

Young²: the palaeobryozoological work of John Young and John Young of Glasgow

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1. Introduction

During the mid-Victorian period Glasgow rapidly developed as a major industrial and cultural centre, the latter activity based largely around the university and various scientific societies. The University of Glasgow houses the significant collections of William Hunter (d. 1783) in the Hunterian Museum, now known as 'The Hunterian' (Brock 1980) and for a period in the nineteenth century these were under the collective care of two scientists, both called John Young (Clark 2008). Both men were active members of the Natural History Society of Glasgow and the Geological Society of Glasgow and served on both councils or as officers, and much of their research was published in their respective journals.

2. Mr (later Dr) John Young

The older John Young (1823–1900) (Figure 1, left) was a geologist and museum

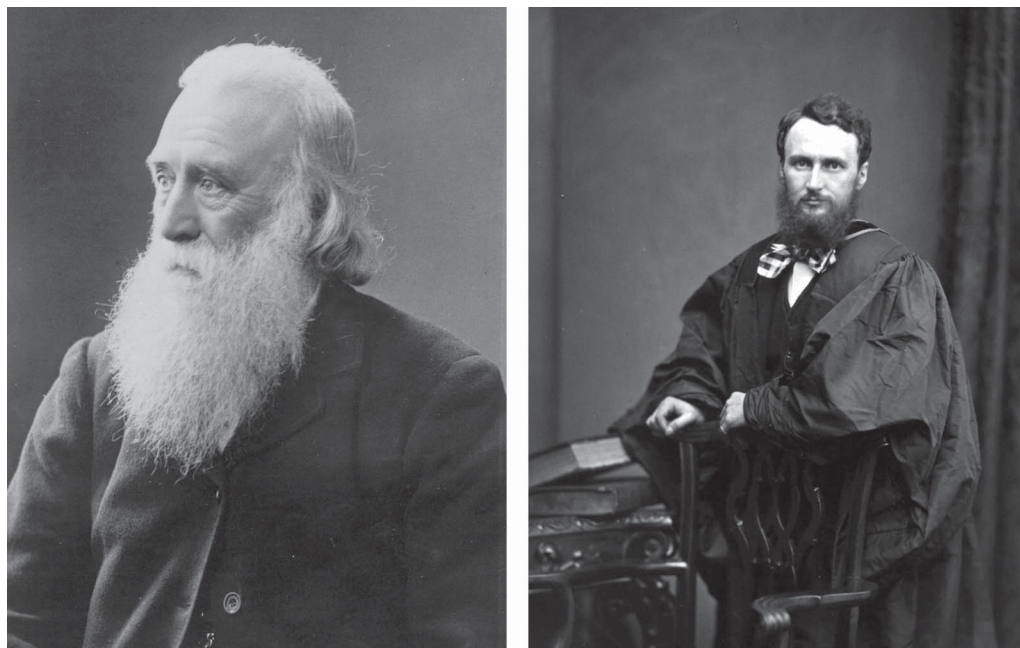


Figure 1. Mr/Dr John Young (left); Prof. John Young (right),

curator who made a significant contribution to the study of fossil bryozoans in the late nineteenth century. Born in Campsie, Stirlingshire, Scotland, he first was employed as a messenger-boy in a textile printing mill and later as an apprentice block cutter in a print works in Lennoxton (Macnair and Mort 1908) where he remained for twenty-six years. At the age of twenty-four he married Margaret Stirling and the couple had seven children, three daughters and four sons (<http://www.hmag.gla.ac.uk/neil/Young/fam003.html>).

Young, who in this paper is referred to with the appellation ‘Mr’ or ‘Dr’, first came to the attention of the scientific community when he joined the Natural History Society of Glasgow in 1852 (he was later elected a Life Member, and a Vice President in 1877). In 1855 he was employed to arrange a fossil collection for the visit to the city of the British Association for the Advancement of Science. Four years later he was appointed as Assistant Keeper in the Hunterian (Figure 2), and during his career which lasted until his retirement in 1899, he did much to enhance the collections, and published several catalogues and listings of Scottish fossils including that coauthored with James Armstrong (1871). This provided the basis of the comprehensive *Catalogue of Western Scottish Fossils* co-authored with Armstrong and David Robertson that contains detailed lists of taxa and locality data and which was published to coincide with the visit of the British Association for the Advancement of Science to Glasgow in 1876 (Armstrong *et al.* 1876) (Figure 3). Professor John Young (1835–1902) (Figure 1, right) penned an account of the geology and palaeontology of the area, and the volume also contains four plates of graptolites from Moffat drawn and lithographed by Charles Lapworth.

