



William Mitten, Hurstpierpoint and the bryophytes of the world

Brad Scott describes the wide-ranging studies of this Sussex bryologist

In Victorian botany and natural history it is easy to bring to mind the lives of many of the great collectors who travelled the globe, accumulating cases full of specimens to despatch back to the centre of the Empire. Less well known are those practitioners who often spent years working through the specialist parts of the collections, naming the species and attempting to place them in a wider context.

Over the course of his life, William Mitten (1819–1906) named hundreds of mosses and liverworts from every continent, and developed an extraordinary understanding of global bryophyte distributions. Writing of Mitten shortly after his death, Alfred Russel Wallace asserted that “for a long time [he] was the greatest British authority” on these small plants (quoted

in Anon., 1907).

This article outlines Mitten’s life and botanical work, and was occasioned by a BBS SE Group meeting to his village in May 2019 (Fig. 1).

Born in Hurstpierpoint, where he spent almost his entire life, Mitten (Figs 2, 3) was the son of the butler at nearby Danny House. Apprenticed to a chemist in Lewes, he worked in London for a few years in the early 1840s before returning to his Sussex village where he established himself as a dispensing chemist, which was to be his trade for the rest of his life.

His education and subsequent training introduced him to botany and Latin, and it is likely that he was still a youth when he first came

△Fig. 1. The BBS SE Group visit to Mitten’s house, Treeps, Hurstpierpoint, 5 May 2019.



△Fig. 2. William Mitten in the garden at Treeps. © The Trustees of the Natural History Museum, London (WP/2/1/24).

to know William Borrer (1781–1862); the great Sussex botanist lived only five miles away in Henfield. Much indebted to his teacher, he wrote: “To Mr. Borrer I owe the ability to determine with exactness” and acknowledged how invaluable it was to have access to his herbarium and library. Borrer gave him a microscope and, over time, donated a large number of his books (Holmes, 1907; letters from Mitten to Holmes, Linnean Society, MS/235b).

Mitten’s botanical explorations initially focussed on vascular plants. While working in London, Mitten found several species which resulted in his first notices in *The Phytologist*. In August 1841 he came across *Bupleurum tenuissimum* (Slender Hare’s-Ear) in some

fields north of Highgate, and the same month reported *Atriplex pedunculata* (Pedunculate Sea-Purslane) “growing not very plentifully in the salt marsh about two miles below Gravesend”. May 1843 brought him the first British record of *Carex montana* near Eridge in Sussex, which he subsequently went to look at with Borrer and presented to the Botanical Society of London. A few years later he also discovered *Ludwigia palustris* (Hampshire-purslane) in Cuckfield.

The 1840s were a time of transition in British botany, with William Hooker (1785–1865) being appointed as director of the Royal Botanic Gardens, Kew in 1841, and his long-time bryological collaborator Thomas Taylor dying of fever in 1848 (Sayre, 1987). Hooker’s son, Joseph Hooker (1817–1911), was also developing his botanical career, serving as assistant ship’s surgeon and botanist on HMS *Erebus* on the Antarctic expedition led by James Clark Ross between 1839 and 1843. Conscious that the number of people with sufficient skill and expertise to work with and identify mosses and liverworts was always tiny, the younger Hooker wrote to his father that “in all the Journals of Societies &c that I see, I seldom see the name of any young Botanist”, and adding further that “Mosses appear a dead letter except to Wilson” (7 March 1843, RBG, Kew, JDH/1/2 f.169-175).

William Wilson (1799–1871) had started his bryological studies in about 1826, extensively exploring Cheshire and Lancashire over the following decade (Cash, 1884). When the *Erebus* returned to England, it was Wilson who was engaged to work on the mosses, which were published in *The Botany of the Antarctic Voyage* (1844–1860).

While Joseph Hooker was in the Southern Hemisphere, another young botanist, Richard Spruce (1817–1893), started writing about mosses and liverworts. Like Mitten, he had

developed an interest in plants from an early age, and corresponded with Borrer. A collecting expedition to the Pyrenees and its subsequent publication established his reputation (Seaward, 1996).

