

FREDERICK RICHARD WOODWARD – ADDITIONS TO BIBLIOGRAPHY AND NEW TAXA

Dance, Hancock & Sutcliffe (2022) recently published a fine biography of Frederick Richard Woodward (1939–2020). Woodward was quite knowledgeable about freshwater mussels, especially the Unionoida of Africa, the fossil Unionidae of England, and the Margaritiferidae. He worked at several natural history museums in the United Kingdom, including those in London, Birmingham, Liverpool, and Glasgow.

Dance *et al.* (2022) also provided a list of five new species described by Woodward, and a bibliography of 42 publications that he authored or co-authored. The undersigned author compared this bibliography with the *2,400 Years of Malacology* online catalogue of malacological biographies and related works (Coan & Kabat, 2022), to see whether we had missed any Woodward papers. Instead, it was discovered that the *2,400 Years of Malacology* had seven papers authored by Woodward that were overlooked by Dance *et al.* (2022). Reviewing the *Zoological Record* (online) yielded another 15 overlooked papers. A search in the reprint files of the Mollusk Department, Museum of Comparative Zoology, uncovered several additional papers. Finally, Internet searches (in both OCLC WorldCat and Google), as well as reviewing the bibliographies of Woodward's own publications, and reviewing back issues of *The Conchologists' Newsletter*, identified yet other overlooked papers and books.

The result is an additional 13 overlooked new taxa described by Woodward, including 10 species, 1 genus, and 2 family-level names, thus more than tripling the total new taxa from 5 to 18. Similarly, the 51 overlooked Woodward publications listed herein have more than doubled his bibliography from 42 publications to 93 publications, including seven papers published in this journal, and another eleven papers published in *The Conchologists' Newsletter*.

It is obvious from Woodward's bibliography that he published a number of short notes in newsletters, as well as equally short identifications of fossil or sub-fossil molluscs as part of archaeological monographs. Both categories of publications are not well indexed by abstracting sources. While it cannot be guaranteed that

Woodward's bibliography, as supplemented herein, is complete, it is hoped that his bibliography is now significantly more complete, and that any remaining overlooked papers do not contain any new taxa or systematic changes.

One mystery is Woodward's 1991 paper, "Notes on naiad taxonomy (Bivalvia: Unionidae), 2: The genus *Prisodontopsis* Tomlin, 1928," published in the *Journal of Conchology*. Although the title indicates that this paper was part "2", it does not appear that a part "1" was ever published, as neither Dance *et al.* (2022: 314) nor I could find any trace of it.

Dance *et al.* (2022: 314) included two books that Woodward wrote – (1) *The Scottish Pearl in the World Context* (1994), a history of the *Margaritifera margaritifera* pearl industry, and (2) *Shells* (1993), a small book for the public with illustrations and descriptions of over 140 species. In addition, the *Shells* book was translated into at least four languages, *i.e.*, French (1995), German (1997), Danish (1998), and Swedish (1998), and combined with several other guidebooks as the *Rocks, Shells, Fossils, Minerals & Gems: the Complete Collector's Companion* (1997), a larger-page size (quarto) version. Further, Woodward authored at least one other book, also written for the general public: *Coral Reefs and Islands* (1995).

Woodward and Arthur Bogan organized the "Freshwater Bivalvia" symposium, with 12 oral presentations, at the 1992 Unitas Malacologica conference in Siena, Italy (30 August – 5 September 1992). The abstracts were published in 1992, but the proceedings of this symposium were not published. As it happened, Woodward was unable to attend, since he had a last-minute opportunity for extended travels in Russia to study *Margaritifera* (A. Bogan, *in litt.*).

In 1991, Woodward announced an "International Conference on Molluscan Conservation" to be held on 10–12 September 1992 at the University of Glasgow. The ambitious agenda for this conference "will include taxonomy, distribution, species biology, specific environmental factors, legislation, commercial aspects, genetic and demographic implications, captive breeding potential, health implications, and conservation"

(Anonymous 1991; Hughes, 1992). Due to bad timing – the conference was scheduled to take place only one week after the 1992 Unitas Malacologica conference in Siena (*supra*) – the Glasgow conference was not held. However, the Siena meeting had several symposia that encompassed molluscan conservation, including the aforementioned Bogan and Woodward symposium on “Freshwater Bivalvia,” along with the “Alan Solem Memorial Symposium on the Diversity and Conservation of the Mollusca” (organized by A. C. van Bruggen & Susan M. Wells) and the “European Invertebrate Survey Session” (organized by T. von Proschwitz & H. W. Waldén), so that molluscan conservation was well covered in 1992.

