

‘Smiths’ in Bryozoology

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1. Introduction

A search through the extensive reference lists of the Bryozoa Home Page (Bock 2014) and earlier compendia (such as Nickles and Bassler 1900) finds more than 75 papers that have at least one author or editor identified as Smith, Schmidt, Smitt, Smythe, or a hyphenated name with Smith in it. A survey of IBA publications to date reveals that no other name is as common (though there are a number of replicated names such as Brown, Moore, Morris, Turner, and Yang). There are at least 15 Smith and Smith-variant authors published in the bryozoological literature, of whom five have published on bryozoans over several years or more. How can bryozoologists keep track of all these Smiths? Even in the age of Google Scholar, name-confusion is common, as anyone with a common surname who tries to keep track of their own citations can attest. Here we identify and describe each bryozoologist Smith and review his/her publications for ease of reference and to avoid future confusion.

2. Smithian contributions to bryozoology

A number of Smiths *s.l.* have had only a tangential relation to bryozoans, but in the interests of clarity and completeness, they are listed here in alphabetical order. In most cases all the information in each paragraph is a matter of public record and available on the internet.

Percy William Bassett-Smith (1861-1927) was a surgeon in the British Royal Navy who sailed on the *HMS Rambler* to the China Sea and collected bryozoans. They were identified, figured and described by Kirkpatrick (1890). Bassett-Smith was later knighted.

It is said that he preferred advancing science in the navy than service at sea.

Brigitta M. Schmid attended the IBA meeting in Paris (1989), and published a paper in the proceedings outlining a fauna from the Miocene of Nußdorf, Austria (Schmid 1991). At that time she was based at the Institut für Paläontologie in Vienna, and published on other fossil groups such as urchins.

Ferdinand Schmidt published a paper in 1885 or 1886 (reports vary) on freshwater bryozoans of Livonia, a region in modern-day Latvia and Estonia (F Schmidt 1885).

Carl Friedrich Schmidt (1832-1908) was a geologist from St Petersburg, Russia who studied and worked there and later in Tartu, Estonia. He led many expeditions in the 1850s and 1860s, concentrating on lower Paleozoic fossils of Africa. He is remembered for setting up the overall stratigraphic scheme for the Cambrian, Devonian and Silurian Periods (Kaljo 1958). His 1858 paper on the Silurian of the Baltic mentioned several bryozoans (CF Schmidt 1858).

Daniela N. Schmidt attended the University of Bremen, Germany and then received her PhD from ETH Zurich, Switzerland. She is now Professor of Palaeobiology at the University of Bristol, specialising in the effects of climate change and ocean acidification on ecology and evolution of marine organisms. Bryozoans are among the taxa she uses to identify such effects (Raggazola *et al.* 2014).

Oscar Schmidt published two papers (the later one of which was translated into English) in which he discussed and described some species of the solitary Entoproct *Loxosoma* (Schmidt 1876, 1879).

Rolf Schmidt (b. 1972) (Figure 1) was born in Freiburg, Germany, and later emigrated to Australia. He completed his BSc (Hons) and PhD in Geology at the University of Adelaide, Australia in 2003. He has been employed as Collection Manager of Invertebrate Palaeontology at Museum Victoria from 2002 to the present.

Schmidt's publications on Australian bryozoans include ecological adaptations (Brown *et al.* 2002) paleoenvironments and assemblages (Schmidt and Bone 2002, 2003, 2004, 2005, 2007, Schmidt and Gallagher 2014). His most cited paper (Google Scholar) is that in which he and Yvonne Bone described the new genus *Nudicella* (Schmidt and Bone 2004). In addition to attending IBA meetings from 2001 onwards, and many southern hemisphere Australarwood meetings, Schmidt has served on council and as 'webmaster' to the association. He was the main host of the 17th IBA Conference in Melbourne in 2016.

Abigail Marion Smith (b. 1961) (Figure 2) comes from Massachusetts. She studied geology and biology at Colby College in Maine, graduating in 1982, then Earth Science at the Massachusetts Institute of Technology (1984), and finally achieved her doctorate



Figure 1. Rolf Schmidt

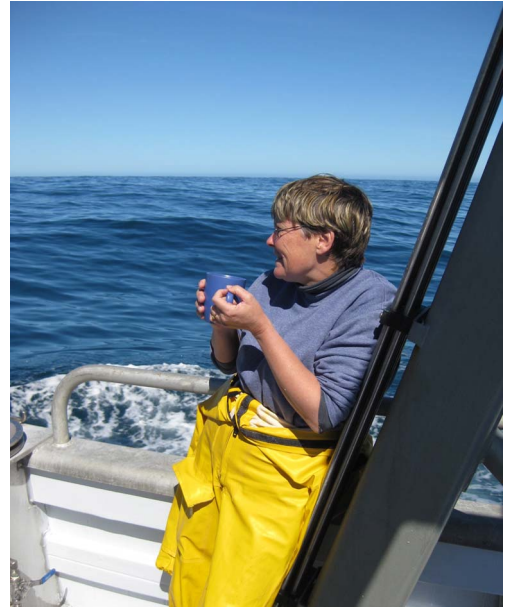


Figure 2. Abigail M. Smith

at the University of Waikato, Hamilton, New Zealand in 1992. She has worked at the University of Otago (Dunedin, New Zealand) since 1993 and has served as the Head of Department of Marine Science and Professor there.

