britain and Ireland*. pp. 515-519. London: Natural History Museum and British Lichen Society..
- Coppins, B. J. & James, P. W. 1979.** New or interesting British lichens IV. *Lichenologist 11*: 139-179.
- Coppins, B. J., James, P. W. & Hawksworth, D. L. 1992.** New species and combinations in *The Lichen Flora of Great Britain and Ireland*. *Lichenologist 24*: 351-369.

- Cullinane, J. P. 1970.** Isaac Carroll herbarium University College Cork. *University College Cork Record* **45**: 14-16.
- Desmond, R. 1994.** *Dictionary of British and Irish botanists and horticulturalists including plant collectors, flower painters and garden designers*. London: Taylor & Francis and the Natural History Museum.
- Foucard, T. 1990.** *Svensk skorplavsflora*. Stockholm: Interpublishing.
- Fox, H. F. (in press).** Lichen herbarium resources in Ireland, *In* Rushton B. S., Hackney, P., Tyrie, C. R., (eds.) *Biological Collections & Biodiversity*. London: Linnean Society.
- Gilbert, O. L., Fox, B. W. & Purvis, O. W. 1982.** The lichen flora of a high-level limestone-epidiorite outcrop in the Ben Alder range, Scotland. *Lichenologist* **14**: 165-174.
- Gilbert, O. L., Coppins, B. J. & Fox, B. W. 1988.** The lichen flora of Ben Lawers. *Lichenologist* **20**: 201-243.
- Grube, M. & Hafellner, J. 1990.** Studien an flechtenbewohnenden Pilzen der Sammelgattung *Didymella* (Ascomycetes, Dothideales). *Nova Hedwigia* **51**: 283-360.
- Grumann, V. 1974.** *Biographisch-bibliographisches Handbuch der Lichenologie*. Lehre: Cramer.
- Harrison, R. S. 1994.** The Carroll family: a Cork Quaker business dynasty. *Journal of the Friends' Historical Society* **57**: 33-51.
- Hesselbo, A. 1918.** The Bryophyta of Iceland, *in* Rosenvinge, L.K. & Warming, E. (Eds) *The Botany of Iceland*. Part II, pp. 395-450. Copenhagen: J. Frimodt.
- Hedge, I. C. & Lamond, J. M. 1970.** *Index of Collectors in the Edinburgh herbarium*. Edinburgh: HMSO.
- Hertel, H. 1969.** *Arthonia intexta* Almqu., ein vielfach verkannter fruchtkörperloser Flechtenparasit. *Berichten der Deutschen Botanischen Gesellschaft* **82**: 209-220.
- Leighton, W. A. 1871.** *The lichen flora of Great Britain, Ireland and the Channel Islands*. Shrewsbury: privately printed.
- Leighton, W. A. 1879.** *The lichen flora of Great Britain, Ireland and the Channel Islands*. Third edition. Shrewsbury: privately printed.
- Lindsay, W. L. 1867.** Contribution to the Lichen-flora of Northern Europe. *Journal of Botany, London* **5**: 365-416.
- Lindsay, W. L. 1869.** Observations on new lichenicolous micro-fungi. *Transactions of the Royal Society of Edinburgh* **25**: 513-555.
- Mitchell, M. E. 1961.** L'Elément eu-océanique dans la flore lichénique du sud-ouest de l'Irlande. *Revista de Biologia Lisboa* **2**: 177-256.
- Mitchell, M. E. 1971.** *A bibliography of books, pamphlets and articles relating to Irish lichenology 1727-1970*. Galway: Officina Typographica.
- Mitchell, M. E. 1995.** 150 years of Irish lichenology: a concise survey. *Glasra* **2** (new series): 139-155.
- Mitchell, M. E. 1996.** Letters of William Nylander, David Moore, Isaac Carroll and Charles du bois Larblestier, 1850-1880. *National Botanic Gardens, Glasnevin, Occasional papers* **10**: 1-64.
- Moberg R. & Holmåsén I. 1990.** *Lavar: En fälthandbok*. 3ed. Stockholm: Interpublishing.
- Moore, D. & More, A. G. 1866.** *Cybele Hibernica*. Dublin: Hodges, Smith & Co.
- Moore, D. 1866.** Notes on a botanical and horticultural tour through parts of Scandinavia, Germany and Belgium, in the year 1863. *Journal of the Royal Dublin Society* **4**: 1-16, 189-205.