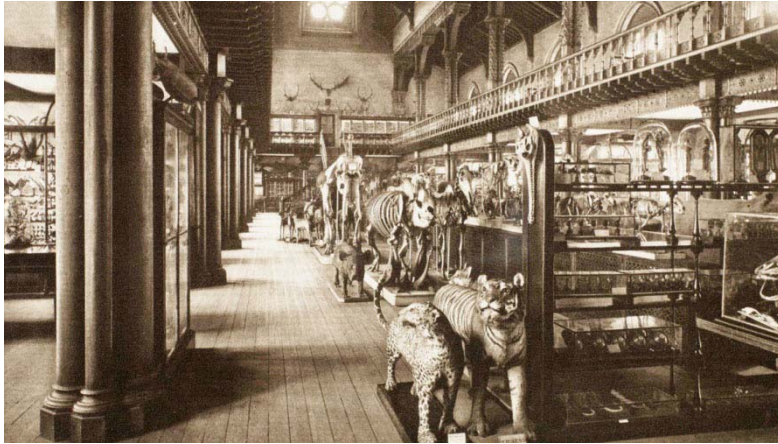


Figure 2. Interior of the Hunterian c. 1890.

While this paper is primarily concerned with the bryozoological researches of these two Scottish naturalists, it should be remarked that Mr John Young produced a significant volume of papers that demonstrated his interest and abilities in groups besides bryozoans or ‘Polyzoa’ as he called them. In an early communication he erected the fossil fish *Rhizodopsis* in 1866.

Young was very closely associated with the activities of the Geological Society of Glasgow, quickly becoming deeply immersed following his election as an Honorary

Associate in 1859 and Vice-President on 6 October of the same year. In addition to chairing meetings in the absence of the President, he frequently exhibited fascinating specimens, led field excursions, and ran an evening lecture course from 1874 until 1882. His status and standing was summarised in 1908 in a description that referred to him with reference to the understanding of the geological structure of western Scotland, as it having “no greater living authority than Mr. John Young” (Macnair and Mort 1908, p. 52). He was also an Associate Member of the Edinburgh Geological Society in whose journal he also published.

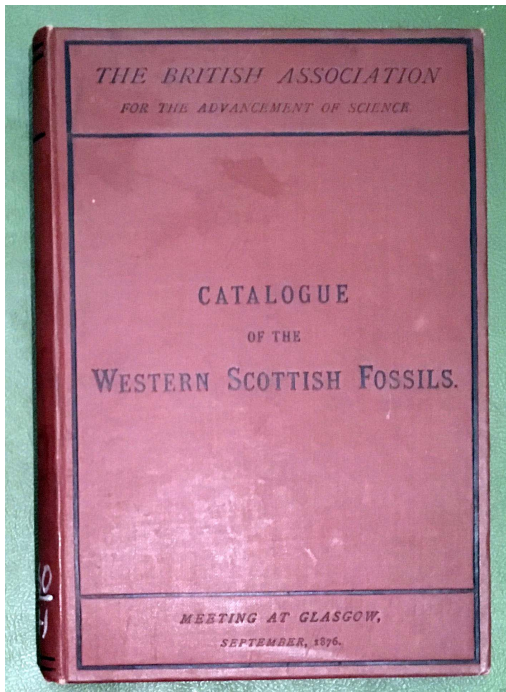


Figure 3. Cover of the handbook Catalogue of the Western Scottish Fossils produced for the British Association for the Advancement of Science meeting in Glasgow in 1876.