Smith's primary interest is in skeletal composition (Smith and Nelson 1993, AM Smith *et al.* 1998, 2004, 2006, Smith and Key 2004, Smith and Garden 2012), but she has also published on growth and calcification rates in bryozoans (Smith and Nelson 1994a, AM Smith *et al.* 2001), on taphonomic processes and paleoenvironmental interpretation in bryozoan sediments (AM Smith *et al.* 1992, Smith and Nelson 1994b, 1996, AM Smith 1995,) and on wider sea-water chemistry implications (Key and Smith 2003; AM Smith 2014). She has also dabbled in taxonomy (AM Smith 2008a, AM Smith *et al.* 2008, AM Smith *et al.* 2012), control of freshwater bryozoan infestations (AM Smith *et al.* 2005), and historical studies (AM Smith 2008b; AM Smith *et al.* 2014). She has published several bryozoan papers jointly with her research students (e.g., Steger and Smith 2005, Wejnert and Smith 2008, Wood *et al.* 2012, Enke *et al.* 2014).

Smith has been a member of the IBA since 1990, served on the organizing committee for the 10th IBA Conference in Wellington, New Zealand held in 1995, and she co-edited that conference volume (Gordon *et al.* 1996). Since 2001 she has served as the Treasurer of the Association and is now in her fifth term of office. She was the Conference Secretary for the 17th IBA Conference in Melbourne, 2016.

C. Smith was a co-author on a paper describing the bryozoan-rich Sulphur Well member, of the Lexington Limestone (Middle Ordovician) from central Kentucky (Ettensohn *et al.* 1986). In that paper he is identified as coming from the Department of

Geology, University of Kentucky.

Charles A.F. Smith III was a geophysicist at the University of Chicago who worked on large-scale models in marine ecology including bryozoans (e.g., Schopf *et al.* 1978) and paleobiology (CAF Smith 1977). His work was well-regarded at the time; he received a 1978 grant from the Henry-Marsh Fund, National Academy of Sciences for his work on variations in Ordovician fossils.

Damon Stanwell-Smith (b. 1970) is a UK-based marine biologist, with a BSc in Marine Biology from Swansea. His main (perhaps only) bryozoology paper (Stanwell-Smith and Barnes 1997) dates from his time at British Antarctic Survey (BAS) at Cambridge; he received his PhD from the BAS in the same year. An experienced commercial diver, he has also directed a consultancy company specialising in long-term monitoring, managed biodiversity research in East Africa and Southeast Asia, and led expeditions of icebreaker *MV Polar Star*. He is currently Senior Programme Officer, Ecosystem Assessment and Acting Head, Marine Assessment and Decision Support Programme, United Nations Environmental Programme, World Conservation Monitoring Centre.

Denys B. Smith (1929-2007) wrote more than 60 books and papers on Permian geology (e.g. DB Smith 1992), especially of the British Isles, while employed by the British Geological Survey. He was also President of the Leeds Geological Association and later the Yorkshire Geological Society (Cooper 2008). His study of the bryozoan-algal patch reefs of the upper Permian of northeast England remains the most comprehensive assessment of these geological features (DB Smith 1981).

Douglas G. Smith (b. 1955) grew up in Massachusetts, USA, graduating with a Bachelor's degree in 1977 from University of Massachusetts, Amherst. He became a lecturer and curator of Invertebrates in the Department of Biology, University Massachusetts at Amherst. Although now retired he remains active, continuing his research at Amherst.

Smith published extensively on freshwater bryozoans from North America between 1985 and 2003. He described new species (DG Smith 1992), distributions (DG Smith 1985, 1988, 1993) and morphology (DG Smith 1995, DG Smith *et al.* 2003). DG Smith and Wood's (1995) review of *Plumatella javanica* is his most highly cited bryozoan article (Google Scholar). He is also known for his five volumes of keys to the freshwater invertebrates of Massachusetts (with bryozoans appearing in DG Smith 1989) and his 4th Edition of *Pennak's Freshwater Invertebrates of the United States, Porifera to Crustacea* (DG Smith 2001), which included freshwater bryozoans in Chapter 12.

Franz Smith (b. 1970) studied for his BSc in the Virgin Islands, then received his PhD at Otago University in 1999, for a study on sessile invertebrates in Fiordland, New Zealand. His subsequent work has been in Chile, Australia, and around Antarctica. His

interest in bryozoans led to collaboration with Dennis Gordon at NIWA (F Smith and Gordon 2003). His most recent work is on classification systems for marine communities at CSIRO, Brisbane, Australia.

James Perrin Smith recorded bryozoan fossils from the Coal Measures at Poteau Mountain, “Indian Territory”, and in northeastern Arkansas (Smith, 1896). He is the only Smith recorded in Nickles and Bassler’s (1900) review of American fossil bryozoans.

L.W. Smith who was a student at the University of Swansea presented a paper on the ultrastructure of the tentacles of *Flustrellidra hispida* (LW Smith 1973) at the second IBA meeting in Durham, 1971.

Ralph Ingram Smith (1916-1993) was best-known as one of the editors of *Light’s manual: intertidal invertebrates of the central California coast*. This “bible” of the Pacific intertidal first appeared in 1941 (Light 1941) and was extensively expanded in a second edition published in 1954 (Light and Smith 1954). It is now known as the “Light and Smith Manual” to honour his contribution (Carlton 2007). He also produced a guide to invertebrates on the east coast of the USA (RI Smith 1964) that contained contributions on bryozoans authored by Mary Rogick (Rogick 1964a, b, Winston 2014). Another Smith from Massachusetts, Ralph received his degrees from Harvard, the PhD in 1942. He taught invertebrate zoology at University of California at Berkeley from 1946 until his retirement in 1987 (Carlton 2007). Each of the four editions of *Light’s manual* has contained a chapter on Ectoprocta or Bryozoa, mostly the work of Dorothy and John Soule (Soule *et al.* 1975), alongside Penny (*née* Pinter) Morris and, more lately, Henry Chaney (Soule *et al.* 2007)

Stanley Smith (1883-1955) published on fossil corals from around the world in the 1910s-1940s. He studied at Newcastle upon Tyne, then worked at universities around the UK and Canada before finishing up at the University of Bristol, where he worked from 1922 until his retirement in 1948 (Thomas 1955). His study of Valentian corals from Shropshire and Montgomeryshire (S Smith 1930) included reference to associated bryozoans in the faunas he described.

