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Thamniscus King, 1849 (Fenestellida: Bryozoa): William King's Original Specimens and Their Bearing on the Genus Concept

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Abstract—Reassessment of the suite of specimens used by William King when he erected the fenestrate bryozoan genus *Thamniscus* in 1849 has shown that they belong to two genera. However, King's original generic concept only allows for some of these specimens to be included within *Thamniscus*. These specimens are illustrated. A recent generic treatment is consistent with King's original generic concept.

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INTRODUCTION

In a recent paper, Lisitsyn and Ernst (2004) revised a number of septoporid fenestrate bryozoans, including the genus *Thamniscus*. This genus was originally erected by William King in 1849 (King, 1849, p. 389) and fully described and illustrated by him the following year in his now classic monograph of the Permian faunas from northeastern England (King, 1850). King designated *Ceratophytes* [= *Keratophytes*] *dubius* Schlotheim, 1820 as the type species of *Thamniscus*.

Lisitsyn and Ernst demonstrated on the basis of his descriptions and illustrations that the material King identified as belonging to *Thamniscus dubius* (Schlotheim, 1820) in fact consisted of a mixed suite of two taxa. One they identified in the revision as *Synocladia dubia* (Schlotheim, 1820), while the other they showed was characteristic of *Thamniscus* and, as such, had remained undescribed. This was fully described in the paper by Ernst as *Thamniscus perplexus* sp. nov., and this new species was designated as the type species of *Thamniscus* King, 1849 (Lisitsyn and Ernst, 2004, p. 57), in line with the recommendations of Article 70.3.2 of the International Code of Zoological Nomenclature (ICZN) (*International* …, 1999).

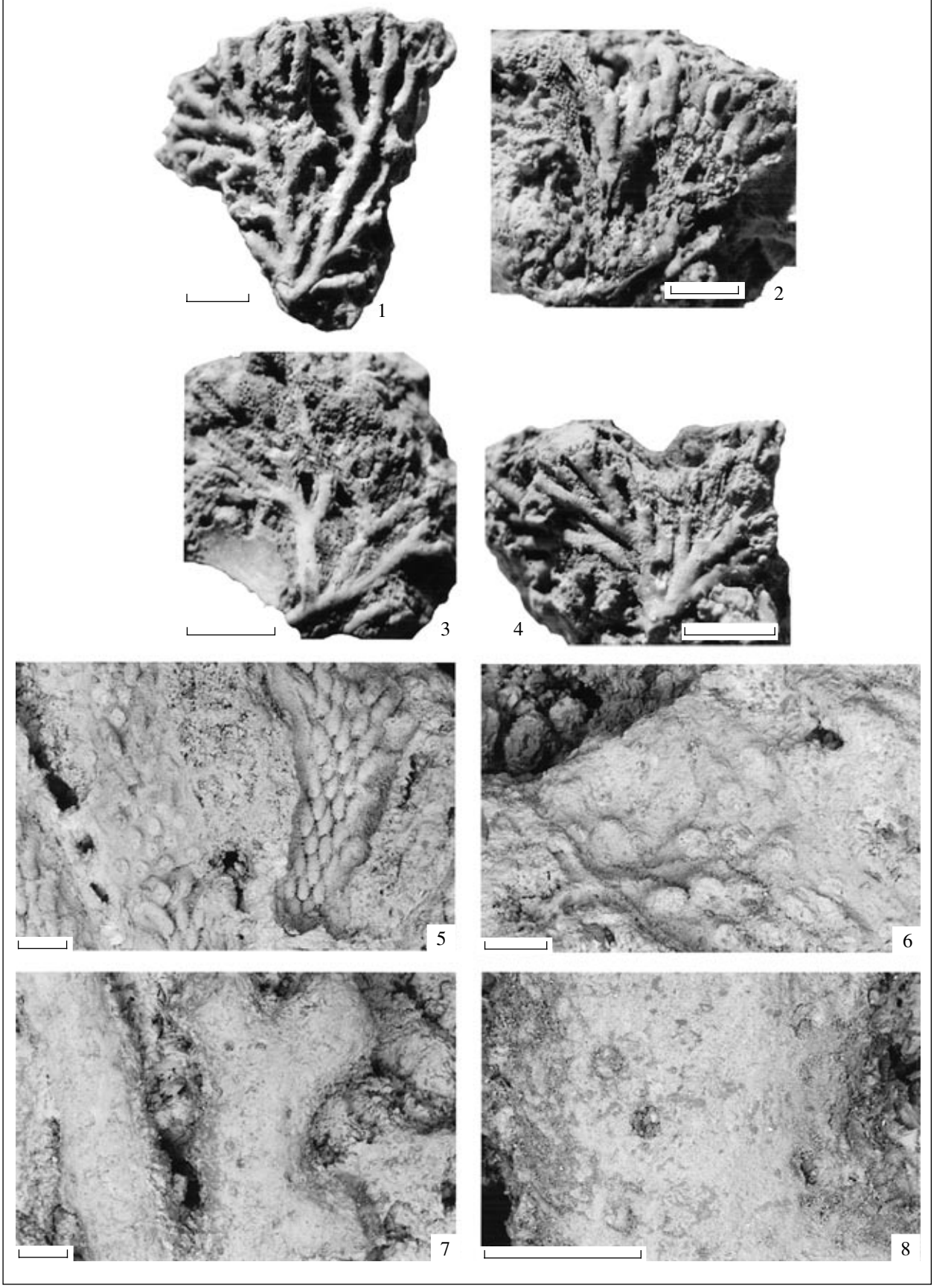
At the time of the 2004 revision, it was unknown if the original specimens of William King had survived, and following failed attempts by the authors to locate these in a number of institutions, a type specimen (BGR, X11875) was selected for *Thamniscus perplexus* from material from Germany (now in the Federal Institute of Geosciences and Raw Materials, Berlin). In selecting this type specimen the authors acted correctly, although it could be argued that perhaps it would have been better for the sake of continuity and stability to select one of King's specimens if (a) one had been available at the time of the revision and, if available, (b) the specimen was shown to be conspecific with *T. perplexus.*