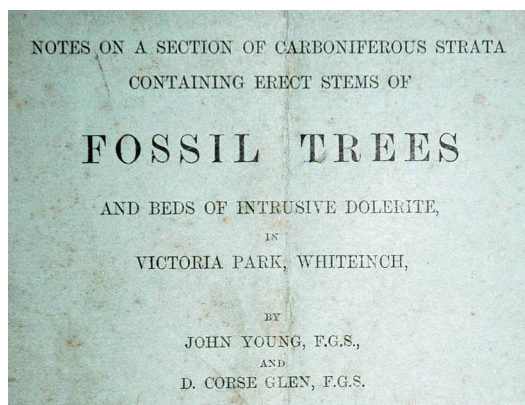


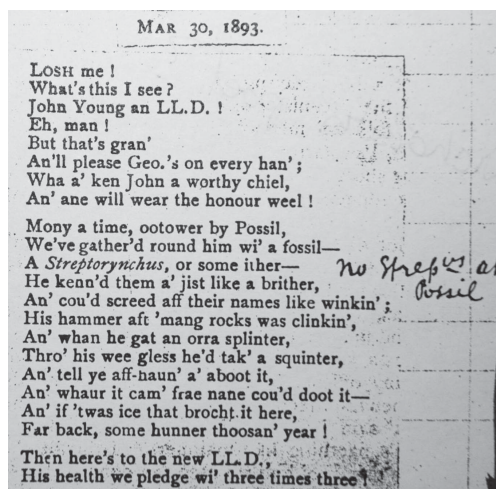
Figure 4. Cover page of pamphlet by John Young and David Corse Glen on the geology and palaeobotany of Victoria Park, Glasgow (1888) (left); View of the aptly named Fossil Grove, Victoria Park, Glasgow prior to the erection in 1890 of the pavilion that now projects the site (right).

In 1887 a group of unemployed shipbuilders were provided with work clearing out an old quarry in Victoria Park, and they came across a number of bases of *Lepidodendron* trees *in situ* (Figure 4, right). This find and its geological setting and palaeobotanical significance was described in two papers the following year, one by Young and Corse Glen (1888) (Figure 4, left) and the other by the eminent palaeobotanist Robert Kidston (Gunning 1995, Kidston 1888, www.hmag.gla.ac.uk/neil/FossilGrove/). Fossil Grove is most likely the earliest geoconservation site in the world.

Towards the end of his life he was conferred LL.D. by the University of Glasgow and this was greeted with great acclaim by his associates one of whom published a short poem to mark the event (Figure 5). His new title also later helped others distinguish him from his younger namesake. In publications he is often referred to as “Mr John Young” and was known locally as “John Young, the Good” on account of his careful scientific work. He was reputed to be a good teacher and always willing to help students and fellow naturalists particularly in the field, and was generous in the distribution of materials that he had collected.

He died on 13 March 1900 at Troon, Ayrshire.

Figure 5. Poem published in 1893 celebrating the conferring of the degree of LL.D. on Mr John Young. A hand-written note on the right remarks that the fossil brachiopod *Streptorynchus* is not actually found at Possil which is a district in north Glasgow.



3. Professor John Young

The younger John Young (1835–1902) (Figure 1, right) was educated at the University of Edinburgh where he qualified with a medical degree. Following a short medical career at the Royal Edinburgh Asylum, he joined the Geological Survey in Scotland and served as a geologist between 1861 and 1866. While on fieldwork he broke his kneecap which left him slightly lame for the rest of his life (Macnair and Mort 1908, p. 211)

In 1866 Young was appointed Professor of Natural History in the University of Glasgow in succession to the American geologist Henry Darwin Rogers and took up the concurrent position of Keeper of the Hunterian. As a lecturer he was never dull and was memorable for being irrational and blessed with a sardonic wit, and was widely known for his unconventional behaviour (Macnair and Mort 1908, Cleavelly 1983). He promoted the educational value of the museum, but came into conflict with some of his colleagues when he suggested that the collection of coins be sold as they were not used for teaching.

Given his academic position it is not surprising that he was elected President Geological Society of Glasgow, 7 March 1867 and served until 1872. He was also President of the Natural History Society of Glasgow from 1869 to 1882.

Aside from his scientific research in palaeontology and glacial geology he also published a catalogue of the artworks in the University (1880) and his *Essays and Addresses* were published posthumously in 1904 (Llowlees 1904)

He was distinguished from his namesake by the title “Prof.”, letters “M.D.” or the less complimentary “John Young, the Bad”. The latter may have to do with his unconventional and eccentric behaviour, or simply because it was opposite to the older John Young.

4. Bryozoan research

In a four-year period from 1874 to 1877 John Young and John Young jointly published a series of eight short papers on Scottish Carboniferous Bryozoa (Appendix 1).