Stephen V. Smith studied carbonate production off southern California (SV Smith, 1972), including a section on bryozoan growth and calcification. His BA in Geology was from the University of Texas, followed by an MS in 1966 from Northwestern University and a PhD in 1970 at the University of Hawaii, where he is now an Emeritus Professor. His most-cited publications are in the area of marine nutrient fluxes and balances.

Fredrik Adam Smitt (sometimes ‘Fritz’, e.g., Nickles and Bassler, 1900, p. 544) (1839-1904) (Figure 3) was born in Halmstad, Sweden. Educated at Lund University and later Uppsala University in Sweden, he graduated from Uppsala in 1859, after which he

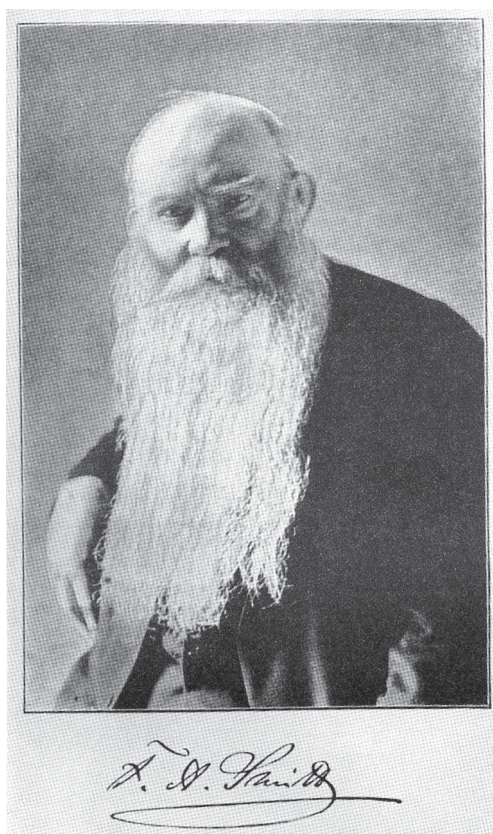


Figure 3. *Fredrik Adam Smitt*

took charge of zoological collections there. He received a PhD from Uppsala University in 1863 on the topic of development of marine bryozoans (Schopf and Bassett 1973). Appointed Professor of Vertebrates at Naturhistoriska Riskmuseum in Stockholm, he worked there for the rest of his life. He was the naturalist on the *Magdalena* expedition to Spitsbergen in 1861, and later on the *Josephine*, well known for his energy and toughness in these difficult environments.

“Smitt was the first Swedish naturalist to accept and apply Darwin’s theory of evolution” (Schopf and Bassett 1973). His research concentrated on evolutionary relationships among groups of organisms, with Bryozoa taking a central role in his publications and exploration. His work on Swedish (Smitt 1865, 1867, 1868a, b, 1872b, 1876, 1899) and Floridan (Smitt 1872a, 1873) bryozoans, as well as on the overall classification of bryozoans (Smitt 1868c, 1879 a, b) was thoroughly researched and beautifully illustrated, with the innovation, still followed today, of concentrating on zooid-level characters for diagnosis (Schopf and Bassett 1973). The most-cited of these (112 citations according to Google Scholar) is his monograph on Floridan bryozoans (Smitt 1872); this material has been recently re-evaluated and re-described (Winston

2005). Smitt was the scientist who coined the term “zooecium”, and was the first to recognise evolutionary lineages in his “Bryozoa Marina” (Smitt 1868c). Later in life he published on fishes and whales, as well as writing for a more general scientific audience (Smitt 1896).

Louis Bouvier Smyth (1883-1952), Professor of Geology at Trinity College, Dublin was an expert on corals from the Carboniferous. In a short paper published in 1922, however, he described the trepostome bryozoan *Stenophragmidium serrata* from the Carboniferous of County Antrim, Ireland (Smyth 1922).

Thomas Smyth, a Masters student at Trinity College, Dublin published a useful listing of the distribution of freshwater bryozoans in Ireland (Smyth 1994) and also examined the survival ability of statoblasts in a lake in western Ireland (Smyth and Reynolds 1995).

Thomas Cavalier-Smith (b. 1942) is a British biologist who is one of the most famous of those whose interest in bryozoans was occasional (e.g., Cavalier-Smith 1993, 1998, 2002). While Professor of Evolutionary Biology (now Emeritus) at the University of Oxford, he was presented with the International Prize for Biology in 2004, the Linnean Medal in 2007, and other awards (en.wikipedia.org/wiki/Thomas_Cavalier-Smith). He co-authored a paper on lophophorate phylogeny in *Science* (Conway Morris *et al.* 1996).

Robert L. Foster-Smith, known as Bob, co-authored with Peter Hayward the bryozoan section of the *Directory of the British Marine Fauna and Flora* produced by the British Marine Conservation Society (Hayward and Foster-Smith, 1987). He also produced a series of habitat maps and biological surveys of sublittoral habitats around the British coastline (e.g., Foster-Smith and Foster-Smith 1987), and developed classification systems for marine biotopes (Connor *et al.* 1995). He is now the chief consultant for Envision Mapping in the UK.

Anthony (Tony) Nelson-Smith collaborated with Peter Hayward on non-bryozoan subjects and he published with John Ryland a paper on the bryozoans of the west of Ireland (Ryland and Nelson-Smith 1975).