Shortly after the publication of Lisitsyn and Ernst's paper, one of us (PNWJ) realized that King's collections were not actually lost: they are now housed in the James Mitchell Museum in the National University of Ireland, Galway [JMM F] (Pattison, 1977; Harper, 1992). The purpose of this communication is to bring to general attention the availability of King's important original suite of *Thamniscus* specimens, which, while not type specimens, are important because they constitute the material from which the concept of the genus was first derived. We document and illustrate this material in order to clarify King's original concept of *Thamniscus* and to compare this with the modern concept of the genus given in the recent revision (Ernst in Lisitsyn and Ernst, 2004). This is necessary because the modern concept is based on recently collected specimens from the Permian of Germany and on a reading of King's publications only.

KING'S MATERIAL IN GALWAY, IRELAND

William King ((1809–1886) was Professor of Geology at the Queen's College, Galway (now National University of Ireland, Galway) from 1849 until his

Plate 9



death. Prior to his appointment he had lived in Newcastle upon Tyne, where he served as Curator of the Museum of Natural History, and it was during this period that he assembled an extensive collection of fossils from the Upper Permian Zechstein reef succession (mid EZ1 cycle, see Southwood, 1985) in the locality. These were used by him as the basis for his 1849 paper and 1850 monograph. He then moved his collection to Ireland, and this caused some controversy, as his former employers at the Museum of Natural History felt that the fossils should have remained in Newcastle (Turner, 1979). After 1850, apart from an occasional paper on Permian faunas, King switched his research interests elsewhere and wrote on early hominids and on the pseudofossil *Eozoon canadense* (see Harper, 1988).