- [More, A. G.] 1881. [Obituary of Isaac Carroll] *Journal of Botany, London* **19**: 128.
- Mudd, W. 1861. *A manual of British lichens, containing descriptions of all the species and varieties*. Darlington: printed for the author.
- Nylander, W. 1861. *Lichenes Scandinaviae*. Helsingfors.
- Nylander, W. 1864. *Pyrenocarpei quidam europaei novi*. *Flora, Jena* **47**: 353-359.
- Parnell, J. 1992a. Isaac Carroll's 'Cryptogamic Flora' of County Cork - the fragments in Trinity College, Dublin. *Glasra* **1** (new series): 135-159.
- Parnell, J. 1992b. Isaac Carroll's cryptogamic flora of County Cork. *Occasional Papers National Botanic Gardens, Glasnevin, Dublin* **6**: 1-41.
- Pim, G. 1888. *Catalogue of the collection of British lichens, originally presented to the Royal Dublin Society, on 28th March, 1864 by the late Admiral Jones, F.L.S., F.G.S.* Dublin: Science and Art Museum.
- Printzen, C. 1999. *Japewiella* gen. nov., a new lichen genus and a new species from Mexico. *Bryologist* **102**: 714-719.
- Purvis, O. W., Coppins, B. J., Hawksworth, D. L., James, P. W. and Moore, D. M., (Eds.) 1992. *Lichen flora of Great Britain and Ireland*. London: Natural History Museum and British Lichen Society.
- Queens Colleges (Ireland) Commission 1885. *Reports of the Commissioners appointed by His Excellency John Poyntz, Earl Spencer, K.G., Lord Lieutenant of Ireland, to inquire into certain matters affecting the well-being and efficiency of the Queen's Colleges in Ireland, together with Minutes of the various meetings of the Commission, Minutes of Evidence, Documents, Returns and Tables. Presented to both houses of Parliament by Command of Her Majesty*. Alex. Thom & Co. (Ltd.), Dublin.
- Roux, C. and Triebel, D. 1994. Révision des espèces de *Stigmidium* et de *Sphaerellothecium* (champignons lichénicoles non lichénisés, Ascomycetes) correspondant à *Pharcidia epicymatia* sensu Keissler ou à *Stigmidium schaeferi* auct. *Bulletin de la Société linnéenne de Provence* **45**: 451-542.
- Santesson, R. 1984. *The Lichens of Sweden & Norway*. Stockholm and Uppsala: Swedish Museum of Natural History.
- Santesson, R. 1993. *Catalogue of lichens and lichenicolous fungi of Sweden & Norway*. Lund: SBT förlaget. 240 pp.
- Scannell, M. J. P. 1982. Southern elements in the cryptogamic flora of Ireland. *Journal of Life Sciences, Royal Dublin Society* **4**: 189-205.
- Seaward, M. R. D., Nelson, E. C. & Coppins, B. J. 1982. David Moore and Isaac Carroll: some lichenological and bryological correspondence. *Glasra* **6**: 73-96.
- Stieber, M. T. & Karg, A. L. 1984. Guide to the Botanical Records and Papers in the Archives of the Hunt Institute. Part 2. *Huntia* **5**(3): 107-210.
- Tønsgberg, T. 1990. *Japewia subaurifera*, a new lichen genus and species from north-west Europe and western North America. *Lichenologist* **22**: 205-212.
- Triebel, D. 1989. Lecideicole Ascomyceten: Eine Revision der obligat lichenicolen Ascomyceten auf lecideoiden Flechten. *Bibliotheca Lichenologica* **35**: 1-278.
- Vitikainen, O., Ahti, T., Kuusinen, M., Lommi, S. & Ulvinen, T. 1997. Checklist of lichens and allied fungi of Finland. *Norlinnia* **6**: 1-140.
- Webb, D. A. 1991. The Irish and British plants in the herbarium of Trinity College, Dublin II. The non-vascular plants. *Irish Naturalists' Journal* **24**: 69-72.

APPENDIX 1

CATALOGUE

1. *Acarospora fuscata* (Schrad.) Th.Fr. as *Lecanora fuscata* (Schrad). Trondhjem, Norway, July 1863. I.C. No. 61.
2. *Acarospora sinopica* (Wahlenb.) A.Massal. as *Lecanora fuscata* (Schrad) v. *sinopica* (Sm). Between Matarengi and Haparanda, Lapland. July 1863. I.C. No. 62.
3. *Alectoria ochroleuca* (Hoffm.) A.Massal. as *Alectoria ochroleuca* (Ehrh) Nyl. Mt. over Nystuen, Romsdal, Norway July 1863 I.C. No. 5.
4. *Alectoria sarmentosa* (Ach.) Ach. as *Alectoria jubata* (L) typica. Near Sarpsborg, Norway, June 1863. I.C. No. 1.
5. *Allantoparmelia alpicola* (Ach.) Essl. as *Parmelia alpicola* Th. Fr. Trondhjem, Norway, July, 1863. I.C. No. 103. Annotated by Nylander in red ink: '*alpicola* Th. Fr.' Numbered incorrectly as No. 104. *vide* Jones manuscript 1864: 51.
6. *Allantoparmelia alpicola* (Ach.) Essl. as *Parmelia alpicola* Th. Fr. var. Lapland, July 1863. I.C. No. 104.
7. *Amandinea punctata* (Hoffm.) Coppins & Scheid. as *Lecidea myriocarpa* DC. Churchyard, Torneå, July, 1863. I.C. No. 82.
8. *Arctomia delicatula* Th. Fr. as 2. *Arctomia delicatula* Th.Fr., 1. *Lecidea vernalis* Ach., 3. *L. parasema* Ach. v. Mt. over Kaafjord, Alten, Norway, July 1863. I.C. No. 91. Carroll made pencil drawing of ascospores of 1. & 2.
9. *Arctoparmelia centrifuga* (L.) Hale as *Parmelia centrifuga* Ach. Kautokeino, Lapland, July 1863. I.C. No. 107.
10. *Arthonia patellulata* Nyl. as *Arthonia patellulata* Nyl. Haparanda, Swedish Lapland, Aug. 1863, I.C. No. 166.
11. *Arthonia radiata* (Pers.) Ach. as *Arthonia astroidea* Ach. var. Onska, Swedish Lapland, Aug. 1863. I.C. No. 165.
12. *Aspicilia cinerea* (L.) Körb. as *Lecanora cinerea* (L.) v. voluta Ach. Trondhjem, Norway. July 1863. I.C. No. 38.
13. *Biatora vernalis* (L.) Fr. as 1. *Lecidea vernalis* Ach. 2. *Lecidea* - n.sp.? Mt. over Kaafjord, Alten, Norway, July 1863. I.C. No. 92.
14. *Bryocaulon divergens* (Ach.) Kärnefelt as *Alectoria divergens* (Ach.) Mt. over Nystuen, Romsdal, Norway, July 1863. I.C. No. 4.
15. *Bryonora castanea* (Hepp) Poelt as *Lecidea castanea* Hepp. f. *obscurior* Near Quam, Gudbrandsdal, Norway. ~~June~~ July 1863. I.C. No. 77. '*Lecidea castanea* Hepp 0,014-18 [x] 0,006-7 [mm]'. G[el]. h[ym]. iodo vinace procedent caerulentis iaeus. Drawing of five simple ascospores.
16. *Bryoria chalybeiformis* (L.) Brodo & D.Hawksw. as *Alectoria jubata* (L.) Ach. Mt. over Nystuen, Romsdal, Norway. July 1863. I.C. No. 2.
17. *Bryoria fuscescens* (Gyeln.) Brodo & D.Hawksw. as *Alectoria jubata* (L) Ach f. *Avasaxa*, Lapland, July, 1863. I.C. No. 3.
18. *Buellia disciformis* (Fr.) Mudd as *Lecidea disciformis* Fr. Onska, Swedish Lapland, Aug 1863. I.C. No. 69.
19. *Buellia disciformis* (Fr.) Mudd as *Lecidea disciformis* Fr. Alten Valley, Lapland, July 1863. I.C. No. 70.