Ronald A. Tavener-Smith. The first Smith known to attend IBA meetings was Ronald A. Tavener-Smith (b. 1933). Born in North Wales, he attended University College of Wales, Aberystwyth, graduating in 1952. After serving in the British Army and on the Geological Survey of Northern Rhodesia, he took an academic position at Queen’s University, Belfast (1958-1972) and then at University of Natal, Durban (1972-1995). He is now an Emeritus Professor at the University of KwaZulu-Natal, South Africa.

Tavener-Smith published on bryozoans from 1965 into the 1980s, including papers in IBA volumes from 1968 Milan and 1971 Durham conferences. Though he was primarily a paleontologist, Tavener-Smith’s papers focus on structure and skeletal organisation in

both fossil and living bryozoans (Tavener-Smith 1968, 1969a, b, 1973b, Tavener-Smith and Williams 1970, 1972). He also published some general (Larwood *et al.* 1967), descriptive (Tavener-Smith 1965a, 1966a, b, 1971, 1973a, 1974) and taxonomic (Tavener-Smith 1965b, 1975, 1981) studies. The most highly-cited paper among his bryozoan publications is Tavener-Smith and Williams (1972) on the secretion and structure of living and fossil bryozoan skeletons (73 according to Google Scholar). In the late 1980s he left bryozoans behind and instigated research on coal and the geology of Natal.

3. Bryozoan taxa named for Smiths

A number of bryozoan taxa have been either named for F. A. Smitt, beginning with *Smittia* Hincks, 1879, or are taxa based upon his name erected due to distinctions from earlier-named similar taxa (i.e. *Alismittina* Soule and Soule 1954, *Parasmittina* Osburn, 1952, *Smittoidea* Osburn, 1952). The most speciose genera are *Smittina* Norman, 1903 (165 species) and *Parasmittina* Osburn, 1952 (138 species). Levinsen (1909) erected the family Smittinidae and Superfamily Smittinoidea.

In 2015, Gordon and Taylor (2015) named *Exochella abigailae* for Abigail M. Smith.

4. Conclusions

Smiths *et similis* have been key participants in bryozoology as far back as 1865. Soon after the IBA was founded a century later in 1965 Tavener-Smith participated in early meetings. After a brief Smith-hiatus, AM Smith and R Schmidt have supported the IBA at conferences, in proceedings volumes, and in its governance. Meanwhile many other Smiths have played roles as co-authors, editors, and occasional participants in the science of bryozoology, roles commemorated in the names of bryozoan taxa such as *Smittina* and *Smittoidea*.

It could be argued that a collection of profiles such as this, based only on a surname, is close to random and thus less than 'scientific'. Nevertheless, the opportunity to gather together a subset of the bryozoan literature for analysis is a real one, just as is a study of Polish bryozoologists, or of bryozoologists of the 1920s. It is perhaps justifiable solely on the basis that a conscientious scientist must know at all times to which Smith he or she is referring.

5. Acknowledgements

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References

- Anonymous. 1905. Fredrik Adam Smitt. *Kungliga Svenska Vetenskaps-Akademiens Arsbok for ar 1903* **1905**, 225–240.
- Bock, P. 2014. The Bryozoa Home Page. <http://bryozoa.net/index.html>, visited June, 2014.
- Brown, K.M., Schmidt, R. and Bone, Y. 2002. Observations on ecological adaptations of *Lanceopora smeatoni* (MacGillivray), from West Island, South Australia, pp. 61–65. In: P.N. Wyse Jackson, C.J. Buttler and M.E. Spencer Jones (eds) *Bryozoan Studies 2001*. A.A. Balkema Publishers, Lisse, Abingdon, Exton, Tokyo.
- Carlton, J.T. (ed.) 2007. *The Light and Smith Manual: Intertidal Invertebrates from Central California to Oregon*. Fourth Edition, revised and expanded.
- Cavalier-Smith, T. 1993. Kingdom Protozoa and its 18 phyla. *Microbiological Reviews* **57**, 953–994.
- Cavalier-Smith, T. 1998. A revised six-kingdom system of life. *Biological Reviews* **73**, 203–266.
- Cavalier-Smith, T. 2002. The phagotrophic origin of eukaryotes and phylogenetic classification of Protozoa. *International Journal of Systematic and Evolutionary Microbiology* **52**, 297–354.
- Connor, D.W., Hiscock, K., Foster-Smith R.L., Covey, R. 1995. Classification system for benthic marine biotopes, pp. 155–166. In: *Biology and Ecology of Shallow Coastal Waters*, Olsen and Olsen, Fredesborg.
- Conway Morris, S., Cohen, B.L., Gawthrop, A.B., Cavalier-Smith, T., Winnepeninckx, B. 1996. Lophophorate phylogeny. *Science* **272**, 282.
- Cooper, A. H. 2008. Denys Smith Memorial Trip: The Geology of Knaresborough Gorge □ YGS 1 June 2008. *British Geological Survey Open Report OR/08/044*. 18pp.
- Enke, S., Smith, A.M. and Hageman, S.J. 2014. Bryozoan settlement substrates and implications for carbonate sediment production. In: A. Rosso, P.N. Wyse Jackson and J.S. Porter (eds). *Bryozoan Studies 2013, Proceedings of the 16th International Bryozoology Association Conference, Catania Italy, September 2013. Studi Trentini di Scienze Naturali* **94**, 95–99.
- Ettensohn, F.R., Amig, B.C., Pashin, J.C., Greb, S.F., Harris, M.Q., Black, J.C., Cantrell, D.J., Smith, C.A. and McMahan, T.M. 1986. Paleocology and paleoenvironments of the bryozoan-rich Sulphur Well Member, Lexington Limestone (Middle Ordovician), central Kentucky. *Southeastern Geology* **26**, 199–219.
- Foster-Smith R.L. and Foster-Smith J.L. 1987. *A marine biological survey of Beadnell to Dunstanburgh Castle, Northumberland: a contribution to the Marine Nature Conservation Review (MNCR)*. Nature Conservancy Council, UK, 164 pp.
- Gordon, D.P., Smith, A.M. and Grant-Mackie, J.A. (eds). 1996. *Bryozoans in Space and Time*. NIWA, Wellington. 442 pp.
- Gordon, D.P. and Taylor, P.D. 2015. Bryozoa of the early Eocene Tumaio limestone, Chatham Island, New Zealand. *Journal of Systematic Palaeontology* **13** (12), 983–

1070.