Much of this material was collected at various localities in the west of Scotland: Capelrig, Boghead - Hamilton, Gillfoot, Hairmyres, High Blantyre, and Trearne. Of these, Hairmyres yielded exquisitely preserved bryozoans, most of which comprised delicate zoaria such as in the genera *Penniretepora* and *Diploporaria* (Figure 6). The locality, adjacent to the East Kilbride Railway line, had been known to the Scottish naturalist and cleric David Ure (1749–1798) (Clark and Keen 1996, Clark 2015).

Young and Young named several new cryptostome and fenestrate genera: *Rhabdomeson* and *Actinostoma* in 1874, *Diplopora* [now *Diploporaria* Nickles & Bassler, 1900] and *Acanthopora* [now *Penniretepora* d’Orbigny, 1849] in 1875, and a suite of *Penniretepora* species among others (Table 1).

Their papers provided detailed treatments for the time of bryozoan taxonomy and are notable in that attention was paid to aspects of minute skeletal morphology, and for the use of thin sections. They erected the cryptostome genus *Rhabdomeson* on the basis of its distinctive central tubular axis (Figure 7). Although their descriptions are based on

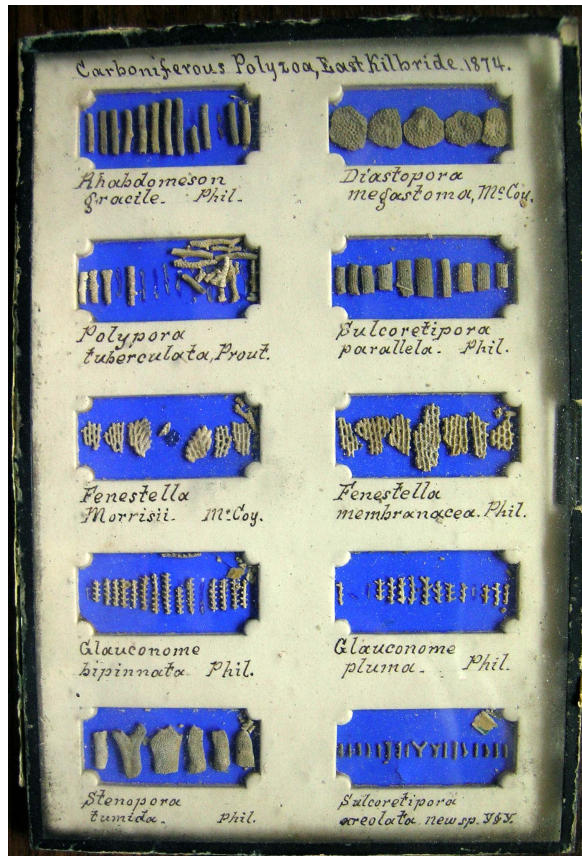


Figure 6. Various Mississippian bryozoans from the Lower Limestone Group, Hairmyres, East Kilbride, Scotland collected, mounted and labelled by John Young in 1874 and presented to David Sanderson. All taxa have since been reassigned. GLAHM 163005, Hunterian Collection.

specimens they collected from Hairmyres in East Kilbride and Trearne in Ayrshire, they perversely selected the species *Millepora gracilis* Phillips, 1841 from the Devonian of north Devon as the type species. During a subsequent revision of the genus, the type specimen of the type species described by Phillips (1841) was found to lack the central axis and so did not belong to *Rhabdomeson* (Wyse Jackson and Bancroft 1995). It was replaced as type species by *Rhabdomeson progracile* Wyse Jackson and Bancroft, 1995 (ICZN 1996) which had been erected and described in detail on the basis of Young and Young's material and other specimens collected throughout Britain and Ireland (Wyse Jackson and Bancroft 1995).

