

UNUSUAL STRICKLANDIID BRACHIOPODS
FROM THE UPPER LLANDOVERY BEDS NEAR
PRESTEIGNE, RADNORSHIRE

by A. M. ZIEGLER

ABSTRACT. Both smooth and strongly ribbed stricklandiid brachiopods occur together in early Upper Llandovery beds (C_1 - C_3) at Presteigne. *Aenigmastricklandia contorta* gen. et sp. nov. is proposed for the ribbed species, while the smooth species is assigned to *Stricklandia lens* aff. *progressa* Williams. *Aenigmastricklandia* appears to be an early ribbed offshoot of the main stricklandiid line; a parallel development is seen in *Costistricklandia*, which appeared toward the end of Upper Llandovery time (C_5 - C_6).

ONE of the specimens which Davidson included on his plate illustrating the species *Stricklandia lirata* was 'An internal cast of a small, exceptionally shaped or malformed specimen' collected from Nash Scar, near Presteigne (Davidson 1864-71, pl. 20, fig. 13). The specimen is preserved in the Geological Survey Museum and is unlike other stricklandiids in having very irregular, coarse, contorted costae. It might be considered an aberrant *Costistricklandia lirata*, but it was not a contemporary of *C. lirata*; this is indicated by the presence on the same block as the original specimen of several specimens of *Eocoelia* identical with Williams's subspecies *Eocoelia* (= *Coelospira*) *hemisphaerica sefinensis* (Williams 1951, p. 113). This *Eocoelia* occurs in C_1 beds at Llandovery and evolved into another form which occurs in C_4 beds at Llandovery (op. cit., p. 129). An upper time limit of C_3 may thus be established for Davidson's specimen, whereas *Costistricklandia lirata* with costae of equivalent strength did not appear until C_6 of the Upper Llandovery (op. cit., p. 129; St. Joseph 1935, p. 421).

To resolve this problem, bulk collections were made from all the fossil localities at present exposed in the Upper Llandovery beds of the inlier near Presteigne (see Table 1). Stricklandiids are nowhere abundant at Presteigne, but a few specimens were discovered in five of the six samples collected; one of these samples (No. 10247) came from a sandstone outcrop above the limestone quarries at Nash Scar and is probably close to Davidson's locality. The Nash Scar collection yielded two pedicle valves similar to Davidson's specimen and two pedicle valves of the ordinary smooth *Stricklandia lens*. Specimens like Davidson's were also found at locality 10245, a mile to the east-north-east. Thus, several specimens of Davidson's peculiar stricklandiid are now known from two, possibly three, localities. At locality 10247 they occur together with the distinctly different smooth *Stricklandia lens*. A new name, *Aenigmastricklandia contorta*, is here proposed for the peculiarly ribbed and distorted species.

A second, but possibly related, problem is posed by the other three collections. They contain smooth specimens referred to *Stricklandia lens* aff. *progressa*, but the specimens are small for this species (2.5 cm. long at the most) and some have asymmetric indentations (Pl. 58, fig. 6). These specimens are thus similar in some respects to the new species, *Aenigmastricklandia contorta*, but they do not have costae of any sort, and they have very short hinge-lines in contrast to specimens of *A. contorta* which have hinge-lines

TABLE 1. Localities of the Presteigne stricklandiid collections

USNM No.	Field No.	Grid Ref.	Exposure	Location	Stricklandiids
10242	P-R-A	SO/3177 6343	loose blocks beside secondary road	125 yds. north of 'The Folly' and 275 yds. NW of Corton House.	<i>Stricklandia lens</i> aff. <i>progressa</i>
10243	P-Q-A	SO/3197 6334	very large disused quarry	North of the B4362 road across from Corton House and 170 yds. WSW of railway bridge.	<i>Stricklandia lens</i> aff. <i>progressa</i>
10244	P-N-C	SO/3160 6320	small disused quarry	North of the B4362 road about 1 mile ENE of Nash Scar and 690 yds. WSW of railway bridge.	<i>Stricklandia lens</i> aff. <i>progressa</i>
10245	P-N-D	SO/3153 6316	roadside exposure	North of the B4362 road about 1 mile ENE of Nash Scar and 690 yds. WSW of railway bridge.	<i>Aenigmastricklandia contorta</i>
10247	P-S-A	SO/3018 6234	slumped outcrop	Above the large limestone quarries at Nash Scar.	<i>Aenigmastricklandia contorta</i> <i>Stricklandia lens</i>