Woodward and Susan Wells were the founding editors of *Tentacle: The Newsletter of the IUCN/SSC Mollusc Specialist Group*, and issue no. 1 appeared in December 1989. While it is not always apparent from the early issues as to who authored various anonymous news items, Woodward likely authored one or more contributions in its early years. However, by issue no. 2 (1990), Wells was listed as the sole editor, and Woodward as merely handling the mailing list; by issue no. 3 (1993), Wells had also taken over the mailing list.

The first issue of *Tentacle* also announced a proposed newsletter, *Das Glochidium*, which “developed out of the Unionid workshop held at the 10th International Malacological Congress at Tubingen [in 1989] since it was felt that there is an urgent need to co-ordinate research and conservation projects on this group of freshwater bivalves;” Woodward was identified as the recipient of articles and requests for information (Anonymous, 1989: 5). However, this proposed newsletter does not appear to have ever been published.

Finally, in or around 1990, Woodward prepared a manuscript on the classification of the Margaritiferidae, “A revision of the pearly freshwater mussels belonging to the Margaritiferidae (Mollusca – Bivalvia – Unionacea).” This manuscript was never published, and was not mentioned by Dance *et al.* (2022). However, Woodward evidently shared it with colleagues in Russia when he traveled to that country in 1992 to study the Margaritiferidae. Unfortunately, some of those Russian colleagues then published the proposed new names, attributed to “Woodward, 1990,” but their publications did not make those

names available, as no description was provided as required by the *International Code of Zoological Nomenclature*. Ziuganov *et al.* (1994) listed the following manuscript names, all attributed to “Woodward, 1990” – the family-level name Promargaritiferidae (as a “subfamily”); the genera *Promargaritifera* and *Valdensia*; the subgenus *Hembelia*, and the species *Margaritifera (Pseudunio) tomlini*. Zotin (2018) also listed several of these manuscript names. In contrast, the European and North American literature has largely made no mention of Woodward’s manuscript names (*e.g.*, Huff *et al.* 2004; Graf & Cummings, 2006; Araujo *et al.*, 2017; Lopes-Lima *et al.*, 2018). The compendium of family-level names in the Bivalvia listed “Promargaritiferinae F.R. Woodward, 1994” as unavailable due to the absence of any description (Bouchet & Rocroi, 2010: 72, 124).

ADDITIONS TO WOODWARD’S NEW TAXA

Family-level names:

Note: Although Dance *et al.* (2022: 314) listed the Pain & Woodward 1968 paper, they did not index the new family-level names described therein.

Mweruellinae Pain & Woodward, 1968 (Unionidae, Africa).

Prisodontopsinae Pain & Woodward, 1968 (replacement name for Pseudaviculinae Modell, 1942) (Unionidae, Africa) [also as “Prisodonopsinae” in error (Pain & Woodward, 1968: 206)].

Pain & Woodward (1964: 5) described as new the subfamily “Pleiodoninae” but this family-level name was already established by Rochebrune in 1904 (Bouchet & Rocroi, 2010: 68).

Genera:

Pseudoparreysia Woodward, 1965 (Unionidae, Thailand).

Species:

Anodonta biltoni Woodward, 1964 (Jurassic, England).

Unio eadari Woodward, 1964 (Jurassic, England).

Unio jacksoni Woodward, 1964 (Jurassic, England).

Pseudoparreysia johnseni Woodward, 1965 (Recent, Thailand).