- Hayward, P.J. and Foster-Smith, R., 1987. Bryozoa, pp. 280–294. In: Howson, C.M. (ed.) *Directory of the British marine fauna and flora. A coded checklist of the marine fauna and flora of the British Isles and its surrounding seas*. Marine Conservation Society, Ross-on-Wye.
- Kaljo, D. 1958. Fr Schmidt – Eesti geoloogia aluste rajaja (Fr. Schmidt – the founder of Geology bases). *Eesti Loodus (Estonian Naturalists)* **4**, 193–196.
- Key, M.M., Jr. and Smith A.M. 2003. From plate tectonics to bryozoan evolution. *Boletín de la Sociedad de Biología de Concepción* **74**, 75.
- Kirkpatrick, R. 1890. Report up on the Hydrozoa and Polyzoa collected by P.W. Bassett-Smith, Esq., surgeon RN, during the survey of the Tizard and Macclesfield banks, in the China Sea, by *H.M.S. Rambler*, Commander W.U. Moore. *Annals and Magazine of Natural History*, Series 6, **5**, 11–24.
- Larwood, G.P., Medd, A.W., Owen, D.E. and Tavener-Smith R. 1967. Bryozoa, Chapter 11, pp. 379–395. In: *The Fossil Record*. Geological Society of London.
- Nickles, J.M. and Bassler, R.S. 1900. Synopsis of American fossil Bryozoa. *United States Geological Survey Professional Paper* **173**, 663 pp.
- Ragazzola, F., Taylor, P.D., Bazzicalupo, P., Okamura, B. and Schmidt, D.N. 2014. A new species of the cheilostome bryozoan *Chiastosella* in the Southern Ocean, past and present. *Polar Biology* **37**, 773–779.
- Rogick, M.D. 1964a. Phylum Entoprocta, pp. 165–166. In: R.I. Smith (ed.). *Keys to Marine Invertebrates of the Woods Hole Region*. Woods Hole, Massachusetts, Systematics-Ecology Program, Marine Biological Laboratory.
- Rogick, M.D. 1964a. Phylum Ectoprocta, pp. 167–187. In: R.I. Smith (ed.). *Keys to Marine Invertebrates of the Woods Hole Region*. Woods Hole, Massachusetts, Systematics-Ecology Program, Marine Biological Laboratory.
- Ryland, J.S. and Nelson-Smith, A. 1975. Littoral and Benthic Investigations on the West Coast of Ireland: IV (Section A: Faunistic and Ecological Studies.) Some Shores in Counties Clare and Galway. *Proceedings of the Royal Irish Academy* **75B**, 245–266.
- Schmid, B.M. 1991. Recent bryozoan species from the Miocene of Nußdorf (Vienna) and their use for ecological interpretation. In: Bigey, F.P. and d'Hondt, J.-L. (eds). *Bryozoaires Actuels et Fossiles: Bryozoa Living and Fossil*. *Bulletin de la Société des Sciences Naturelles de l'Ouest de la France, Mmoire HS* **1**, 399–408.
- Schmidt, C.F. 1858. Untersuchungen ber die silurische Formation von Estland, Nord-Livland und Oesel. *Archiv für die Naturkund Liv-, Est- und Kurlands* **Bd. ii.**, 1–247, 467–474.
- Schmidt, F. 1885. Die Süßwasserbryozoen Livlands. *Sitzungsberichte der Naturforschergesellschaft zu Dorpat* VII. **2**, 350–359.
- Schmidt, O. 1876. Die Gattung *Loxosoma*. *Archiv für Mikroskopische Anatomie* **12**(1), 1–14.
- Schmidt, O. 1879. XLIV.—Remarks upon the memoirs on *Loxosoma*. *Annals and Magazine of Natural History Ser 5* **3**, 393–404. (Translated by W.S. Dallas from a 1878