that form, in some cases, the maximum width of the shell. The cardinalia are also different; the specimens referred to *S. lens* aff. *progressa* possess outer plates, but these are absent in the one brachial valve available of *A. contorta*. Thus, the specimens referred to *S. lens* aff. *progressa* are quite distinct from *A. contorta* despite some superficial similarities.

SYSTEMATIC DESCRIPTION

Genus *Aenigmastricklandia* nov.

Type species. *Aenigmastricklandia contorta* gen. et sp. nov.

Diagnosis. *Aenigmastricklandia* is a small stricklandiid characterized by very coarse irregularly branching costae and by a deep fold in the brachial valve with corresponding sulcus in the pedicle valve.

Comparison. *Aenigmastricklandia* differs from its contemporary, *Stricklandia*, in having costae and in having the 'outer plates' of the cardinalia atrophied; and from *Costistricklandia* in the irregularity of its costae, the prominence of its fold and sulcus, and the width of its hinge-line.

Aenigmastricklandia contorta gen. et sp. nov.

Plate 58, figs. 8-16

Holotype. *Stricklandia lirata* pars. Davidson 1864-71, 159-61, pl. 20, fig. 13, but not figs. 1-12.

Description. *Exterior.* The pedicle valve is quite convex and the brachial valve less so. The length-width dimensions are about equal, the greatest width being at the hinge-line

or just anterior to it. A prominent, rather narrow fold is present in the brachial valve with a corresponding sulcus in the pedicle valve. Commonly, there are irregular folds on other parts of the valves. Coarse uneven costae cross the valves and branch irregularly.

Interior of brachial valve. Only one specimen is known. It possesses cardinalia of a type reminiscent of *Stricklandia lens ultima* and *Costistricklandia lirata*; that is, the 'outer plates' are atrophied, and the 'inner plates' occur laterally to the brachial processes (Williams 1951, p. 103).

Interior of the pedicle valve. A spondylium is present but the median septum is atrophied.

Distribution. This species is known only from two localities (10245 and 10247) from the early Upper Llandovery beds of the small inlier to the south of Presteigne, Radnorshire.

Genus *Stricklandia*

Stricklandia lens aff. *progressa* Williams 1951

Plate 58, figs. 1-7

Description. Exterior. The pedicle valve is more convex than the brachial valve. The valves are often pear-shaped; the hinge-line is very short and the valve expands anteriorly. A fold is usually developed in the brachial valve with a corresponding sulcus in the pedicle valve. Some valves are not symmetrical and may have irregular folds or indentations.

Interior of brachial valve. The cardinalia are as figured by Williams (1951, pl. 5, figs. 1-3); outer plates, inner plates, and brachial processes are developed.

Interior of pedicle valve. The spondylium is present as usual and is supported by a short median septum.

Comparison. *Stricklandia lens* aff. *progressa* from Presteigne is similar to specimens from the type locality of *S. lens progressa* at Mandinam, Llandovery district (Williams

EXPLANATION OF PLATE 58

All figures $\times 2$. USNM—United States National Museum; GSM—Geological Survey and Museum. Figs. 1-7. *Stricklandia lens* aff. *progressa* Williams.

1, 2, USNM Collection No. 10244, spec. 140421; 1, Posterior view of internal mould of brachial valve; 2, Internal mould of brachial valve.

3, 4, USNM Collection No. 10244, spec. 140422; 3, Posterior view of internal mould of brachial valve; 4, Internal mould of brachial valve.

5, 6, USNM Collection No. 10244, spec. 140423; 5, Posterior view of internal mould of brachial valve; 6, Internal mould of brachial valve.

7, USNM Collection No. 10243, spec. 140424; Internal mould of pedicle valve.

Figs. 8-16. *Aenigmastricklandia contorta* gen. et sp. nov.