Unio brightoni Woodward, 1965 (Oligocene, England)

Unio cumberlandi Woodward, 1965 (Eocene, England)

Unio nuttalli Woodward, 1965 (Eocene, England)
Unio castelli Woodward, 1967 (Oligocene, England)
Unio sewardi Woodward, 1971 (Cretaceous, Greenland)
Unio thulei Woodward, 1971 (Cretaceous, Greenland)

The “Mussel Project” database (Graf & Cummings, 2022) also lists four of Woodward’s misspellings of older names: (1) “*Nilotriciana*” Pain & Woodward, 1961, error for *Niloticiana* Bourguignat, 1880; (2) “*Levourneaxiana*” Pain & Woodward, 1961, error for *Letourneuxiana* Bourguignat, 1880; (3) *Unio “humilus”* Woodward 1969: 54, error for *Unio humilis* Lea 1856; and (4) *Unio “naviglioformis”* Woodward 1984e: 195, error for *Unio navigioliformis* Lea 1859.

ADDITIONS TO WOODWARD BIBLIOGRAPHY

Note: the publications are in chronological order regardless of authorship sequence.

WOODWARD FR 1960 *Anodonta minima* Millet in Monmouthshire. *Journal of Conchology* **24(11)**: 401.
 CUMBERLAND RF & WOODWARD FR 1962 A note on *Anodonta anatina* var. *striata* of P. T. Deakin. *Proceedings of the Birmingham Natural History Society* **20(1)**: 52–56+errata [bibliography].
 WOODWARD FR 1964a The morphology of *Chamberlainia hainesiana* (Lea, 1856) (Unionidae, Bivalvia). *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i København* **126**: 337–345, pls: 31–33.
 WOODWARD FR 1964b On *Unio kendalli* Jackson, with descriptions of three new species of Jurassic Unionacea. *Journal of Conchology* **25(6)**: 235–239.
 WOODWARD FR 1964c On the occurrence of *Milax sowerbii* (Férussac) variety *bicolor* Cockerell in Worcestershire. *Proceedings of the Birmingham Natural History Society* **20(3)**: 36.
 WOODWARD FR 1964d Studies on *Polymesoda expansa* (Mousson) (Corbiculidae, Bivalvia) from the Bismarck Archipelago. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i København* **127**: 149–158, pl. 19.
 WOODWARD FR 1965a Monograph of the British Lower Tertiary Unionidae, with descriptions of three new species. *Journal of Conchology* **25(8)**: 316–330, pls: 22–27.
 WOODWARD FR 1965b The morphology of *Hyriopsis myersianus* (Lea, 1856), and *Pseudoparreyisia johnseni* gen. nov. sp. nov. (Unionidae, Bivalvia). *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i København* **128**: 205–219, pls: 31–35.
 WOODWARD FR 1965c Mollusca in the museum, Part I. *The Conchologists’ Newsletter* **12**: 73–76.
 WOODWARD FR 1965d Mollusca in the museum, Part II. *The Conchologists’ Newsletter* **13**: 84–87.