- article in *Zeitschrift für Wissenschaftliche Zoologie* **11**, 68)
- Schmidt, R. and Bone, Y. 2002. Eocene Bryozoan Assemblages of the St Vincent Basin, South Australia, pp. 293–298. In: P.N. Wyse Jackson, C.J. Buttler and M.E. Spencer Jones (eds.) *Bryozoan Studies 2001*. A.A. Balkema Publishers, Lisse, Abingdon, Exton, Tokyo.
- Schmidt, R. and Bone, Y., 2003. Biogeography of Eocene bryozoans from the St Vincent Basin, South Australia. *Lethaia* **36**, 345–356.
- Schmidt, R. and Bone, Y. 2004. Australian Cainozoic Bryozoa, *Nudicella* gen. nov. (Onychozellidae, Cheilostomata) with palaeoenvironments and biogeography. *Alcheringa* **28**, 185–203.
- Schmidt, R. and Bone, Y. 2005. Palaeoenvironments of Eocene Bryozoa, St Vincent Basin, South Australia, pp. 281–291. In: H.I. Moyano G., J.M. Cancino and P.N. Wyse Jackson (eds) *Bryozoan Studies 2004*. A.A. Balkema Publishers, Leiden, London, New York, Philadelphia, Singapore.
- Schmidt, R. and Bone, Y. 2007. Australian Cainozoic Bryozoa, 2: Free-living Cheilostomata of the Eocene St Vincent Basin, S.A., including *Bonellina* gen nov. *Alcheringa* **31**, 67–84.
- Schmidt, R. and Gallagher, S.J., 2014. Front Row Seats to the Ice Age: Oligocene Bryozoa from a core on the south-eastern Australian Shelf. In: A. Rosso, P.N. Wyse Jackson and J.S. Porter (eds). *Bryozoan Studies 2013, Proceedings of the 16th International Bryozoology Association Conference*, Catania Italy, September 2013. *Studi Trentini di Scienze Naturali* **94**, 223–227.
- Schopf, T.J.M. and Bassett, E.L. 1973. F.A. Smitt, Marine Bryozoa, and the Introduction of Darwin into Sweden. *Transactions of the American Philosophical Society*, New Series **63**, 1–30.
- Schopf, T.J.M., Fisher, J.B. and Smith, C.A.F., III. 1978. Is the marine latitudinal diversity gradient merely another example of the species area curve?, pp. 365–386. In: B. Battaglia and J.A. Beardmore (eds) *Marine organisms: genetics, ecology and evolution*. Plenum Press, New York.
- Smith, A.M. 1995. Palaeoenvironmental interpretation using bryozoans: a review. *Geological Society of London Special Publication*, **83**, 231–243.
- Smith, A.M. 2008a. Corrections to the global distribution of *Hornera pectinata* (Bryozoa: Horneridae), pp. 295–300. In: S.J. Hageman, M.M. Key, J. and J.E. Winston (eds). *Bryozoan Studies 2007. Proceedings of the 14th International Bryozoology Association Conference*, Boone, North Carolina, July 1-8, 2007. Virginia Museum of Natural History, Martinsville.
- Smith, A.M. 2008b. Women in the International Bryozoology Association, 1965 to 2001, pp. 347–358. In: P.N. Wyse Jackson and M.E. Spencer Jones (eds). *Annals of Bryozoology 2*. International Bryozoology Association, Dublin.
- Smith, A.M. 2014. Growth and Calcification of Marine Bryozoans in a Changing Ocean. *Biological Bulletin* **226**, 203–210.
- Smith, A.M., Brunton, M.A. and Batson, P.B. 2005. Infestation of a temperate reservoir

- by freshwater bryozoans - an integrated research programme, 293–301. In: H.I. Moyano G., J.M. Cancino and P.N. Wyse Jackson (eds) *Bryozoan Studies 2004*. A.A. Balkema Publishers, Leiden, London, New York, Philadelphia, Singapore.
- Smith, A.M. and Garden, C. J. 2012. Being a Bimineralic Bryozoan in an Acidifying Ocean, pp. 327–337. In: A. Ernst, P. and J. Scholz (eds). *Bryozoan Studies 2010*. Springer, Heidelberg.
- Smith, A.M. and Key, M.M., Jr. 2004. Controls, variation, and a record of climate change in detailed stable isotope record in a single bryozoan skeleton. *Quaternary Research* **61**, 123–133.
- Smith, A.M., Key, M.M., Jr. and Gordon, D.P. 2006. Skeletal mineralogy of bryozoans: Taxonomic and temporal patterns. *Earth-Science Reviews* **78**, 287–306.
- Smith, A.M. and Nelson, C.S., 1993. Mineralogical, carbonate geochemical, and diagenetic data for modern New Zealand bryozoans. *Occasional Report, Department of Earth Sciences, University of Waikato* **17**, 1–71.
- Smith, A.M. and Nelson, C.S. 1994a. Calcification rates of rapidly colonising bryozoans in Hauraki Gulf, northern New Zealand. *N.Z. Journal of Marine and Freshwater Research* **28**, 227–234.
- Smith, A.M. and Nelson, C.S. 1994b. Selectivity in sea-floor processes: taphonomy of bryozoans, pp. 177–180. In: P.J. Hayward, J.S. Ryland and P.D. Taylor (eds). *Biology and Palaeobiology of Bryozoans*. Olsen and Olsen, Fredensborg.
- Smith, A. M. and Nelson, C.S. 1996. Differential abrasion of bryozoan skeletons: taphonomic implications for paleoenvironmental interpretation, pp. 305–313. In: D.P. Gordon, A.M. Smith and J.A. Grant-Mackie, J.A., (eds). *Bryozoans in Space and Time*. NIWA, Wellington.
- Smith, A.M., Nelson, C.S. and Danaher, P.J. 1992. Dissolution behaviour of bryozoan sediments: taphonomic implications for nontropical shelf carbonates. *Palaeogeography Palaeoclimatology Palaeoecology* **93**, 213–226.
- Smith, A.M., Nelson, C.S., Key, M.M., Jr. and Patterson, W.P. 2004. Stable isotope values in modern bryozoan carbonate from New Zealand and implications for paleoenvironmental interpretation. *New Zealand Journal of Geology and Geophysics* **47**, 809–821.
- Smith, A.M., Nelson, C.S., and Spencer, H.G. 1998. Skeletal carbonate mineralogy of New Zealand bryozoans. *Marine Geology*, **151**, 27–46.
- Smith, A.M., Spencer Jones, M.E. and Wyse Jackson, P.N. 2014. Bryozoans of the Krusenstern Expedition (1803-1806), pp. 183–194. In: P.N. Wyse Jackson and M.E. Spencer Jones (eds). *Annals of Bryozoology 4*. International Bryozoology Association, Dublin.
- Smith, A.M., Stewart, B., Key, M.M., Jr and Jamet, C.M., 2001. Growth and carbonate production by *Adeonellopsis* (Bryozoa: Cheilostomata) in: Doubtful Sound, New Zealand. *Palaeogeography Palaeoclimatology Palaeoecology* **175**, 201–210.
- Smith, A.M., Taylor, P.D. and Milne, R. 2012. *Hornera striata* (Milne Edwards, 1838), a British Pliocene Cyclostome Bryozoan Incorrectly Recorded from New Zealand,