8, 9, USNM Collection No. 10245, spec. 140425; 8, Posterior view of internal mould of brachial valve; 9, Internal mould of brachial valve.

10-13, USNM Collection No. 10245, spec. 140426; 10, Posterior view of rubber replica of exterior of pedicle valve; 11, Rubber replica of exterior of pedicle valve; 12, Internal mould of pedicle valve; 13, Anterior view of internal mould of pedicle valve.

14, USNM Collection No. 10247, spec. 140427; Posterior view of rubber replica of exterior of pedicle valve.

15, 16, Holotype, GSM 13783, Nash Scar, Presteigne; 15, Internal mould of pedicle valve; 16, Anterior view of internal mould of pedicle valve.

1951, p. 102), but the specimens are only about half as long, with irregularities in the growth of the valves, and the hinge-line is unusually short.

Distribution. At Presteigne, *S. lens* aff. *progressa* occurs at localities 10242, 10243, and 10244 and possibly at locality 10247.

Conclusions

There are at least three ways to account for one or both of the unusual stricklandiids at Presteigne: (1) the individuals may have been diseased; (2) they may have been the victims of particularly harsh environmental conditions; or (3) they may have become genetically distinct from the parent stock, *Stricklandia*. The rocks are not deformed in any way, so the possibility that the specimens were contorted after they were buried may be ruled out. The first possibility is considered the least likely; a disease probably could not have produced the strong ribs of *Aenigmastricklandia*, and though it might have caused the deformities common among the stricklandiids described, it would be necessary to assume that this disease was peculiar to Presteigne, and persisted for some time (Collection 10245 came from at least 25 ft. stratigraphically above Collection 10244).

The second possibility, that of harsh environmental conditions, must be examined carefully. The fact that the stricklandiids of Presteigne are rare, small, and usually deformed suggests that environmental conditions unfavourable to stricklandiids persisted. The situation at Presteigne is particularly marked when compared with some surrounding areas, where large individuals of *Stricklandia* occur in profusion and characteristically dominate the faunal assemblage. An example of an environmental condition that might have caused the deformities in the stricklandiids of Presteigne is fast current action; there is, in fact, a suggestion in the conglomeratic nature of the sandstones that strong current action persisted at Presteigne. Under such conditions the mantles of the stricklandiids might very well have become damaged, resulting in the asymmetric, irregular form of the valves.

Environmental extremes are sufficient to account for many of the features of the Presteigne stricklandiids, but *Aenigmastricklandia* possesses a variety of characters, such as a prominent fold and sulcus, a wide hinge-line, and coarse costae, which easily distinguish it from contemporary stricklandiids and point to an evolutionary history separate from the main *Stricklandia lens* community. Alternatively, *Aenigmastricklandia* may have been a sport, but it was clearly viable since several specimens are known. In either case, *Aenigmastricklandia* would have been genetically distinct from *Stricklandia*.

In conclusion, the Upper Llandovery rocks of Presteigne are thought to represent a difficult environment for stricklandiid brachiopods. Two distinct genera, *Stricklandia* and *Aenigmastricklandia*, did, however, survive there, though specimens of each show deformities. Probably the individuals referred to *S. lens* aff. *progressa* drifted, as larvae, into the area from neighbouring *S. lens progressa* communities and either died in their youth or became stunted. *Aenigmastricklandia*, on the other hand, may have been endemic to the environment represented at Presteigne where it may very well have had an evolutionary history separate from the common *S. lens* community.

In any case, the presence of coarsely ribbed stricklandiids in deposits which may be confidently dated as early Upper Llandovery (C₁-C₃) on the basis of *Eocoelia hemisphaerica sefinensis* and *S. lens* aff. *progressa* must induce a measure of caution in those