20. *Buellia disciformis* (Fr.) Mudd as *Lecidea disciformis* Fr. Mt. over Nystuen, Romsdal, Norway. 7/63. I.C. No. 71.
21. *Caloplaca ammiospila* (Wahlenb. in Ach.) as *Lecanora ferruginea* (Huds). v. *musciicola*. Alten Valley, Lapland, July 1863, I.C. No. 43.
22. *Caloplaca crenularia* (With.) J.R.Laundon as *Lecanora ferruginea* v. *festiva* Ach. Trondhjem, Norway June 1863. I.C. No. 42.
23. *Caloplaca flavorubescens* (Huds.) J.R.Laundon as *Lecanora aurantiaca* Ach. Near Sarpsborg, Norway, June 1863. I.C. No. 32.
24. *Caloplaca holocarpa* (Hoffm. ex Ach.) A.E. Wade as *Lecanora holocarpa* (Ehrh.) churchyard, Torneå July 1863. I.C. No. 40. 'L. par on L. vitell sp. like [...] + disc' – I. Carroll.
25. *Caloplaca pyracea* (Ach.) Th.Fr. as *Lecanora pyracea* Ach. Haparanda, Swedish Lapland. August 1863. I.C. No. 46. Ascospore drawing in black ink & 'I don't think it a good species' – I. Carroll. '*Lecan. pyracea* Ach.' – W. Nylander in red ink.
26. *Catolechia wahlenbergii* (Ach.) Körb. as *Lecidea galbula* Ram. *L. Wahlenbergii* Ach. Mt. over Nystuen, Romsdal, Norway, July 1863. I.C. No. 163.
27. *Cetraria cucullata* (Bellardi) Ach. as *Cetraria cucullata* Hffm. Mt. over Nystuen, Romsdal, Norway 7/63 I.C. No. 11.
28. *Cetraria ericetorum* Opiz as *Cetraria islandica* (L). v. - *crispa* Ach. Hill near Matarengi, Lapland (Russian side) July 1863. I.C. No. 12.
29. *Cetraria sepincola* (Ehrh.) Ach. as *Platysma sepnicolum* (Hffm. Muionvara, Lapland. July 1863. I.C. No. 144.
30. *Cetrariella delisei* (Bory ex Schaer.) Kärnefelt as *Cetraria Delisei* Schær. Near Matarengi, Lapland, July 1863. I.C. No. 9.
31. *Cetrariella delisei* (Bory ex Schaer.) Kärnefelt as *Cetraria Delisei* Schær. Syvajarvi Station, Lapland, July 1863. I.C. No. 10.
32. *Cladonia amaurocraea* (Flörke) Schaer. as *Cladonia amaurocraea* Flk. Muionvara, Lapland, July 1863. I.C. No. 20.
33. *Cladonia cornuta* (L.) Hoffm. as *Cladonia cornuta* Fr. Matarengi, Lapland, July 1863. IC. No. 16. *Cl. cornuta* – Nylander, in red ink.
34. *Cladonia pleurota* (Flörke) Schaer. as *Cladonia cornucopioides* (L). Kautokeino, Lapland, July 1863. I.C. No. 17.
35. *Cladonia pleurota* (Flörke) Schaer. as *Cladonia cornucopioides* (L). Avasaxa, Russian Lapland. July 1863. IC. No. 18. Nylander's wrote in red ink: *Cl. cornucopioides*
36. *Cladonia stellaris* (Opiz) Pouzar & Vezda as *Cladonia rangiferina* (L.) Near Matarengi, Lapland, July 1863. I.C. No. 14.
37. *Cladonia sulphurina* (Michx.) Fr. as *Cladonia deformis* Hffm. Near Matarengi, Lapland, July 1863. I.C. [No. 19.]
38. *Cladonia uncialis* (L.) Weber ex F.H. Wigg. as *Cladonia uncialis* f. ? Muionvara, Lapland, July 1863. IC. No. 15.
39. *Clauzadea monticola* (Schaer.) Hafellner & Bellem. as *Lecidea fuscorubens* Nyl. Near Trondhjem, Norway, June 1863. I.C. No. 80. Nylander inked in '*fuscorubens* Nyl.' in red.