- with Notes on Some Non-fenestrate *Hornera* from the Coralline Crag, pp. 339–356. In: A. Ernst, P. and J. Scholz (eds). *Bryozoan Studies 2010*. Springer, Heidelberg.
- Smith, A. M., Taylor, P. D. and Spencer, H. G., 2008. Resolution of taxonomic issues in the Horneridae (Bryozoa: Cyclostomata), pp. 359–411. In: P.N. Wyse Jackson and M.E. Spencer Jones (eds). *Annals of Bryozoology 2*. International Bryozoology Association, Dublin.
- Smith, C.A.F. 1977. Diversity associations as stochastic variables. *Paleobiology* **3**, 41–48.
- Smith, D.B. 1981. Bryozoan-algal patch-reefs in the Upper Permian Lower Magnesian Limestone of Yorkshire, Northeast England. *Society of Economic Paleontologists and Mineralogists Special Publication* **30**, 187–202.
- Smith, D.B. and Taylor, J.C.M. 1992. Permian. *Geological Society, London, Memoirs* **13**, 87–96.
- Smith, D.G. 1985. *Lophopodella carteri* (Hyatt), *Pottsiella erecta* (Potts) and other freshwater Ectoprocta in the Connecticut River (New England, USA). *Ohio Journal of Science* **85**, 67–70.
- Smith, D.G. 1988. *Stephanella hina* (Ectoprocta: Phylactolaemata) in North America, with notes on its morphology and systematics. *Journal of the North American Benthological Society* **7**, 253–259.
- Smith, D.G. 1989. *Keys to the freshwater macroinvertebrates of Massachusetts 4: Benthic Colonial Phyla*. Massachusetts Department of Environmental Quality Engineering, Division of Water Pollution Control, Westborough, MA., 48 pp.
- Smith, D.G. 1992. A new freshwater moss animal in the genus *Plumatella* (Ectoprocta: Phylactolaemata: Plumatellidae). *Canadian Journal of Zoology* **70**, 2192–2201.
- Smith, D.G. 1993. On a freshwater moss-animal (Ectoprocta) from St John, US Virgin Islands. *Caribbean Journal of Science* **29**, 214–219.
- Smith, D.G. 2001. *Pennak's freshwater invertebrates of the United States - Porifera to Crustacea* Fourth Edition. John Wiley and Sons, New York, 638 pp.
- Smith, D.G., Werle, S.F. and Klekowski, E. 2003. The anatomy and brooding biology of *Pottsiella erecta* (Potts, 1884) (Ectoprocta: Gymnolaemata: Ctenostomata), with an expanded diagnosis of the Pottsiellidae. *Hydrobiologia* **490**, 135–145.
- Smith, D.G. and Wood, T.S. 1995. A review of *Plumatella javanica* Kraepelin 1906 (Ectoprocta) with a reassessment of statoblast morphology. *Tropical Zoology* **8**, 361–366.
- Smith, F. and Gordon, D.P. 2003. Sessile invertebrates, pp. 80–91. In: N. Andrew and M.P. Francis (eds). *The Living Reef: The Ecology of New Zealand's Rocky Reefs*. Craig Potton Publishing, Nelson.
- Smith, J.P. 1896. Marine fossils from the Coal Measures of Arkansas. *Proceedings of the American Philosophical Society* **35**, 213–285.
- Smith, L.W. 1973. Ultrastructure of the tentacles of *Flustrellidra hispida* (Fabricius), pp. 335–342. In: G.P. Larwood (ed.). *Living and Fossil Bryozoa*. Academic Press, London.
- Smith, R.I. 1964. *Keys to Marine Invertebrates of the Woods Hole Region: a manual for*

- the identification of the more common marine invertebrates*. Contribution No. 11, Systematics-Ecology Program, Marine Biological Laboratory, Woods Hole.
- Smith, S., 1930. Some Valentinian corals from Shropshire and Montgomeryshire, with a note on a new stromatoporoid. *Quarterly Journal of the Geological Society (London)* **82**, 291–326.
- Smith, S.V. 1972. Production of calcium carbonate on the mainland shelf of southern California. *Limnology and Oceanography* **17**, 28–41.
- Smitt, F.A. 1865. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer: Pt I. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **22**, 115–149.
- Smitt, F.A. 1867. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer. II. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **23**, 395–534.
- Smitt, F.A. 1868a. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer: Pt III. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **24**, 279–429.
- Smitt, F.A. 1868b. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer. IV. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **25**, 3–230.
- Smitt, F.A. 1868c. Bryozoa marina in regionibus arcticis et borealibus viventia recensuit. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **24**, 443–487.
- Smitt, F.A. 1872a. Floridan Bryozoa collected by Count L.F. de Pourtales, Part 1. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* **10**, 1–20.
- Smitt, F.A. 1872b. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer, Part V. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **28**, 1115–1134.
- Smitt, F.A. 1873. Floridan Bryozoa collected by Count L.F. de Pourtales, Part 2. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* **11**, 1–83.
- Smitt, F.A. 1876. Kritisk förteckning öfver Skandinaviens Hafs-Bryozoer. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **24**, 3–230.
- Smitt, F.A., 1879a. Recensio systematica animalium Bryozoorum, quae in itineribus, annis 1875 et 1876 ad insulas Novaja Semlja. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **35**, 11–26.
- Smitt, F.A. 1879b. Recensio animalium Bryozoorum e mari arctico, quae ad paeninsulam Kola, in itinere anno 1877. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **35**, 19–32.
- Smitt, F.A. 1896. *La filiation des Espces d'Animaux*. pp. 235–238. In *CR des seances 3-me Congrès Intern Zool Leyde 1895*.
- Smitt, F.A. 1899. Preliminary notes on the arrangement of the genus *Gobius*, with an enumeration of its European species. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **56**, 543–555.
- Smyth, T.J. 1994. The distribution of freshwater Bryozoa in Ireland. *Bulletin of the Irish Biogeographical Society* **17**, 9–22.
- Smyth, T.J. and Reynolds, J.D. 1995. Survival ability of statoblasts of freshwater Bryozoa found in Renvyle Lough, County Galway. *Biology and Environment* **95B**, 65–68.
- Soule, J.D., Soule, D.F. and Pinter, P.A. 1975. Phylum Ectoprocta (Bryozoa), pp. 579–608. In: R.I. Smith and J.T. Carlton (eds). *Light's manual: intertidal invertebrates of*