WOODWARD FR 1967 Monograph of the British Lower Tertiary Unionidae: corrections and additions. *Journal of Conchology* **26(3)**: 197–200, pl. 9.
 WOODWARD FR 1970 Review: *Das Tierreich, Superfamilia Unionacea* (Fritz Haas). *Journal of Conchology* **27(3)**: 204–206.
 WOODWARD FR 1971 Descriptions of two new species of fossil freshwater mussels (Unionidae) from Greenland. *Journal of Conchology* **27(4)**: 269–271, pls. 11, 11a.
 WOODWARD FR 1974 A survey of the Mollusca of Lake Chad, central Africa. Appendix C. Notes on the anatomy of *Caelatura* sp. from Lake Chad, northern Nigeria. *Revue de Zoologie Africaine* **88(2)**: 346–351.
 WOODWARD FR 1978 Obituary: Charles Theodore Cribb, 1888–1976. *Journal of Conchology* **29(5)**: 279–280, pl. 7.
 WOODWARD FR 1981c Marine molluscs from the Monastic Midden and Dun Bhuirg. In Reece R (ed.), *Excavations in Iona 1964 to 1974*, page 49. London: Institute of Archaeology, Occasional Publication 5: vii +118 pp.
 WOODWARD FR 1982b Shell. In Hunter JR & Morris CD, Appendix: Excavation of Room 5 clifftop settlement Brough of Birsay 1973–4, page 138, in Curle CL (ed.), *Pictish and Norse Finds from the Brough of Birsay 1934–74*. Edinburgh, Society of Antiquaries of Scotland, Monograph Series Number 1: 124–138.
 WOODWARD FR 1986b Captain James Laskey, an early nineteenth century naturalist [abstract]. In Heppell D (ed.), *Abstracts, Unitas Malacologica: Ninth International Malacological Congress*, page 99. Edinburgh: National Museums of Scotland, 103 pp.
 WOODWARD FR 1987c The Midland connection. *The Conchologists’ Newsletter* **100**: 431.
 WOODWARD FR 1988a Report on some molluscan remains. In Rothenberg B (ed.), *The Egyptian Mining Temple at Timna*, pages 265–266. London: Institute for Archaeo-Metallurgical Studies [and] Institute of Archaeology, University College, London, viii +317+[145] pp.
 WOODWARD FR 1988b S.O.S. – Save our shells! *The Conchologists’ Newsletter* **106**: 124–126.
 WOODWARD FR 1989d Samuel Archer and *Entemnotrochus adansoniana* (formerly *Pleurotomaria adansoniana*). *Proceedings of the Birmingham Natural History Society* **26(1)**: 25–28 [supplement to Woodward, 1963].
 WOODWARD FR 1989e Taxonomic notes on *Margaritifera* and its allies (Mollusca: Bivalvia: Unionacea) [abstract]. In Meier-Brook C (ed.), *Abstracts, Unitas Malacologica: Tenth International Malacological Congress*, page 274. Tropenmedizinischen Institut der Universität Tübingen, ii +287 pp.
 WOODWARD FR 1989f Proposal for licensing pearl fishing [abstract]. In Meier-Brook C (ed.), *Abstracts, Unitas Malacologica: Tenth International Malacological Congress*, page 275. Tropenmedizinischen Institut der Universität Tübingen, ii +287 pp.
 WOODWARD FR 1990c Snails for sale. *The Conchologists’ Newsletter* **113**: 294–295.