40. *Collema flaccidum* (Ach.) Ach. as *Collema flaccidum* Ach. Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 21.
41. *Cornicularia normoerica* (Gunnerus) Du Rietz as *Platysma triste* (Web.). Christiansund, Norway. July 1863. I.C. No. 143.
42. *Diploschistes scruposus* (Schreb.) Norman as *Urceolaria scruposa* Ach. et *Lecanora vitellina* Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 102.
43. *Fuscidea cyathoides* (Ach.) V. Wirth & Vezda as *Lecidea rivulosa* Ach. Bodö, Norway, July, 1863, I.C. No. 94.
44. *Fuscopannaria leucophaea* (Vahl) P.M. Jørg. as *Pannaria microphylla*. Sw. Kautokeino, Lapland, July 1863. I.C. No. 124. 'Hyphae pale paraph discreet but in bundles by reason of the dark threads being glued together. Spores elliptic or oblong oval – 0006 by 00028. Iod. pale blue & yellow. 0.016 [x] 0.007 [mm]' – T. Jones.
45. *Hypocenomyce scalaris* (Ach.) M.Choisy as *Lecidea ostreata* Hffm. Muionvara, Lapland July 1863. I.C. No. 85.
46. *Hypogymnia austerodes* (L.) Nyl. as *Parmelia physodes* Ach form. *obscurata* Ach. Gudbrandsdal, Norway, June 1863. I.C. No. 115.
47. *Hypogymnia physodes* (L.) Nyl. as *Parmelia physodes* (L). Alten Valley, Lapland July 1863, I.C. No. 113.
48. *Hypogymnia vittata* (L.) Parrique as *Parmelia physodes* (L.) v. *vittata* Alten Valley, Lapland, July 1863. I.C. No. 114.
49. *Icmadophila ericetorum* (L.) Zahlbr. as *Baeomyces icmadophilus* (Ehrh). Mt. over Nystuen, Romsdal, Norway, July, 1863. I.C. No. 8.
50. *Imshaugia aleurites* (Ach.) S.L.F. Meyer as *Parmelia aleurites* Ach. (non Sm.) Alten Valley, Lapland, July 1863, I.C. No. 106.
51. *Koerberiella wimmeriana* (Körb) B. Stein as *Lecanora cinerea* (L.) Nr. Quam, Gudbrandsdal, Norway, July 1863. I.C. No. 37. 'I don't think so' - M.C. Knowles. The material is meagre and the redetermination is tentative – H. Fox.
52. *Lasallia pustulata* (L.) Mérat. as *Umbilicaria pustulata* Hffm. Rocks nr. the Sarpsvoss, Norway, June 1863. I.C. No. 146.
53. *Lecania erysibe* (Ach.) Mudd as *Lecanora erysibe* Ach. Near Quam, Gudbrandsdal, Norway. July 1863. I.C. No. 39. Carroll notes 'hym. gel. nit. caer.'
54. *Lecanora albella* (Pers.) Ach. as *Lecanora albella* (Pers). Onska, Swedish Lapland. Aug. 1863. I.C. No. 41.
55. *Lecanora argentata* (Ach.) Malme as *Lecanora subfusca* Ach. Muionvara, Lapland, July 1863. I.C. No. 48.
56. *Lecanora argopholis* (Ach.) Ach. as *Lecanora argopholis* Wahl. Quam, Gudbrandsdal, Norway, July 1863. I.C. No. 33. Sketch of ascospores in black ink, .00044 by .00028, Iod. blue – T. Jones.
57. *Lecanora cenisia* Ach. as *Lecanora subfusca* Ach v. *atrynea* Ach. Trachyte near Krisuvik, Iceland. Dr. Hjaltelin. No. 50. Isaac Carroll visited Iceland in 1861 (Carroll 1867a) and was sent specimens collected by Dr. Hjaltelin The specimen postdates Oddur Jönsson Hjaltalín who died on 12 May 1840 (Grumann 1974: 794). Carroll must have been in contact with another Hjaltalín, probably Jón A. Hjaltalín, who was a schoolmaster at Möðruvellir for several years. There are at least two specimens of plants collected by him at Búðir, Iceland, in the Botanical Museum in Copenhagen.

- These specimens are collected in 1868, and he wrote some article on algae and lichens in 1874 (Hörður Kristinsson, in lit. electr. 29 Nov 1999).
58. *Lecanora cenisia* Ach. as *Lecanora subfusca* Ach. var. *atrynea* f. *Matarengi*, Lapland. July 1863. I.C. No. 51.
 59. *Lecanora cenisia* Ach. as *Lecanora subfusca* Ach. v. *atrynea* et *Lecanora vitellina* Ach. Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 52. Pencil drawing of simple guttulate ascospore – I. Carroll. ‘There are other lichens here’ – T. Jones.
 60. *Lecanora fuscescens* (Sommerf.) Nyl. in Norrl. as *Lecidea fuscescens* Sommf. Alten Valley, Lapland, July 1863. I.C. No. 79.
 61. *Lecanora hypopta* (Ach.) Vain. as *Lecanora varia* Ach. v. *hypopta* Ach. Avasaxa, Lapland, July 1863: I.C. No. 54.
 62. *Lecanora intricata* (Ach.) Ach. as *Lecanora varia* Ach. v. *intricata* Ach. Bodö, Norway. July 1863. I.C. No. 56.
 63. *Lecanora muralis* (Schreb.) Rabenh. as *Squamarina saxicola* (Poll.) Nyl. Quam, Gudbrandsdal, Norway, June 1863 I.C. No. 157.
 64. *Lecanora polytropa* (Ehrh. ex Hoffm.) Ach. as *Lecanora varia* Ach. v. *illusoria* Ach. Mountains. Norway. 1863. I.C. No. 55.
 65. *Lecanora polytropa* (Ehrh. ex Hoffm.) Ach. as 1. *Lecanora varia* Ach. f. 2. *Lecidea atro-alba* Flk. 3. *Lecanora varia* Ach. v. *intricata* Ach. Lapland, July 1863. I.C. No. 57. Pencil drawing of simple guttulate ascospore. – I. Carroll.
 66. *Lecanora symmicta* (Ach.) Ach. as *Lecanora varia* v. *symmicta* Ach. Alten Valley, Lapland, July 1863. I.C. No. 58.
 67. *Lecanora varia* (Hoffm.) Ach. as *Lecanora varia* Ach. Trondhjem, Norway, July 1863. I.C. No. 53.
 68. *Lecidea fuscoatra* (L.) Ach. as *Lecidea fuscoatra* Ach. f. *fumosa* Ach. Trondhjem, Norway, June 1863: I.C. No. 75.
 69. *Lecidea lapicida* (Ach.) Ach. as *Lecidea lapicida* Fr. v. *declinans* Nyl. Lapland, July 1863. I.C. No. 84. Carroll wrote ‘Paraphyses thick, black headed’. ‘I believe identical with Jones Card No. 533 (No. 2) from Braemar. Compare’. Nylander made red ink drawing of three ascospores and annotated the label *Lecid. lapicida* var. *declinans* Nyl.
 70. *Lecidella elaeochroma* (Ach.) M.Choisy as *Lecidea parasema* Ach. Near Sarpsborg, Norway, June 1863. I.C. No. 86. Carroll wrote ‘paraph. filif. hym gel iodo-cær.’
 71. *Lecidella stigmatea* (Ach.) Hertel & Leuckert as *Lecidea parasema* Ach. f. *enteroleuca* Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 87. Carroll wrote ‘paraph. discr. hym. gel. iodo cær.’ and made a coloured drawing of an apothecium cross section. Nylander annotated the specimen ‘*L. parasema* var. *enteroleuca* Ach.’ in red ink.
 72. *Lecidella stigmatea* (Ach.) Hertel & Leuckert as *Lecidea parasema* Ach. v. *enteroleuca* Near Trondhjem, Norway, July, 1863. I.C. No. 88. Carroll wrote ‘paraph. discretis hym. gel. iodo decide cær.’ and made a coloured drawing of an apothecium cross section and three ascospores.
 73. *Lecidella stigmatea* (Ach.) Hertel & Leuckert as *Verrucaria beloniella* Nyl. n. sp. Quam, Gudbrandsdal, Norway, June 1863. I.C. No. 176. *Lecidella stigmatea* Det. R. Haugan 1999. Carroll made pencil drawing of thecium section and three 3-septate