Mitten was learning about bryophytes in parallel with Spruce, and in April 1843 found *Aulacomnium androgynum* in fruit in Abbey Wood, Kent (now part of Greater London), and reported a variety of species from Hurstpierpoint in 1845. One example from his herbarium from this time is the type of *Leptodontium gemmascens* on thatch in Hurstpierpoint. By 1846 Borrer himself was sending mosses to Mitten for identification, and had introduced him to William and Joseph Hooker. The following year Mitten became an Associate Member of the Linnean Society.

This burgeoning expertise in the younger generation was timely; in 1848 William Hooker was looking for an assistant for his herbarium at Kew to replace Jules Émile Planchon. He discussed this with his son, who was by then on his Indian expedition. The latter responded “Spruce I am sure you would not get on with — & except Mitten no one seems eligible” (1 February 1849, RBG, Kew, JDH/1/10 f.128-130). This was reiterated in another letter six months later: “Spruce is very clever & all that sort of thing but one wants hard heads & useful men now a days & gov[ernmen]t. pay should be doled out according to the amount of national profit, pleasure or advantage provided by the science to the public in general & not physiologists in particular or philosophers” (6 August 1849, RBG, Kew, JDH/1/10 f.194-196). To get the work done, dedication and focus were required, not hypothesising and speculation; that was Hooker’s job (Endersby, 2008).

Though clearly the preferred candidate, this wasn’t the moment for Mitten, now with a

young family and in the process of taking over a chemist’s business in Hurstpierpoint (Hemsley, 1906).

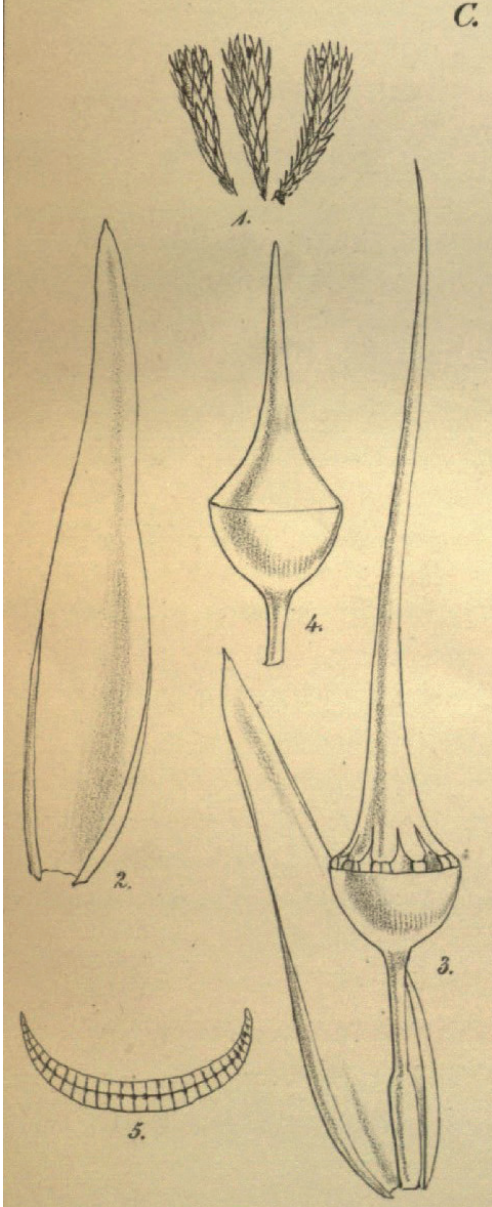
By 1851 Mitten’s bryological skills were bearing fruit, with his first three more substantive publications. The first was ‘Some Remarks on Mosses, with a Proposed new Arrangement of the Genera’, largely following Müller in following the “form of the cells in the leaves” to inform the classification (Mitten, 1851a). In the same year his work on the Sussex bryophytes started to appear, based on his extensive field work, including trips with Borrer. These included *Pottiopsis caespitosa* from Wolstonbury Hill, and *Zygodon forsteri*, probably from near Hastings. Unfortunately for Sussex, he never completed this work, managing only to get through between a quarter and a third of the mosses (Mitten, 1851b).

Though he continued to explore and write about the flora of Sussex, for the rest of his life he received a steady stream, sometimes a tsunami, of

▽ Fig. 3. William Mitten in the greenhouse at Treeps.