- the central California coast*. 3rd edition. University of California Press, Berkeley, Los Angeles.
- Stanwell-Smith, D. and Barnes, D.K.A. 1997. Benthic community development in Antarctica: recruitment and growth on settlement panels at Signy Island. *Journal of Experimental Marine Biology and Ecology* **212**, 61–79.
- Steger, K.K. and Smith, A.M. 2005. Carbonate mineralogy of free-living bryozoans (Bryozoa: Otionellidae), Otago shelf, southern New Zealand. *Palaeogeography, Palaeoclimatology, Palaeoecology* **218**, 195–203.
- Tavener-Smith, R. 1965a. A new fenestrate bryozoan from the Lower Carboniferous of County Fermanagh. *Palaeontology* **8**, 478–491.
- Tavener-Smith, R. 1965b. A revision of *Retepora nodulosa* Phillips, 1836. *Geological Magazine* **102**, 135–142.
- Tavener-Smith, R. 1966a. The micrometric formula and the classification of fenestrate cryptostomes. *Palaeontology* **9**, 413–425.
- Tavener-Smith, R. 1966b. Ovicells in fenestrate cryptostomes of Visean age. *Journal of Paleontology* **40**, 190–198.
- Tavener-Smith, R. 1968. Skeletal structure and growth in the Fenestellidae (Bryozoa) (Preliminary Report). *Atti della Società Italiana di scienze naturali, e del Museo civico di storia naturale. Milano* **108**, 85–92.
- Tavener-Smith, R. 1969a. Wall structure and acanthopores in the bryozoan *Leioclema asperum*. *Lethaia* **4**, 89–97.
- Tavener-Smith, R. 1969b. Skeletal structure and growth in the Fenestellidae (Bryozoa). *Palaeontology* **12**, 281–309.
- Tavener-Smith, R. 1971. *Polypora stenostoma*, a Carboniferous bryozoan with cheilostomatous features. *Palaeontology* **14**, 178–187.
- Tavener-Smith, R. 1973a. Fenestrate Bryozoa from the Visean of County Fermanagh, Ireland. *Bulletin of the British Museum (Natural History) (Geology)* **23**, 391–493.
- Tavener-Smith, R. 1973b. Some aspects of skeletal organization in Bryozoa, pp. 349–359. In: G.P. Larwood (ed.). *Living and Fossil Bryozoa*. Academic Press, London.
- Tavener-Smith, R. 1974. Early growth stages in rhabdomesoid bryozoans from the Lower Carboniferous of Hook Head, Ireland. *Palaeontology* **17**, 149–164.
- Tavener-Smith, R. 1975. The phylogenetic affinities of fenestelloid bryozoans. *Palaeontology* **18**, 1–17.
- Tavener-Smith, R. 1981. The neotype of *Retepora nodulosa* Phillips, 1836. *Geological Magazine*, **118**, 565.
- Tavener-Smith, R. and Williams, A. 1970. Structure of the compensation sac in two ascophoran bryozoans. *Proceedings of the Royal Society London Series B* **175**, 235–254.
- Tavener-Smith, R. and Williams, A. 1972. The secretion and structure of the skeleton of living and fossil Bryozoa. *Philosophical Transactions of the Royal Society of London* **264**, 97–159.
- Thomas, H.D. 1955. Obituary: Dr. Stanley Smith. *Nature* **176**, 377.

- Wejnert, K.E. and Smith, A.M. 2008. Within-colony variation in skeletal mineralogy of *Adeonellopsis* sp. (Cheilostomata: Bryozoa) from New Zealand. *New Zealand Journal of Marine and Freshwater Research* **42b** 389–395.
- Winston, J.E., 2005. *Re-description and revision of Smitt's "Floridan Bryozoa" in the collection of the Museum of Comparative Zoology, Harvard University*. Virginia Museum of Natural History Memoir **14**, 1–148.
- Winston, J.E. 2014. Mary Dora Rogick: Mid-Century Nexus of Bryozoology, pp. 195–229. In P.N. Wyse Jackson and M.E. Spencer Jones (eds). *Annals of Bryozoology 4*. International Bryozoology Association, Dublin.
- Wood, A.C.L., Probert, P.K., Rowden, A.A. and Smith, A.M. 2012. Complex habitat generated by marine bryozoans: a review of its distribution, structure, diversity, threats and conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems* **22**, 547–563.

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