Diplopora was distinguished on account of an accessory pore located just proximally of the autozooeal aperture (Young and Young 1875a) and was first regarded by them as a subgenus; it was later elevated to generic status by Nickles and Bassler (1900) and named *Diploporaria* on account of *Diplopora* being preoccupied. Recognising such a tiny morphological feature (the accessory pore) without the aid of a Scanning Electron

Table 1. New bryozoan taxa described by Young and Young or by Mr John Young

Genera:

- Actinostoma* Young and Young, 1874
Acanthopora Young and Young, 1875
 = *Penniretepora* D'Orbigny, 1849
Diplopora Young and Young, 1875
 = *Diploporaria* Nickles and Bassler, 1900
Rhabdomeson Young and Young, 1874 (Figure 7)
Tabulipora Young, 1882

Species:

- Actinostoma fenestratum* Young and Young, 1874
Glaucanome aspera Young and Young, 1876
 = *Penniretepora pluma* (Phillips, 1836)
Glaucanome elegans Young and Young, 1876 (Figure 8)
 = *Penniretepora elegans* (Young and Young, 1876)
Glaucanome flexicarinata Young and Young, 1876
 = *Penniretepora pluma* (Phillips, 1836)
Glaucanome laxa Young and Young, 1876
Glaucanome (Diplopora) marginalis Young and Young, 1875
 = *Diploporaria marginalis* (Young and Young, 1875)
Glaucanome retroflexa Young and Young, 1876
 = *Penniretepora pulcherrima* (M'Coy, 1844)
Glaucanome recticarinata Young, 1881
 = *Penniretepora recticarinata* (Young, 1881)
Glaucanome robusta Young and Young, 1876
 = *Penniretepora pulcherrima* (M'Coy, 1844)
Glaucanome stellipora Young and Young, 1874
 = *Penniretepora pluma* (Phillips, 1836)
Glaucanome (Acanthopora) stellipora var. *spinosa* Young and Young, 1875
 = *Penniretepora recticarinata* (Young, 1881)
 ?*Sulcoretepora robertsoni* Young and Young, 1877
 = probably *Hyphasmopora* sp.
Synocladia (?) *fenestelliformis* Young, 1881 (Figure 9)
 = *Polyfenestella fenestelliformis* (Young, 1881)
Synocladia? *scotica* Young and Young, 1878
 = *Septopora scotica* (Young and Young, 1878)
Thamniscus? *rankini* Young and Young, 1875
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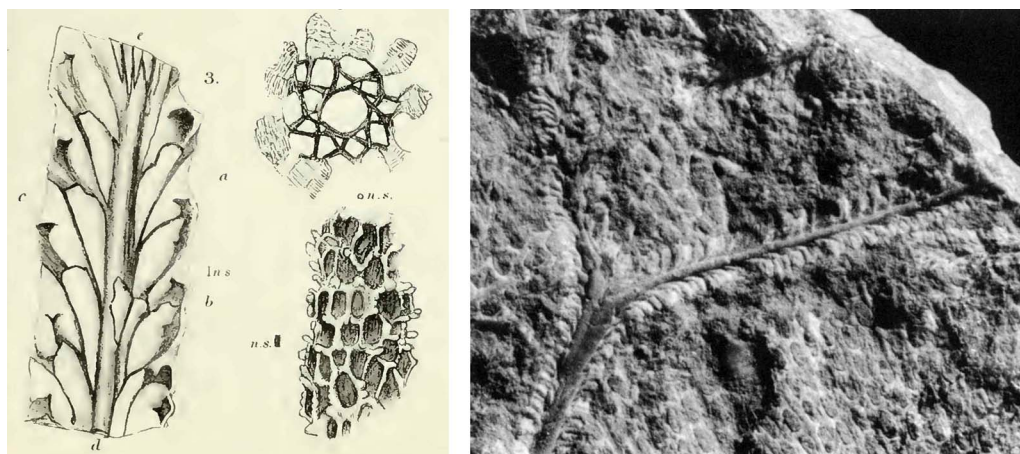


Figure 7. Morphology of *Rhabdomeson* showing longitudinal and transverse sections and external features (from Young and Young, 1874) (left); *Rhabdomeson pro gracile* Wyse Jackson & Bancroft, 1995; GLAHM D.101; from the Mississippian limestone of Laigh Baidland, Dalry, Ayrshire, Scotland. The colony has been split at the depth of the central cylindrical tube to reveal the autozoecial chambers budded away from it (right).

Microscope is a testament to the careful and meticulous work of the Glaswegian bryozoologists.

A number of new species of *Glauconome* (now *Penniretepora*) (Figure 8) were described in several papers and a comparative table listing the morphological characteristics of them and other *Glauconome* species appeared in Young and Young (1875a).