ascospores. The ascospores are of *Arthonia intexta* Almq., but this parasite is scarce in the collection. No 3-septate ascospores were refound in one microscopic preparation (R. Haugan in litt. electr. 1999).

74. *Lecidella wulfenii* (Hepp) Körb. as *Lecidea parasema* Ach. v. *musciicola* Mt. over Kaafjord, Alten, Norway. July. 1863. I.C. No. 89. Carroll wrote 'parah. discr. hym. gel. iodo cær.' and provided a drawing of ascospores.
75. *Lecidoma demissum* (Rutstr.) Gotth. Schneid. & Hertel as *Lecidea atrorufa* Ach. Alten Valley, Lapland, July 1863. I.C. No. 63.
76. *Leproloma membranaceum* (Dicks.) Vain. as *Amphiloma lanuginosa* Fr Alten Valley, Lapland. July 1863. I.C. No. 6.
77. *Leproloma membranaceum* (Dicks.) Vain. as *Amphiloma lanuginosa* Fr South of Norway. June 1863. I.C. No. 7.
78. *Leptorhaphis epidermidis* (Ach.) Th.Fr. as *Verrucaria epidermidis* Ach. v. *grisea* (Schær). Alten Valley, Lapland July 1863. I.C. No. 168. Nylander named the specimen in red ink 'V. epidermidis f. grisea (Schær.)'
79. *Leptorhaphis epidermidis* (Ach.) Th.Fr. as *Verrucaria epidermidis* Ach. South of Norway. June 1863. I.C. No. 178.
80. *Leptorhaphis epidermidis* (Ach.) Th.Fr. as *Verrucaria albissima* Ach. Onska, Swedish Lapland, Aug 1863. I.C. No. 179. Nylander labeled the specimen V. albissima Ach.' in red ink.
81. *Leptorhaphis epidermidis* (Ach.) Th.Fr. as *Verrucaria epidermidis* Ach. & Fungus Torneå, Lapland, July 1863. I.C. [No. 172.] Carroll wrote 'spores miniature' and he inked in two simple arcuate ascospores.
82. *Lichenostigma* sp. as *Arthonia varians* (Dav) ? Alten Valley, Lapland, July 1863. I.C. No. 164. Carroll made a pencil drawing of an octosporous clavate ascus containing ascospores and three soleiform 1-septate ascospores. Nylander disputed the identification with a red 'x'. The host was not identified and the ascomata suggest *Lichenostigma*.
83. *Lobaria scrobiculata* (Scop.) DC. as *Sticta scrobiculata* Ach. Skelefteå, Lapland, Aug. 1863: I.C. No. 98.
84. *Melanelia exasperata* (Ach.) Essl. as *Parmelia exasperata* (Ach) DN. Trondhjem, Norway, July 1863. I.C. No. 109.
85. *Melanelia exasperata* (Ach.) Essl. as *Parmelia exasperata* (Ach) D.N. Alten Valley, Lapland, July, 1863. I.C. No. 110.
86. *Melanelia exasperata* (Ach.) Essl. as *Parmelia exasperata* (Ach) DN. Trondhjem, Norway, July, 1863. I.C. No. 111. Nylander annotated the specimen 'exasperata' in red ink.
87. *Melanelia hepatizon* (Ach.) Thell as *Platysma fahlunense* (L). Churchyard at Torneå, Lapland 1863. I.C. No. 140.
88. *Melanelia hepatizon* (Ach.) Thell as *Platysma fahlunense* (L). Kautokeino, Lapland, July, 1863. I.C. No. 141.
89. *Melanelia olivacea* (L.) Essl. as *Parmelia olivacea* Ach. Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 108.
90. *Melanelia panniformis* (Nyl.) Essl. as *Parmelia saxatilis* Ach v. *panniformis*. Alten Valley, Lapland, July 1863. I.C. No. 118.