Pattison's (1977) list of type, figured, and cited specimens in King collection contains two entries under "*Thamniscus dubius*": JMM F B92A from Humbledon Hill near Sunderland, northeastern England, and JMM F B93 from Tunstall Hill, Sunderland, northeastern England. We have examined these specimens; JMM F B92 comprise five specimens of which JMM F B92A-D are *Thamniscus perplexus.* JMM F B92E is a specimen of *Synocladia dubia* (Schlotheim, 1820) as is B93—these are not considered further here. On the other hand, specimen JMM F B83A from the original King suite (not listed by Pattison) contains both *Thamniscus perplexus* and *Synocladia dubia.* JMM F B92A is the specimen illustrated by King (1850, pl. 5, figs. 7, 8, and, possibly, 11). JMM F B93 was figured in the same plate (pl. 5 fig. 10) and labeled in the caption as "*Thamniscus dubius*"; having examined the specimen on which this is based, it is clear that he misidentified this specimen, which is clearly *Synocladia* (as determined by its anastomosing lateral branches).

All of King's *Thamniscus* specimens show some degree of recrystallization and are generally not well preserved. All the specimens are orientated with the obverse surface face down in the matrix (Pl. 9, figs. 1, 3) and so some important information is lacking. Colonies form small erect foliose expansions (maximum dimensions: 18 mm high × 27 mm wide), composed of thin bifurcating branches, circular to subcircular in cross section, with undulating lateral margins (Pl. 9, figs. 1–4). Branches do not anastomose nor bear dissepiments; bifurcation occurs approximately every 3 mm along branch length. In some specimens the reverse wall has broken away in places, and details of the autozooecia such as the number of longitudinal rows, chamber shape, and aperture size and shape can be discerned (Pl. 9, figs. 2–6). Autozooecia are arranged in four to five longitudinal rows, chambers are simple tubes that curve from their budding locus towards the obverse surface (Pl. 9, fig. 5). Distal tubes appear to be short, and autozooecial apertures are circular to slightly oval in shape (Pl. 9, fig. 6). Little can be seen of cyclozooecia on obverse surfaces, and the presence of these heteromorphic zooids can only be surmised from rare circular structures associated with autozooecial apertures seen from behind at the bottom of the frontal wall (Pl. 9, fig. 6). One cyclozooecium appears to be associated with an autozooecium. Skeletal ultrastructure has been completely replaced in most specimens—in these the skeleton of the reverse walls now comprises coarse micrite, while internal chamber walls are made up of a powdery micrite. However, traces of microstructure can be seen in two specimens (B92A and B92D); the reverse surface carries faint longitudinal striae and cyclozooecia with small circular apertures are irregularly arranged (Plate 1, figs. 7, 8).

CONCEPT OF *THAMNISCUS* KING, 1849

King's original diagnosis of *Thamniscus* was short and contained no information about the internal structure of the autozooecia: "The typical Thamniscidia. Stems frequently and irregularly bifurcating more or less on one plane: celluliferous on the side overlooking the imaginary axis of the coral. Cellules imbricated, and arranged in quincunx. Gemmuliferous vesicles overlying the cellule-apertures." (King, 1849, p. 389).

Ernst (2004, p. 57) in Lisitsyn and Ernst (2004) gives the following diagnosis of *Thamniscus*: "Large branches with four to six (up to seven) alternating rows of zooecia. Branches usually freely bifurcating, anastomoses or dissepiments of rare occurrence. Apertures of zooecia round or slightly oval, with high peristome, usually containing one large node. Large nodes randomly arranged over surface of colony. Rows of zooecia separated by low sinuous ridges. Reverse surface of branches covered with straight coarse striae. Zooecia rhombic or, more rarely, hexagonal in median section. Varying numbers of cyclozooecia present on frontal surface of colony, frequently one cyclozooecium against one aperture. On reverse side of colony, cyclozooecia occur sporadically. Spines and radiciform processes occur rarely."

Explanation of Plate 9

Figs. 1–8. *Thamniscus perplexus* Ernst, 2004; (1) specimen JMM F B92A, colony fragment; (2) specimen JMM F B92C, colony fragment from reverse side; same locality and age; (3) specimen JMM F B92D, colony fragment from reverse side; same locality and age; (4) specimen JMM F B92B, colony fragment from reverse side, small low nodes occasionally developed, (5) specimen JMM F B92B, branch with reverse surface removed showing arrangement of autozooecial chambers in five longitudinal rows, (6) as (5) with circular autozooecial chambers and small circular cyclozooecia; same locality and age; (7) specimen JMM F B92A, cyclozooecia on reverse surface, (8) specimen JMM F B92A, detail of (7); Humbledon Hill near Sunderland, northeastern England; Middle Magnesian Limestone Reef, Zechstein, mid EZ1 cycle, Upper Permian.