They were the first researchers to describe and illustrate apertural stylets in fossil bryozoans (Young and Young 1874a). These produce a stellate autozoecial opening in some fenestrate species such as *Actinostoma fenestratum* Young and Young, 1874 (see McKinney and Wyse Jackson 2015, figure 32). These apertural stylets demonstrate that the polypide possessed only eight tentacles in its lophophore.

In 1869 Duncan and Fletcher erected the genus *Palaeocoryne* for what they believed to be hydroids found preserved attached to Carboniferous fenestrellid colonies. On closer examination Young and Young (1874d) were able to demonstrate that these were skeletal outgrowths of the bryozoans and not epiphytes, a conclusion subsequently confirmed by later authors (Tavener-Smith 1973, Bancroft 1988, see McKinney and Wyse Jackson 2015, pp. 29–30, fig. 19.6–19.9). At the meeting in London where the paper was delivered Duncan objected to the conclusions stating that he held to his opinion that the outgrowths were parasitical and such skeletal extensions were unknown in modern bryozoans. The extensions probably provided structural support for colonies that enabled them to remain upright in strong water currents.

After 1877 the Youngs, it would appear, didn't publish again collaboratively, and this could be considered surprising for two reasons: firstly, they produced a number of excellent papers prior to 1877, and secondly Mr John Young continued his interest in



Figure 8. Penniretepora elegans Young and Young, 1875, reverse surface showing pinnate growth habit comprising a main stem from which secondary lateral stems develop, some of which bear tertiary pinnae, GAGM 01-53wg; Brigantian, Viséan, Mississippian; Dykehead Pit, High Blantyre, Scotland.

bryozoans and other microorganisms and published until shortly before his death (Appendix 2 and 3). Why might this have been? One can only speculate, but the hierarchy in the Hunterian might have played a part. Perhaps Mr John Young was largely responsible for the joint papers but felt Prof. Young should be credited as the lead author as he was the Keeper of the Hunterian; perhaps Prof. John Young's interest in palaeontology fell away at the time (and this is backed up by examination of the *Royal Society Lists of Scientific Papers* for 1902); or maybe they had a serious falling out. Certainly there is no disputing their hierarchy: in the forward to Prof. Young's 1880 catalogue of the College artworks he asks that readers direct any errors not to himself but to Mr John Young who was charged with compiling these errors for rectification in any future edition of the catalogue. This suggests that the author considered such editorial matters beneath his status in the University.

Whatever the ongoing relationship between the two Hunterian colleagues, between 1874 and 1888 Mr John Young also published at least fifteen bryozoological papers on his own account (Appendix 2). In 1877 he devised a clever preparation method that allowed for the study of the obverse surfaces of fenestrates preserved in shales (Figure 9A). This involved painting a layer of hot asphalt on the exposed reverse surface of the colony and then sticking down brown paper on top. Once cooled the paper could be ripped away and often the hidden obverse surface would be released from the surrounding matrix.

There is no doubt that Mr John Young was a very careful observer and recorder of detail. In his paper of 1882a he observed hemisepta, delicate intrachamber skeletal

structures in some taxa (Young 1882a). In the same paper he also described ‘cell-pores [autozooeical apertures]...covered by a thin calcareous disc or diaphragm pierced in the centre by a very minute pore...’ in four species in three genera. The latter are now known to be Secondary Nanozooeia (see Bancroft 1986b).

In 1882 he erected the trepostome subgenus *Tabulipora* and selected as the species *Cellepora urii* Fleming, 1828 named in honour of David Ure. *Tabulipora* Young, 1882 is now considered to have full generic status and is characterised by the development of ring septae in the exozone (see Wyse Jackson 1996 for description of the type species and two others from Britain and Ireland).

This research provided information on the taxonomy, stratigraphic ranges and geographical distribution of over fifty species in at seventeen genera from the Carboniferous sequences in Scotland (see Armstrong *et al.* 1876, pp. 46–48 for a list of these taxa).