© The Trustees of the Natural History Museum, London (WP/15/3/5).





△Fig. 4. Mitten's drawings of *Schistomitrium gardnerianum* (*Ochrobryum gardneri* (Müll. Hal.) Mitt.) from Burma (Mitten, 1856). Biodiversity Heritage Library.

bryophytes from around the world, sent to him for cataloguing, identification and description. Mostly these came via the Hookers at Kew, but over time Mitten's reputation was such that he was being sent specimens directly. The first of the publications arising from this work was also in 1851, on the cryptogams of Quito, which had been collected by Professor William Jameson (1796–1873), a Scottish physician and botanist, who lived in South America for most of his life from 1822.

The next few years brought Mitten work on the mosses of Portugal, as well as the liverworts from Joseph Hooker's Southern expedition, which were published in the volumes for New Zealand (1855) and Tasmania (1860). Further adding to his workload, he contributed accounts for Wilson's section of *The Botany of the Antarctic Voyage* on the Tasmanian mosses, and worked with Churchill Babington on the island's lichens.

The quantity of plants being sent to Hurstpierpoint steadily increased, not least because Wilson became less able to work on the mass of new collections from the colonies. Joseph Hooker was concerned about how to manage this, confessing to Mitten in 1857 that "I fear [Wilson] is in wretched bodily health & worse spirits — he seems to be quite broken down as a Botanist" (13 April 1857, RBG, Kew, MIT f.159).

Mitten's bryological researches and writings were extensive, including a large number of works still heavily used by taxonomists today. It is extraordinary that he managed to achieve this; in business on the High Street for 56 years, for a large part of the time he kept his shop open 15 hours a day (Anon., 1906).

How did he manage to juggle these two parts of his life? In 1854 he suggested to William Hooker that, in fact, he had "a good deal of time to devote to the study of Musci, &c., though it was made up of little bits" (quoted in Hemsley, 1906). Until then he had only been away from Hurstpierpoint for two weekdays in five years, and on one of those he went to see Borrer. His pharmacy and his mosses kept him close to home. This situation barely altered in the following decades; in a letter to the American bryologist Sereno Watson in 1891 he wrote of his botanical work that "I have only the intervals between business matters that sometimes consume all my time and then I get too fagged to do much good"

(10 September 1891, Harvard University Botany Libraries).

Encouraged by Hooker, and with a growing library and large numbers of specimens being added to his personal herbarium, Mitten developed a sense of the variety, similarities and differences of the bryophytes of the world.

In the course of his taxonomic work, Mitten frequently devised new taxa, which was not without controversy. Charles Parish (1822–1897) had sent his first collection of Burmese plants to Kew, which Mitten determined during 1855 (Fig. 4); visiting Sussex, Parish accompanied Mitten on a walk in the woods, but confided to William Hooker that he was dismayed at the “perfectly dreadful” names Mitten used for “old friends” (15 December 1856, RBG, Kew, DC/55/239). And the stacks of specimens steadily built up, with anxious letters being sent to the Hookers about Mitten’s slow progress during the 1860s and 70s from several colonial collectors, including George Henry Kendrick

Thwaites (1811–1882), superintendent of the botanical gardens at Peradeniya, Ceylon, and Richard Beddome in India.

Richard Spruce grumbled even more. He had been in South America between 1849 and 1864, and his voluminous bryophyte collections were also in Mitten’s shop, where he kept all the unprocessed collections he received (Thiers, 1983). Possibly unaware of the sheer number of plants Mitten was receiving, Spruce frequently complained about the number of years Mitten had had them (Seaward, 1996). Finally, to attempt to expedite matters, shortly after Spruce returned to England he took lodgings in Hurstpierpoint and managed to get some help to assemble and mount his specimens.