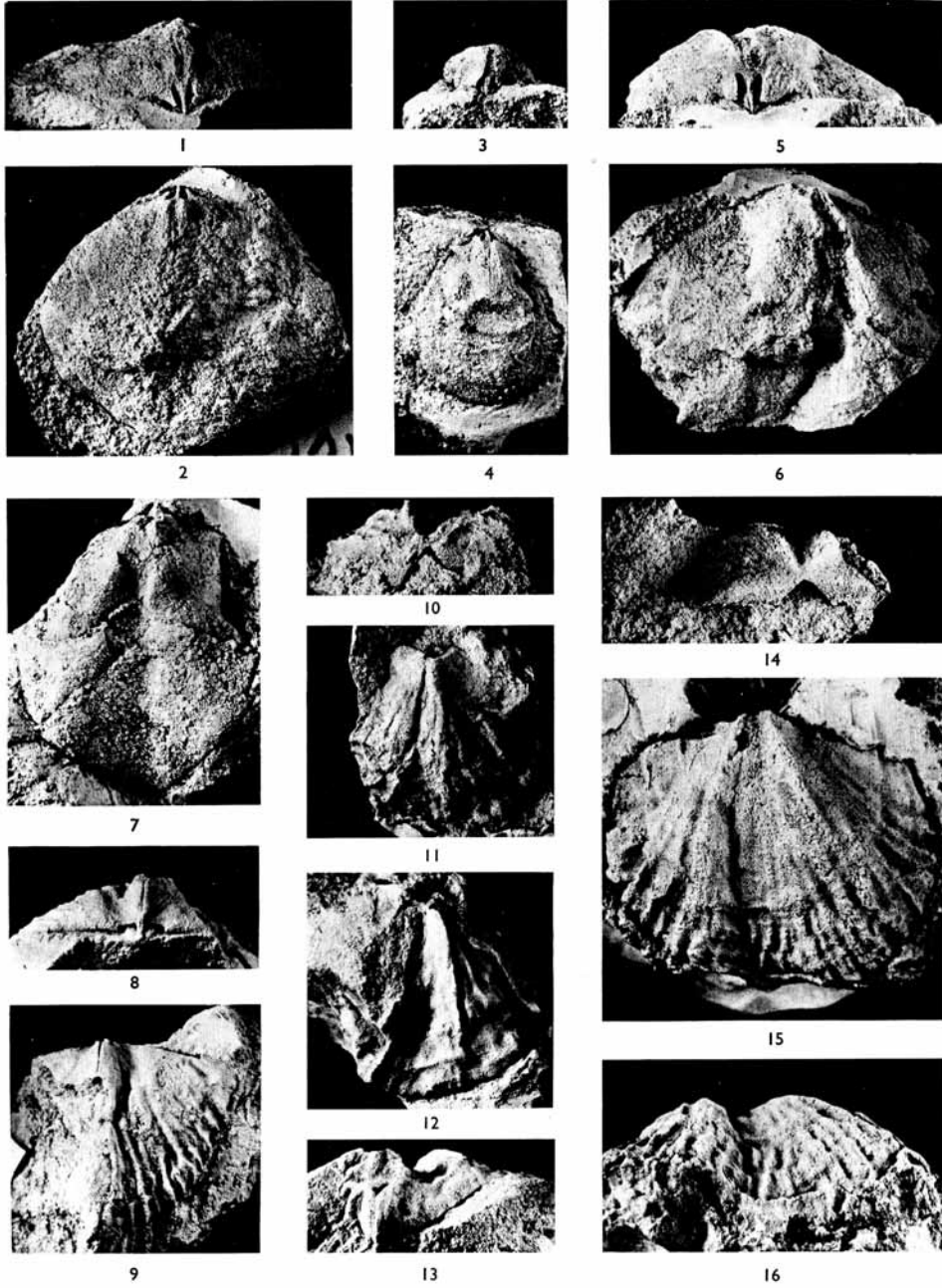
concerned with correlating Silurian deposits. Up to now it has been assumed that the occurrence of strongly ribbed stricklandiids indicated a late Upper Llandovery age (C₆), particularly as *Costistricklandia lirata typica* St. Joseph (C₆) may be linked with *Stricklandia lens ultima* Williams (C₄) by a series of forms showing intermediate grades of rib strength; these intermediates find taxonomic expression in the subspecies *Costistricklandia lirata alpha* St. Joseph. The development of ribbing in stricklandiids evidently occurred more than once.

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