Since the 1970s many of Young and Young’s taxa have been subject to restudy. Graham (1975) revised the pinnate *Penniretepora* species, and Bancroft (1984) carried out an extensive reappraisal of Scottish stenolaemate bryozoans as part of a Ph.D. study. He subsequently published a revision of *Synocladia* (Bancroft 1987) and erected the new genus *Polyfenestella* based on the type suite of *Synocladia* (?) *fenestelliformis* Young, 1881 (Bancroft 1986a) (Figure 9). Later Wyse Jackson and McKinney (2013) carried out

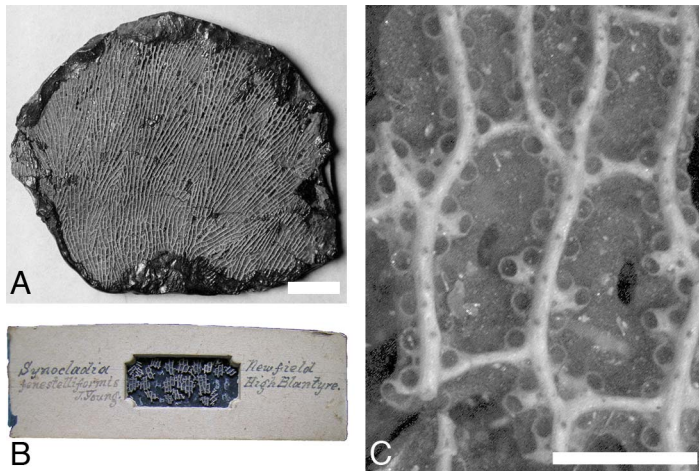


Figure 9. *Polyfenestella fenestelliformis* (Young, 1881); (A) GAGM 01-53xl, lectotype; Brigantian, Viséan, Mississippian; Dykehead Pit, High Blantyre, Scotland. Zoarium showing reticulate meshwork composed of thin dichotomising branches. The obverse surface was revealed by John Young using his asphalt methodology of preparation. Image ©CSG CIC Glasgow Museums Collection; (B-C) GAGM 01-53xj, paralectotype; Brigantian, Viséan, Mississippian; Newfield, High Blantyre, Scotland, (B) Cavity slide containing numerous fragments. This is labelled in the distinctive handwriting of Mr John Young, (C) Obverse surface showing bifurcating branches with strong keel, regular keel nodes, triangular to rectangular fenestrules and thin dissepiments. Scale bars: A = 10mm, C = 1mm (Modified from Wyse Jackson and McKinney 2013, figure 1).

CT microtomography on Young's material and were able to clarify the nature of the polymorphs originally identified as "irregular supplementary cells" by Young (1881, p. 33) and defined as of one of the two distinctive types by Bancroft (1986a).

Synocladia? scotica described by Young and Young in 1878 has gone through a turbulent taxonomic history. Graham (1975, p. 10) placed it in synonymy with *Lanarkopora carbonaria* (Etheridge jr., 1873), but Bancroft (1987, 1989) disagreed with the reasoning for the erection of the genus *Lanarkopora* Graham, 1975 (which Graham 1989 refuted), and showed that *scotica* was a junior synonym of *Synocladia carbonaria* Etheridge jr., 1873 but that the species belonged in the genus *Septopora* Prout, 1859.

John Young's final bryozoan paper is a discussion of rare ctenostome bryozoans from the Carboniferous of Scotland. This paper followed his exhibiting the material at a meeting of the Geological Society of Glasgow in May 1894 (Young 1894).

5. Recognition

Within the local scientific and geological community both Professor and Mr John Young made major contributions both in terms of scientific output but also in providing service. As is noted earlier both served on the Council of the Geological Society of Glasgow culminating in terms as President or Vice President.

When Mr John Young was appointed a Lecturer in the Glasgow Mechanics' Institution in 1874 (a position he held concurrently with his post in the Hunterian) his peers presented him with a life membership of the Geological Society of London and a purse of sovereigns (Macnair and Mort 1908). This no doubt would have been of great value to him in his continued research and lecturing career; membership of the London organisation was often beyond all but those with considerable means.

Nine years later he was honoured by the Geological Society of London in being selected the recipient of the Murchison Geological Fund. This is a secondary award after the Murchison Medal funded from a bequest by the Scottish Geologist and Director of the Geological Survey of Great Britain Sir Roderick Impey Murchison (1792–1871). The citation makes clear John Young's achievements: "the value of his long-continued researches on the fossil Polyzoa, especially those of the western part of Scotland, and of his investigations into the structure of the shells of the Carboniferous brachiopods." Young was not in attendance to receive the award from the President of the society, John Whitaker Hulke, but it was later passed onto him. On Young's behalf Professor John Morris read a letter by way of a response to the President and this clearly demonstrates Young's humility but satisfaction at the unexpected award (Young in Hulke 1883, pp. 32–33). He highlighted his microscopic investigations of fossils and remarked that they are better preserved than many other researchers had otherwise suggested. This painstaking study allowed him to be "fortunate in discovering some new forms, and also in finding some new points of structure in others already known and described."