- WOODWARD FR 1990d The molluscan publications of Dr. W. B. Lorrain. *The Conchologists' Newsletter* **114**: 303–307.
- WOODWARD FR 1990e Problems in the control of exploitation of freshwater mussels, with particular reference to *Margaritifera*. In Council of Europe / Conseil de l'Europe, Colloquy on the Berne Convention on invertebrates and their conservation: conclusions and summaries (Strasbourg, 8–10 November 1989) / Colloque sur les invertébrés de la Convention de Berne et leur protection: conclusions et résumés (Strasbourg, 8–10 novembre 1989), pages 52–54. *Council of Europe Environmental Encounters Series / Conseil de l'Europe Rencontres Environnement* **10**: 76 pp.
- WOODWARD FR 1990f European Invertebrate Survey Data Sheet: *Margaritifera margaritifera*. Council of Europe, Strasbourg, T-PVS (90) **12**: 3–13 [not seen; cited in Woodward, 1992a: 79, 1992b: 60].
- MORDAN PB & WOODWARD FR 1990 Case 1643. *Mytilus anatinus* Linnaeus, 1758 (currently *Anodonta anatina*; Mollusca, Bivalvia): proposed designation of a neotype. *Bulletin of Zoological Nomenclature* **47(2)**: 110–113 [petition granted, ICZN Opinion 1651, *Bulletin of Zoological Nomenclature* **48(3)**: 261–262 (1991)].
- WOODWARD FR 1992a Thoughts on establishing coordinated European invertebrate projects using the freshwater pearl mussel, *Margaritifera margaritifera* (L.) as an example. In Council of Europe / Conseil de l'Europe, *Conserving and managing wetlands for invertebrates / Protection et gestion des zones humides pour les invertébrés*, Vaduz, Liechtenstein, 27–29 June/juin 1991, pages 77–79. *Council of Europe Environmental Encounters Series / Conseil de l'Europe Rencontres Environnement* **14**: 130 pp.
- WOODWARD FR 1992b Overview of progress on conservation of *Margaritifera* and other European freshwater unionids (Mollusca: Bivalvia) since April 1990. In (Anonymous, ed.), *Group of experts on conservation of invertebrates, 2nd meeting, 25–27 March 1992, Strasbourg*, pages 57–60. Council of Europe, T-PVS (92) **24**: 77 pp.
- WOODWARD FR 1992c From the Archives: Captain James Laskey and James Edward Smith. *The Linnean* **8(1)**: 8–10.
- WOODWARD FR 1992d Russia and the birth of *Ruthenica*. *The Conchologists' Newsletter* **121**: 11–16.
- BOGAN AE & FR WOODWARD 1992 A review of the higher classification of Unionoida (Mollusca: Bivalvia) [abstract]. In Giusti F & Manganelli G (eds.), *Unitas Malacologica: Eleventh International Malacological Congress, Siena, Italy, 30th August – 5th September, 1992*, pages 17–18. University of Siena, 536 pp.
- WOODWARD FR, ERARD C & McMILLAN J 1992 A tentative / provisional lexicon of naiad terminology [abstract]. In Giusti F & Manganelli G (eds.), *Unitas Malacologica: Eleventh International Malacological Congress, Siena, Italy, 30th August – 5th September, 1992*, page 46. University of Siena, 536 pp.
- WOODWARD FR 1993c Biographical notes 1. Raymond F. Cumberland, 1917–1984. *The Conchologists' Newsletter* **124**: 138–142.
- WOODWARD FR 1993d A further note on an anonymous catalogue of *Unio*'s attributed to C. M. Wheatley. *The Conchologists' Newsletter* **125**: 175–182.
- WOODWARD FR 1994b Biographical notes 2. Mrs Susanna Corrie of Woodville near Birmingham. *The Conchologists' Newsletter* **128**: 287–292.
- WOODWARD FR 1994c The legend of the Pansy shell. *The Conchologists' Newsletter* **128**: 315.
- WOODWARD F 1995a *Coral Reefs and Islands*. London, Bison Books & Stamford (Connecticut), Longmeadow Press, 127 pp.
- WOODWARD F 1995b *Coquillages: guide nature d'identification*. Paris: Nathan, 80 pp. (reprinted, 2001, Paris: Ed. Solar) (French translation of *Shells* (1993) by Véronique Cébal) [not seen; some library catalogs list this translation as “1993” and others as “1995”].
- WOODWARD FR 1996c John Smith's contribution to zoology. In Alcock L *et al.* (eds.), *John Smith of Dalry, Part 2 – Archaeology and Natural History*, pages 71–77. Ayrshire Archaeological and Natural History Society, Ayrshire Monograph **17**: 80 pp.
- WOODWARD FR 1996d Mollusca – Molluscs. In Helsdingen PJ van, Willemse L & Speight MCD (eds.), *Background information on Invertebrates of the Habitats Directive and the Bern Convention*, pp. 399–402. Strasbourg: Council of Europe, Vol. 3 (Mollusca and Echinodermata). *Nature and Environment* **81**: iv +399–529.
- WOODWARD FR 1996e *Margaritifera auricularia* (Spengler, 1793). In Helsdingen PJ van, Willemse L & Speight MCD (eds.), *Background information on Invertebrates of the Habitats Directive and the Bern Convention*, pages 495–500. Strasbourg: Council of Europe, Vol. 3 (Mollusca and Echinodermata). *Nature and Environment* **81**: iv +399–529.
- WOODWARD F 1997a *Muscheln; das neue kompakte Bestimmungsbuch*. Köln: Könemann, 80 pp. (German translation of *Shells* (1993) by Alexander Kluy) [not seen].
- WOODWARD F 1997b *Shells*. In Stewart-Jones H, Booth B, Hall C, Woodward F & Weidensaul S, *Rocks, Shells, Fossils, Minerals & Gems: the Complete Collector's Companion*. London: Grange Books, 160 pp. [section on *Shells*, pages 62–114 & 157, by Woodward; reprinted and retypeset from *Shells* (1993)].
- WOODWARD F 1998a *Skaller: Den nye udførlige opslabog*. Köln: Könemann, 80 pp. (Danish translation of *Shells* (1993) by Brian Laursen) [not seen].
- WOODWARD F 1998b *Snäckor: den nya, utförliga handboken*. Köln: Könemann, 80 pp. (Swedish translation of *Shells* (1993) by Ann Margret Forsström) [not seen].
- WOODWARD F 1999 Molluscs. In Crawford BE & Ballin Smith B (eds.), *The Biggings, Papa Stour, Shetland: the history and archaeology of a royal Norwegian farm*, pages 123–124. Edinburgh: Society of Antiquaries of Scotland, Monograph Series **15**: xxiv +268 pp., 21 pls.