The experience rankled with Spruce for years. Writing to Matthew Slater in 1892 he remembered: “In 1865 I was almost in despair about the Mosses. Mitten had had them in his hands for some years — I had been in England (mainly at Kew) a year — and still he seemed to

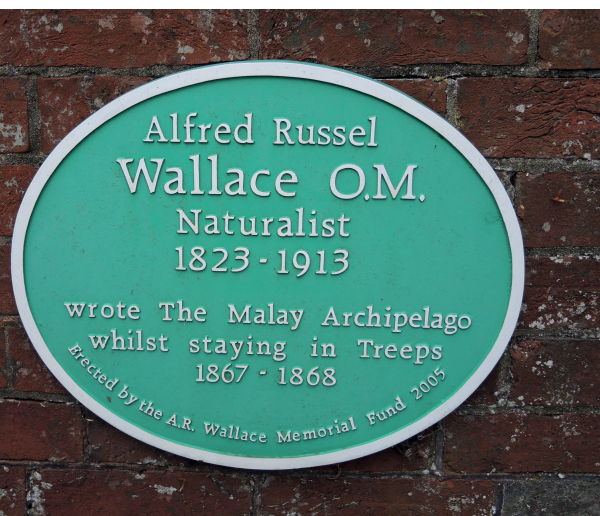
▽ Fig. 5. The Mitten family, most likely in 1867, with Bertie, the first son of Alfred Russel Wallace and Annie (née Mitten).
© The Trustees of the Natural History Museum, London (WP/17/34).



get 'no forrader'. Long frustrated, Spruce griped that "He poses as a sort of Bryological pope — 'such (he seems to say) are my decrees — I shall not condescend to explain them further than suits me, & it is for you to adopt & obey them'" (quoted in Edwards, 1996). Spruce published a short 22 page catalogue of his specimens with Mitten's determinations in 1867, which was followed by what is Mitten's major work, the *Musci Austro-Americani* (1869), comprising 632 pages and largely based on Spruce's collections, supplemented by those from numerous other collectors in south and central America. Spruce's own extensive *Hepaticae Amazonicae et Andinae* finally appeared in 1884–1885.

The context for Mitten's 'slowness' in engaging with Spruce's bryophytes can be readily appreciated if we enumerate the extent and geographical spread of some of Mitten's published work in this period. His range was considerable, with articles on (among others) the flora of Victoria (1856), the Arctic (1857, 1861), India (1857), the 150 page *Musci Indiae Orientalis* (1858), 'Contributions to the Lichenographia of New Zealand' (1862), tropical Africa (1862), Cameroons (1864), the Atlantic Islands (1864), western Canada (1864), and Samoa (1868).

▽Fig. 6. A blue plaque on the wall outside Treeps commemorates Wallace but makes no mention of Mitten. Brad Scott.



These were followed by others on Ceylon (1873), St Helena (1875), Polynesia (1882), Australia (1882), central Africa (1886), and Japan (1891). As William Buck has observed, Mitten "looked at bryophytes in his spare time, [and] changed the face of bryology" (Foreword in Thiers, 1996).

He readily supported and taught local botanists too, identifying *Bartramia stricta*, which George Davies found in Maresfield in 1861, and providing Christopher Parker Smith and, latterly, William Nicholson with encouragement and tuition (Nicholson, 1907). Treeps, his house in Hurstpierpoint, was the focus of a steady stream of visitors, from Sussex, London, and beyond.

Spruce's presence in Hurstpierpoint attracted another visitor to the village, his friend and South American travelling companion Alfred Russel Wallace (1823–1913). The two men were often at Mitten's house, socialising with his family, and in April 1866 Wallace married one of Mitten's four daughters, Annie (Raby, 2002; Figs 5, 6).

Another daughter, Flora, was among the first women to qualify as a pharmacist, and worked with her father in Hurstpierpoint. A benefit of this was that he could occasionally venture further afield on botanical tours, one of which was to north Wales with Wallace in 1867, and which Mitten described in detail in a letter to Spruce (13 October 1867, RBG, Kew, RSP/2/3).

Alongside Wallace, James Hannington (1847–1885) also travelled with Mitten; having grown up in Hurstpierpoint, Hannington developed a keen interest in plants before going into the church. The two visited Killarney in 1880, and Mitten's first continental trip followed the next year when the younger man took him to Switzerland. Hannington subsequently became Anglican bishop of East Africa, and was killed in Buganda in 1885 (Dawson, 1887). Mitten returned to Switzerland in the company of Wallace in 1895 (Wallace, 1905).