91. *Melanelia panniformis* (Nyl.) Essl. as *Parmelia saxatilis* Ach v. *panniformis* Mt. over Nystuen, Romsdal, Norway 7/63. I.C. No. 119.
92. *Melanelia stygia* (L.) Essl. as *Parmelia stygia* Ach. Trondhjem, Norway. July 1863. I.C. No. 121.
93. *Melanelia stygia* (L.) Essl. as *Parmelia stygia* Ach. Matarengi, Lapland, July 1863. I.C. No. 122.
94. *Muellerella pygmaea* (Körb.) D.Hawksw. as *Endococcus erraticus* (Mass) Nyl. on *Lecidea petræa* Fl. Nr. Trondhjem, Norway. July 1863. I.C. No. 181. Carroll provided a pencil drawing which shows one polysporous ascus with about 30 ascospores, and two 1-septate ascospores coloured brown.
95. *Mycoblastus sanguinarius* (L.) Norman as *Lecidea sanguinaria* Ach. Skelefteå, Lapland, Aug. 1853. I.C. No. 160.
96. *Mycoblastus sanguinarius* (L.) Norman as *Lecidea sanguinaria* Ach. Tromsdal, Norway, July 1863. I.C. No. 161.
97. *Mycoporum hippocastani* (DC.) Coppins as *Mycoporum pteleodes* (Ach) Torneå Churchyard, July 1863: I.C. No. 180. 'sp. murali-div. brown' – I. Carroll.
98. *Naetrocymbe punctiformis* (Pers.) R.C.Harris as *Verrucaria Epidermidis* Ach v. *punctiformis* Ach. Kautokeino, Lapland 7/63. I.C. No. 170.
99. *Naetrocymbe rhypona* (Ach.) R.C.Harris as *Verrucaria rhypona* Ach. Skelefteå, Lapland. Aug. 1863. I.C. No. 177. Pencil drawing of two 3-septate ascospores – I. Carroll.
100. *Neofuscelia pulla* (Ach.) Essl. as *Parmelia prolixa* (Ach) Nyl. Trondhjem, Norway, July 1863. I.C. No. 116. Nylander annotated the specimen in red ink: '*P. prolixa*'
101. *Nephroma arcticum* (L.) Torss. as *Nephroma arcticum* (L.) Fr. Avasaxa, Lapland, July 1863. I.C. No. 24.
102. *Nephroma parile* (Ach.) Ach. as *Nephromium laevigatum* Ach. v. *parile* Ach. South of Norway, June 1863. I.C. No. 25.
103. *Nephroma resupinatum* (L.) Ach. as *Nephromium tomentosum* Hffm. South of Norway, June 1863. I.C. No. 26.
104. *Ochrolechia upsaliensis* (L.) A.Massal. as *Lecanora parella* (L.) v. *Upsaliensis* Mt. over Nystuen, Romsdal, Norway, July 1863. I.C. No. 45.
105. *Ochrolechia upsaliensis* (L.) A. Massal. as *Lecanora tartarea* Ach. Alten Valley, Lapland, July 1863, I.C. No. 59.
106. *Ophioparma ventosa* (L.) Norman as *Lecanora ventosa* Ach. Lapland July 1863. I.C. No. 60.
107. *Orphniospora moriopsis* (A.Massal.) D.Hawksw. as *Lecidea coracina* Ach. (*Lecidea atrata* Sm.) et *Lecidea alpicola* Sch Mt. over Kaafjord, Alten, Norway, July/63. I.C. No. 76.
108. *Pannaria pezizoides* (Weber) Trevis. as *Pannaria brunnea* (Sw). Mt. over Kaafjord, Alten, Norway, July 1863. I.C. No. 123.
109. *Parmelia omphalodes* (L.) Ach. as *Parmelia saxatilis* Ach. f. Avasaxa, Lapland July 1863. I.C. No. 117.
110. *Parmelia sulcata* Taylor as *Parmelia saxatilis* Ach v. *sulcata* Tayl. Quam, Gudbrandsdal, Norway, June 1863. I.C. No. 120.

111. *Parmeliopsis ambigua* (Wulfen) Nyl. as *Parmelia ambigua* (Wulf). Alten Valley, Lapland, July, 1863. I.C. No. 105.
112. *Peltigera neckeri* Hepp ex Müll. Arg. as *Peltigera polydactyla* Hffm. Skelehtiä, Lapland, Aug 1863. I.C. No. 28.
113. *Peltigera venosa* (L.) Hoffm. as *Peltigera venosa* Hffm. Quam, Gudbrandsdal, Norway, July 1863. I.C. No. 27.
114. *Pertusaria albescens* (Ach.) M. Choisy & Werner as *Varicellaria* ? Alten Valley, Lapland, July 1863. I. C. No. 97.
115. *Pertusaria bryontha* (Ach.) Nyl. as *Pertusaria bryontha* (Ach) Mt. over Nystuen, Romsdal, Norway. July 1863. I.C. No. 101.
116. *Pertusaria dactylina* (Ach.) Nyl. as *Pertusaria dactylina* (Ach). (*Isidium dactylinum*) Lofty Mt. over Nystuen, Romsdal, Norway, July 1863, I.C. No. 100.
117. *Phaeophyscia ciliata* (Hoffm.) Moberg as *Physcia obscura* (Ehrh). Trondhjem, Norway. July 1863. I.C. No. 134.
118. *Phaeophyscia ciliata* (Hoffm.) Moberg as *Physcia obscura* (Ehrh) v. *ulothrix* Ach. Nr. the Glommen Norway, June 1863. I.C. No. 136.
119. *Phaeophyscia orbicularis* (Neck.) Moberg as *Physcia obscura* (Ehrh). f. Trondhjem, Norway, July 1863. I.C. No. 135.
120. *Phaeophyscia sciastra* (Ach.) Moberg as *Physcia obscura* (Ehrh) v. *lithotea* Ach. Quam, Gudbrandsdal, Norway, June 1863. I.C. No. 137.
121. *Phaeophyscia sciastra* (Ach.) Moberg as *Physcia obscura* (Ehrh) v. *musciicola* Kautokeino, Lapland, July, 1863, I.C. No. 138.
122. *Phaeorrhiza nimbose* (Fr.) H.Mayrhofer & Poelt as *Lecanora nimbose* Fr. Lapland July 1863. I.C. No. 44.
123. *Physcia stellaris* (L.) Nyl. as *Physcia stellaris* (L.) Trondhjem, Norway, July 1863. I.C. No. 133.
124. *Physconia distorta* (With.) J.R. Laundon as *Physcia pulverulenta* Fr. et *Opegrapha varia* f. *pulicaris* Near Sarpsborg, Norway, June 1863, I.C. No. 132.
125. *Platismatia glauca* (L.) W.L. Culb. & C.F. Culb. as *Platysma glauca* (L). Avasaxa Lapland, July 1863. I.C. No. 142.
126. *Pleopsidium chlorophanum* (Wahlenb.) Zopf as *Lecanora chlorophana* (Wahlb). Bodö, Norway, July 1863: I.C. No. 36.
127. *Porpidia crustulata* (Ach.) Hertel & Knopf as *Lecidea contigua* Fr. Nr. Trondhjem, Norway, July 1863. I.C., No. 65.
128. *Porpidia crustulata* (Ach.) Hertel & Knopf as *Lecidea contigua* Fr. Lapland, July 1863. I.C. No. 66. Pencil drawing of 3 simple ascospores & 'Paraph. discr. hymen. gel. cær. apoth. nitens albida, hyp. brown' – I. Carroll.
129. *Porpidia crustulata* (Ach.) Hertel & Knopf as *Lecidea contigua* Fr. Alten Valley, Lapland, July 1863. I.C. No. 67.
130. *Porpidia speirea* (Ach.) Kremp. as *Lecidea confluens* Ach. v. *calcareia* Ach. Trondhjem. No. 64. (Carroll, 1867b: 339). Listed and numbered in Jones' Accessions register (c. 1864) but the specimen has not been uncovered either in the DBN general lichen collection or in the Jones herb.