Scale bars 5 mm (Figs. 1–4) and 500 μm (Figs. 5–8).

King's (1849) diagnosis is based on the external structure that he saw, and he placed significance on the gross structure of the branches and the presence of "gemmuliferous vesicles." These he later described in his 1850 (p. 45) paper as being small hemispherical bodies, which when their upper surface was removed left a small annular impression—these could be interpreted as being ovicells, which have been previously reported in fenestrate taxa, including a possible thamniscid from this Permian fauna (Bancroft, 1986; Southwood, 1985). King also noted the presence of similar-sized structures, which he termed "accessory vesicles," that are associated with autozooecial apertures and "foramina" on reverse surfaces—these are certainly cyclozooecia. He makes no reference to internal structure, even though internal structure is visible in his specimens. However, this oversight is not unusual for the time; only following the introduction of thin sectioning in the 1880s did some bryozoan researchers begin to describe internal features. In the earliest studies emphasis was placed on external features for determining genera; today the reverse is generally true. The diagnosis of *Thamniscus* given by Ernst (Lisitsyn and Ernst, 2004) is more comprehensive and inclusive of all morphological features, external and internal, and emphasizes the nature of branching and the development and arrangement of cyclozooecia.

CONCLUSIONS

Having examined King's original material, we cannot confirm the presence of ovicells and conclude that the "gemmuliferous vesicles" in this taxon are simply cyclozooecia—the upper surface referred to by King may be terminal diaphragms, although the poor state of preservation of specimens precludes confirmation of this. There are no additional morphological characters present that would add further to this recent diagnosis. Indeed, had King's material been available to Ernst, it is unlikely that they would have revealed as much morphological information as did his specimens from Germany, on account of their poor preservation and orientation in the matrix. Nevertheless, its is important to document and note King's specimens, which do demonstrate that the modern generic concept of *Thamniscus* is sound and conforms with that proposed over 150 years ago.

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REFERENCES

1. A. J. Bancroft, "Ovicells in the Palaeozoic Bryozoan Order Fenestrata," Palaeontology **29**, 155–164 (1986).
2. D. A. T. Harper, *William King D.Sc. (1809–1886): A Palaeontological Tribute* (Galway Univ. Press, Galway, 1988), pp. 1–90.
3. D. A. T. Harper, "The James Mitchell Museum: A Museum of a Museum," Geol. Cur. **5**, 292–297 (1992).
4. *International Code of Zoological Nomenclature*, 4th ed. (The International Trust for Zoological Nomenclature, London, 1999).
5. W. King, "On Some Families and Genera of Corals," Ann. Mag. Nat. Hist. Ser. 2 **3**, 338–390 (1849).
6. W. King, *A Monograph of the Permian Fossils of England* (Palaeontogr. Soc., London, 1850).
7. D. V. Lisitsyn and A. Ernst, "A Revision of the Paleozoic Bryozoan Genera *Synocladia* and *Thamniscus*," Paleontol. Zh., No. 3, 53–59 (2004) [Paleontol. J. **38** (3), 285–293 (2004)].
8. J. Pattison, "Catalogue of the Type, Figured, and Cited Specimens in the King Collection of Permian Fossils," Bull. Geol. Surv. Great Brit. **62**, 33–44 (1977).
9. D. A. Southwood, "Ovicells in Some Fenestrata from the Permian of NE England," in *Bryozoa: Ordovician to Recent*, Ed. by C. Nielsen and G. P. Larwood (Olsen & Olsen, Fredensborg, 1985), pp. 301–310.
10. S. Turner, "William King 1806–1886: The William King Affair," Newsl. Geol. Cur. Gp. **2** (6), 323–326 (1979).