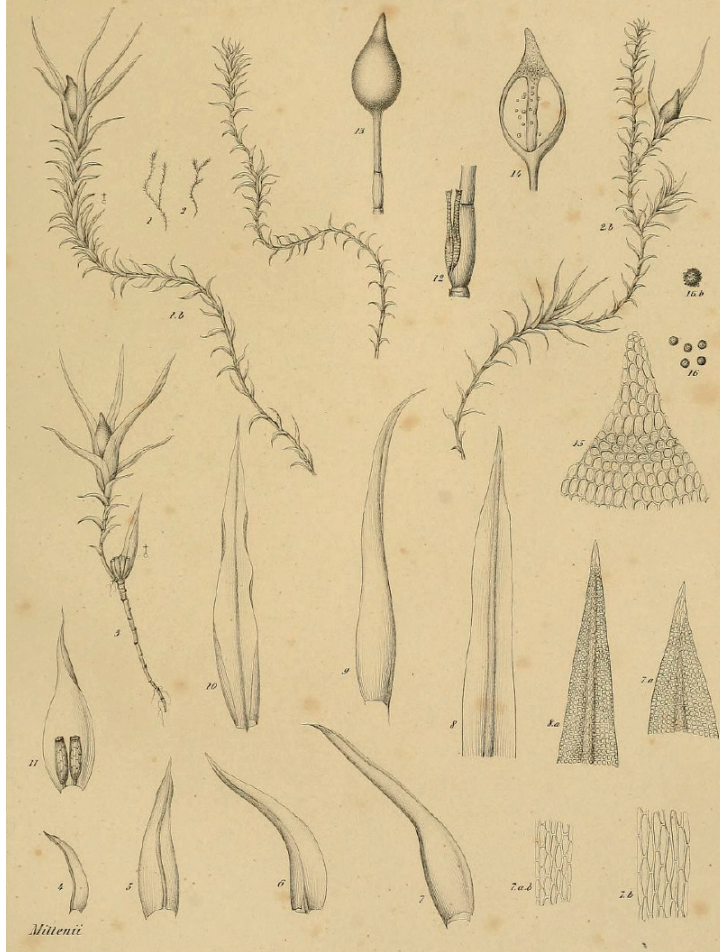


Fig. 7. *Astomum mittenii*, illustrated by Bruch *et al.* (1836), was discovered by Mitten near Hurstpierpoint in 1846, though it has not seen in Sussex since 1920. It is now regarded as a hybrid, *Weissia* × *mittenii* (Bruch & Schimp.) Mitt. (Callaghan, 2019). Biodiversity Heritage Library.

By the end of his life, Mitten's herbarium comprised more than 50,000 specimens and at least 1500 types, and was an extraordinarily important collection of mosses and liverworts, as well as lichens (Fleming & Barneby, 1964; Holmgren *et al.*, 1996); it was later described by Wallace as "the richest (or nearly the richest) private collection of those groups in existence" (quoted in Anon., 1907). Knowing its significance, Joseph Hooker wrote a "private friendly communication" to Mitten in 1885 hoping that Kew could be the future custodian. Other institutions were interested too; Elizabeth Britton of the New York Botanical Garden had visited him in 1891, and wrote five years later to underscore their keenness to make the

acquisition. Ten days after his death a deal was confirmed, and the collection was sold to New York for £400, where it remains today (Thiers, 1983).

For over 50 years Mitten was an invaluable and essential locus in the network of British botany, supported (and paid) by the Hookers at Kew; though others described and named bryophytes in the period, his focussed and broad knowledge of global mosses and liverworts surpassed them all. Even so, he had relatively little interaction with his peers elsewhere in Europe, which resulted in some duplication and synonymy (Foreword in Thiers, 1996). Often criticised for splitting taxa too readily (though, conversely, Benjamin Carrington (1870) complained of "his partiality for condensing species"), Mitten was careful to discriminate difference in what was still a relatively under-developed area of botany. Interestingly, such an approach contrasted with that of his patron Joseph Hooker on the vascular plants (Endersby, 2008).

Mitten is commemorated in the epithets of a number of moss species, including the hybrid *Weissia* × *mittenii* which he discovered near Hurstpierpoint (Fig. 7). Though he rarely travelled (and his journeys were not a material part of his botanical work), his importance to his contemporaries was immense. His painstaking work illustrates the vital part specialist local practitioners played in the Hookers' imperial botanical project.