Aside from his own research, which Morris noted had resulted in nearly fifty papers, John Young wrote that he had gained "sufficient reward" in helping eminent palaeontologists

in their researches through providing specimens of brachiopods, foraminifera, molluscs, sponges, ostracods and from Scotland. No doubt he was referring among others to Thomas Davidson who named the brachiopods *Productus youngianus* and *Rhynchopora youngii* and to Rupert Jones who named the ostracod *Esteria youngii* all in his honour (*Esteria youngii* was revised by Wilson (1958) as the bivalve *Sanguinolites cf. clavatus* which also synonymised Kobayashi's *Lioestheria youngi*). Other taxa named for him included the gastropod *Pleurotomaria youngiana* Armstrong, 1868, the shark *Gyracanthus youngii* Traquair, 1883, and a species of the ctenostome bryozoan *Ascodictyon* named by George Robert Vine in 1891 from the Hairmyres Limestone. It is more than probable that Young sent him the material, as he later sent more specimens just before Vine's death in 1892 (Young 1894, p. 145). That he shared his bryozoan material with a colleague publishing on the same group demonstrates his generosity of spirit and keenness to advance scientific knowledge.

6. The Youngs' bryozoan collection

The bryozoan collections are now housed largely in the Hunterian and in the Glasgow Art Gallery and Museum, Kelvingrove, while a small number are located in the Natural History Museum, London. Beautifully mounted in cavity slides, their provenance is easily verified on account of the distinctive handwriting of Mr John Young (Figures 6 and 9B) who was probably responsible for the curation of the material on which the two men researched. Cleevely (1983, p. 321) remarks that "Young's specimens are notable for their meticulous labels, giving details of horizon, locality and even the date of collection."

In April 1870 Professor John Young exhibited a model of the anatomy of a bryozoan to a meeting of the Natural History Society of Glasgow. This had been made for the Hunterian by a Mr Fenwick.

The Hunterian contains a considerable collection of Carboniferous fossils from Glasgow and adjacent districts collected by Young between 1863 and 1894 (Cleevely 1983). This is not unusual as they were probably collected while engaged in museum and university business. However, given his curatorial position it is odd that his collections are split between two Glasgow institutions. This came about because following his death Mr/Dr John Young's considerable personal collection was acquired by James T. Tullis of Rutherglen, and it was donated by him to the Glasgow Art Gallery and Museum in 1901 (Doughty 1981, Stace *et al.* 1987). Other Young material came via donation by Young himself and John R.S. Hunter-Selkirk (1835–1898), and by Arthur Pratt (1817–1881) and by purchase in 1896 from the estate of David Corse Glen (1824–1892). The collection comprised bryozoans, ostracods, small molluscs, sponge spicules, thin sections of shell microstructure and brachiopods (Cleevely 1983). Stace *et al.* (1987, p. 371) commented that: "Young's collection is the most important collection in the Museum. It formed the basis of the 'Catalogue of Western Scottish Fossils'...".

Professor John Young donated Carboniferous fossils from Glasgow and Australia to the Hunterian (Stace *et al.* 1987), ostracods to the Natural History Museum, London in

1862 and followed this up with specimens of specimens of *Rhabdomeson gracile* in 1874 (Cleevely 1983) shortly after the publication of this taxon. That he distributed specimens beyond Glasgow suggests that he must have considered this bryozoan to have significant scientific importance. Other Young and Young specimens found their way into the collections of the Natural History Museum in London via George Robert Vine (Buttler *et al.* 2002, Wyse Jackson *et al.* 2003).

7. Conclusion

During the late nineteenth century in Great Britain a number of researchers made significant contributions to the naming and understanding of the morphology of fossil bryozoans. Foremost amongst these was Mr (later Dr) John Young who with Professor John Young worked in the Hunterian of the University of Glasgow. Either collaboratively or alone they described over a dozen new species and five genera from the Carboniferous of Scotland.

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