131. *Protoblastenia siebenhaariana* (Körb.) J.Steiner as *Lecanora calva* (Dicks) *Lecidea rupestris* v. *calva* Ach. Alten Valley, Lapland. July 1863. I.C. No. 35. 'Identical with Jones' No. 553 from Ben Lawers' – I. Carroll.
132. *Protoparmelia badia* (Hoffm.) Hafellner as *Lecanora badia* Ach. Mt. over Nystuen, Romsdal, Norway, July 1863. I.C. No. 34.
133. *Pseudephebe miniscula* (Nyl. ex Arnold) Brodo & D. Hawksw. as *P. lanata* (L). Bodö, Norway, July 1863, I.C. No. 112.
134. *Pseudevernia furfuracea* (L.) Zopf as *Evernia furfuracea* Mn. near Muionvara, Lapland, July 1863. I.C. No. 22.
135. *Pyrenocollema bryospilum* (Nyl.) Coppins ex H.F.Fox and *Biatora vernalis* (L.) Fr. as 2. Verrucaria bryospila Nyl., 1. Lecidea vernalis Ach. Mt. over Kaafjord, Alten, Norway. July 1863. I.C. No. 169. Nylander annotated the packet: '2. Verrucaria bryospila Nyl., 1. Lecidea vernalis' in red ink. There are pencil drawings of two 1-septate and four simple ascospores.
136. *Pyrrhospora elabens* (Fr.) Hafellner as *Lecidea melancheima* Tk. Alten Valley, Lapland, July. 1863. I.C. No. 90. Carroll wrote 'spores simple, paraph non discr Apoth. brown within. hym gel. iodo cær.'
137. *Ramalina capitata* (Ach.) Nyl. in Cromb. as Ramalina polymorpha Ach. v. capitata Ach. Mt. over Nystuen, Romsdal, Norway, July 1863. I.C. No. 23.
138. *Rhizocarpon alpicola* (Anzi) Rabenh. as *Lecidea geographica* (L.) v. *gerontica* Ach? Mt. over Kaafjord Alten, Norway 7/63. I.C. No. 162.
139. *Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr. as *Lecidea atro-alba* Flot. Lapland, July 1863. I.C. No. 72. Watercolour drawing of two 1-septate ascospores; .001 by .00033 intense blue – I. Carroll. '72 + 83 I think too near each other' – T. Jones.
140. *Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr. as *L. atro-alba* Flot. Matarengi, Lapland, July. 1863. I.C. No. 73. Carroll's pencil 'L. atro-alba' was underlined in red ink by Nylander.
141. *Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr. as Lecidea atro-alba Flot. f. Bodö, Norway. July 1863. I.C. No. 74. 'hypoth. fuscesc. paraph discr.' – I. Carroll. Ink drawing of 1-septate ascospore & ' .0008 by .00045 [in] hardly to be called a form of *atro alba* Flot.' – T. Jones.
142. *Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr. as *Lecidea badioatra* Flk. Trondhjem, Norway, July 1863. I.C. Jones wrote '83 and 72 are too near each other.' Carroll prepared ascospores illustration and reported 'hym. gel iodo cær. par. discr.' No. 83.
143. *Rhizocarpon geminatum* Körb. as *Lecidea geminata* Flot. Quam, Gudbrandsdal, Norway, June 1863: I.C. No. 78.
144. *Rhizocarpon obscuratum* (Ach.) A. Massal. as *Lecidea petræa* Flot. Matarengi, Lapland, July 1863. I.C. No. 93. Carroll wrote 'sp. mural. divisæ, dark – br. about 8 in asci, par. vix discr.'
145. *Rhizoplaca chrysoleuca* (Sm.) Zopf as Squamaria chrysoleuca (Sm) Holaker Station, Norway. June 1863. I.C. No. 158.
146. *Rhizoplaca melanophthalma* (DC. in Lam. & DC.) Leuckert & Poelt as Squamaria melanophthalma (Ram). Holaker Station, Norway, June 1863. I.C. No. 159.