- WOODWARD FR 2000 Correspondence: Adam White (1817–1879). *The Linnean* **16(2)**: 12–14.
- WOODWARD FR 2005 Observations on the implementation of the Bern Convention, the Habitats Directive and the European Water Framework Directive. In Procter D & Harding PT (eds.), Proceedings of INCardiff 2003, JNCC Report No. 367, pages 58–60. *Red Lists for Invertebrates: their application at different spatial scales – practical issues, pragmatic approaches*, 94 pp.

ACKNOWLEDGMENTS

Art Bogan (North Carolina Museum of Natural Sciences) provided helpful information regarding several publications and the 1992 Unitas Malacologica meeting. Dan Graf (University of Wisconsin – Stevens Point) provided helpful information regarding Woodward's use of certain taxonomic names.

REFERENCES

- ANONYMOUS 1989 Unionoida Newsletter. *Tentacle*; Newsletter of the IUCN/SSC Mollusc Specialist Group **1**: 5.
- ANONYMOUS 1991 Save the Snail conference. *Hawaiian Shell News* **39(8)**: 2.
- ARAÚJO R *ET AL.* 2017 The origin and phylogeny of Margaritiferidae (Bivalvia, Unionoida): a synthesis of molecular and fossil data. *Zoologica Scripta* **46**: 289–307.
- BOUCHET, P & ROCROI JP 2010. Nomenclator of bivalve families; with a classification of bivalve families by R. Bieler, J. G. Carter & E. V. Coan. *Malacologia* **52(2)**: 1–184.
- COAN EV & KABAT AR 2022 2,400 Years of Malacology (19th edition, January 6, 2022), 1,967 pp.+125 pp. [Annex 1 – Book Collations]+65 pp. [Annex 2 – Küster Collation], 64 pp. [Annex 3 – Journal Collations]. American Malacological Society: <https://ams.wildapricot.org/2400-Years-of-Malacology> (accessed 23 June 2022).
- DANCE SP, HANCOCK EG & SUTCLIFFE R 2022 Obituary of Frederick Richard Woodward (1939–2020). *Journal of Conchology* **44(3)**: 311–315.
- GRAF DL & CUMMINGS KS 2006 Palaeoheterodont diversity (Mollusca: Trigonioidea + Unionoida): what we know and what we wish we knew about freshwater mussel evolution. *Zoological Journal of the Linnean Society* **148(3)**: 343–394.
- GRAF DL & CUMMINGS KS 2022 The Mussel Project [The Freshwater Mussels (Unionoida) of the World (and other less consequential bivalves)], <http://mussel-project.uwsp.edu/> (accessed 23 June 2022).
- HUFF SW, CAMPBELL D, GUSTAFSON DL, LYDEARD C, ALTABA CR & GIRIBET G 2004 Investigations into the phylogenetic relationships of freshwater pearl mussels (Bivalvia: Margaritiferidae) based on molecular data: implications for their taxonomy and biogeography. *Journal of Molluscan Studies* **70(4)**: 379–388.
- HUGHES DG 1992 International Conference on Molluscan Conservation. *The Linnean* **8(1)**: 13.
- LOPES-LIMA M *ET AL.* 2018 Expansion and systematic redefinition of the most threatened freshwater mussel family, the Margaritiferidae. *Molecular Phylogenetics and Evolution* **127**: 98–118.
- ZIUGANOV V, ZOTIN A, NEZLIN L & TRETIAKOV V 1994 The freshwater pearl mussels and their relationships with salmonid fish. Moscow, VNIRO Publishing House, 104 pp.
- ZOTIN AA 2018 Sinonimii v semeistve Margaritiferidae (Bivalvia: Unionoida) [Synonymy in the family Margaritiferidae (Bivalvia: Unionoida)]. *Invertebrate Zoology* **15(1)**: 131–152 [in Russian; English abstract].

Alan R. Kabat
Research Associate,
Museum of Comparative Zoology
Harvard University
26 Oxford Street
Cambridge, Massachusetts 02138 U.S.A.
alankabat@aol.com