Acknowledgements

Many thanks to Tim and Alison Moulds for hosting our visit to Treeps. Thanks also to Len Ellis, Anne Secord and Chris Preston for comments on an earlier version of this article, and to Bill Buck for supplying one of the sources.

References

- Anon. (1906).** [Obituary of William Mitten]. *The Chemist and Druggist* 69: 118.
- Anon. (1907).** The Mitten collection of mosses and hepatics. *Journal of the New York Botanical Garden* 8: 28–32.
- Callaghan, D.A. (2019).** Typification and diagnosis of *Weissia* × *mittenii* (Bruch & Schimp.) Mitt. emend. A.J.E.Sm. (*Weissia multicapsularis* × *W. rostellata*) (Pottiaceae, Bryophyta). *Journal of Bryology* 41: 243–248.
- Carrington, B. (1870).** On two new British Hepaticae. *Journal of Botany, British and Foreign* 8: 65–68.
- Cash, J. (1884).** The late Mr. William Wilson: Notes on his early bryological work. *The Naturalist* 9: 202–212.
- Bruch, P., Schimper, W.P. & Gumbel, T. (1836).** *Bryologia europaea, seu, Genera muscorum europaeorum monographice illustrata*. E. Schweizerbart, Stuttgart.
- Dawson, E.C. (1887).** *James Hannington, D.D., F.L.S., F.R.G.S., First Bishop of Eastern Equatorial Africa, A history of his life and work*. Seeley, London.
- Edwards, S.R. (1996).** Spruce in Manchester, in M.R.D. Seaward & S.M.D. FitzGerald (eds), *Richard Spruce (1817–1893): Botanist and explorer*, pp. 266–279. Royal Botanic Gardens, Kew.
- Endersby, J. (2008).** *Imperial nature: Joseph Hooker and the practices of Victorian science*. University of Chicago Press, Chicago.
- Fleming, M. & Barneby, R.C. (1964).** Treasures of the Garden's herbarium III: The bryophytes of William Mitten. *The Garden Journal (New York Botanical Garden)* 14: 146–148.
- Hemsley, W.B. (1906).** William Mitten. *Journal of Botany, British and Foreign* 44: 329–332.
- Holmes, E.M. (1907).** Obituary. William Mitten, A.L.S. *The South Eastern Naturalist* 12: 82–84.
- Holmgren, P.K., Kallunki, J.A. & Thiers, B.M. (1996).** A short description of the collections of the New York Botanical Garden Herbarium (NY). *Brittonia* 48: 285–296.
- Mitten, W. (1851a).** Some remarks on mosses, with a proposed new arrangement of the genera. *The Annals and Magazine of Natural History, Zoology, Botany, and Geology* 8: 51–59.
- Mitten, W. (1851b).** A list of all the mosses and hepaticae hitherto observed in Sussex. *The Annals and Magazine of Natural History, Zoology, Botany, and Geology* 8: 305–324, 363–370.
- Mitten, W. (1856).** A list of some mosses and hepaticae, collected by the Rev. Charles Parish, at Moulmein, and communicated to Sir W.J. Hooker. *Hooker's Journal of Botany and Kew Garden Miscellany* 8: 353–57.
- Nicholson, W.E. (1907).** William Mitten: a sketch with bibliography. *The Bryologist* 10: 1–5.
- Raby, P. (2002).** *Alfred Russel Wallace: a life*. Pimlico, London.
- Sayre, G. (1987).** Biographical sketch of Thomas Taylor. *Journal of Bryology* 14: 415–427.
- Seaward, M.R.D. (1996).** Introduction, in M.R.D. Seaward & S.M.D. FitzGerald (eds), *Richard Spruce (1817–1893): botanist and explorer*, pp. 1–13. Royal Botanic Gardens, Kew.
- Thiers, B.M. (1983).** Index to the genera and species of Hepaticae described by William Mitten. *Brittonia* 35: 271–300.
- Thiers, B.M., ed. (1996).** *Indices to the species of mosses and lichens described by William Mitten*. New York Botanical Garden, New York.
- Wallace, A.R. (1905).** *My life: a record of events and opinions*. Chapman & Hall, London.

Brad Scott
e bradscottuk@gmail.com