147. *Rinodina mniaraea* (Ach.) Körb. as *Lecanora turfacea* v *biatorina* Nyl. Mt. over Kaafjord, Alten, Norway, July 1863. I.C. No. 47. In Nylander's red ink: '*Lecanora turfacea* var. *biatorina* Nyl. (junior) [ascospores dimensions] 0,027-33 [x] 0,016-17 [mm]'
148. *Schaereria fuscocinerea* (Nyl.) Clauzade & Roux as *Lecidea tenebrosa* Flot. South of Norway, June 1863. I.C. No. 95. Nylander wrote name in red ink '*Lecanora tenebrosa* Flot.'
149. *Scoliciosporum umbrinum* (Ach.) Arnold as *Lecidea umbrina* Ach. (*Scoliciosporum holomelænum* Krb.) et *Lecidea petraea* Flot. v. South of Norway. June 1863. I.C. No. 96.
150. *Solorina crocea* (L.) Ach. as *Solorina crocea* Ach. Mt. over Nystuen, Romsdal, Norway, July '63. I.C. No. 99.
151. *Stereocaulon dactylophyllum* Flörke as *Stereocaulon paschale* Laur. South of Norway, June 1863. I.C. No. 30.
152. *Stereocaulon paschale* (L.) Hoffm. as *Stereocaulon paschale* Laur. Kautokeino, Lapland July 1863. I.C. No. 29.
153. *Stereocaulon vesuvianum* Pers. as *Stereocaulon denudatum* Flk. Christiansund, Norway, July 1863. I.C. No. 31. Nylander's '*denudatum*' in red ink was overwritten by Carroll.
154. *Stigidium congestum* (Körb.) Triebel on *Lecanora rugosella* Zahlbr. as *Lecanora subfusca* Ach cum *Sphaeria* Near Sarpsborg, Norway. June 1863. I.C. No. 49.
155. *Strangospora moriformis* (Ach.) Stein as *Lecidea improvisa* Nyl. ! Skelefteå, Lapland, Aug. 1863, I.C. No. 81. Carroll illustrated a cross section of the ascoma in colour and in pencil drew an ascus containing 64 simple ascospores. He noted 'paraph. non discr. hym gel. iodo cær.'
156. *Trapeliopsis granulosa* (Hoffm.) Lumbsch as *Lecidea decolorans* Flk v. *desertorum* Ach. Alten Valley, Lapland, July 1863. I.C. No. 68.
157. *Tuckermannopsis chlorophylla* (Willd. in Humb.) Hale as *Platysma ulophyllum* (Ach). Near Sarpsborg, Norway, June 1863. I.C. No. 145.
158. *Umbilicaria cylindrica* (L.) Delise ex Duby as *Umbilicaria cylindrica* (L). Christiansund, Norway. July 1863. I.C. No. 154.
159. *Umbilicaria hyperborea* (Ach.) Hoffm. as *Umbilicaria hyporborea* Hoffm. Kautokeino, Lapland. July 1863. I.C. No. 147.
160. *Umbilicaria polyphylla* (L.) Baumg. as *Umbilicaria polyphylla* (L.) Schrad. Mt. over Nystuen, Romsdal, July 1863. I.C. No. 152.
161. *Umbilicaria polyrrhiza* (L.) Fr. as *Umbilicaria spadochroa* Ach. ? *sterilis* ? Alten Valley, Lapland, July 1863. I.C. No. 151. Nylander inserted the second '?' in red ink.
162. *Umbilicaria proboscidea* (L.) Schrad. as *Umbilicaria proboscidea* D.C. Trondhjem, Norway, July, 1863. I.C. No. 155.
163. *Umbilicaria rigida* (Du Rietz) Frey as *Umbilicaria proboscidea* D.C. Alten Valley, Lapland, July 1863. I.C. No. 156.
164. *Umbilicaria spadochroa* (Hoffm.) DC. in Lam. & DC. as *Umbilicaria spadochroa* Ach. Near Sarpsvoss, Norway, June 1863. I.C. No. 148.
165. *Umbilicaria spadochroa* (Hoffm.) DC. in Lam. & DC. as *Umbilicaria spadochroa* Ach. Near Trondhjem, Norway, July, 1863. I.C. No. 149.

166. *Umbilicaria spadochroa* (Hoffm.) DC. in Lam. & DC. as *Umbilicaria spadochroa* Ach. Near Trondhjem, Norway, July, 1863. I.C. No. 150.
167. *Umbilicaria torrefacta* (Lightf.) Schrad. as *Umbilicaria erosa* Hoffm. Christiansund, Norway, July 1863. I.C. No. 153.
168. *Usnea barbata* (L.) Weber ex F.H.Wigg. as *Usnea barbata* Fr. f. Skelefteå, Lapland. Aug. 1863. I.C. No. 173.
169. *Usnea filipendula* Stirt. as *Usnea barbata* Fr. v. *dasyopoga* Ach. Avasaxa, Lapland, July 1863. I.C. No. 174.
170. *Verrucaria aethiobola* Wahlenb. in Ach. as *Verrucaria margacea* v. *aethiobola* Ach. Mountains, Norway. 1863. I.C. No. 171.
171. *Verrucaria glaucina* auct. non Ach. as *Verrucaria subfuscella* Nyl. Quam, Gudbrandsdal, Norway, June 1863. I.C. No. 167. Carroll made pencil drawing of two simple ascospores.
172. *Vulpicida juniperinus* (L.) J.-E.Mattsson & M.Lai as *Cetraria juniperina* (L.) *fertile*. Quam, Gudbrandsdal, Norway. June 1863. I.C. No. 13.
173. *Vulpicida pinastri* (Scop.) J.-E. Mattsson & M.J. Lai as *Platysma pinastri* (Scop) Nyl. Haparanda, Swedish Lapland, Aug. 1863. I.C. No. 139.
174. *Xanthoria candelaria* (L.) Th. Fr. as *Physcia lychnea* (Ach) Nyl. Lich. Scand., *Physcia parietina* (L.) v. *lychnea*. Churchyard, Torneå, Lapland, Aug. 1863. I.C. No. 131.
175. *Xanthoria elegans* (Link) Th. Fr. as *Placodium elegans* DC. Quam, Gudbrandsdal, Norway, June, 1863. I.C. No. 125.
176. *Xanthoria elegans* (Link) Th. Fr. as *Placodium elegans* D.C. f. Nr. Quam, Gudbrandsdal, Norway. June 1863, I.C. No. 127.
177. *Xanthoria elegans* (Link) Th. Fr. as *Physcia parietina* v. *ectanea* Ach. Quam, Gudbrandsdal, Norway, June 1863. I.C. No. 130.
178. *Xanthoria parietina* (L.) Th. Fr. as *Physcia parietina* (L). Near Sarpsborg, Norway, June 1863. I.C. No. 128.
179. *Xanthoria polycarpa* (Hoffm.) Th. Fr. ex Rieber as *Physcia parietina* (L) v. *polycarpa*. Haparanda, Swedish Lapland, August 1863, I.C. No. 129.
180. *Xanthoria soredata* (Vain.) Poelt as *Placodium elegans* D.C. Kautokeino, Lapland, July, 1863. I.C. No. 126.
181. *Xylographa parallela* (Ach.:Fr.) Behlen & Desberg as *Xylographa parallela* Fr. S. of Norway, June 1863. I.C. No. 175.

APPENDIX 2**INDEX OF SPECIMEN LOCALITIES IN AN INFERRED
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