

ON *NEOGLYPHIOCERAS SPIRALE* (PHILL.)
AND ALLIED SPECIES

BY

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(Plate A.)

ON *NEOGLYPHIOCERAS SPIRALE* (PHILL.)

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This species was selected by PLUMMER and SCOTT (1937, p. 185), as the lectogenotype of the genus *Neoglyphioceras* BRÜNING, 1923. It was originally described and figured by PHILLIPS in 1841 (p. 121, pl. 50, fig. 233), under the name of *Goniatites spiralis*, from crushed impressions in shale in the Culm measures of Bampton in north Devonshire. PHILLIPS's type material is lost, and the only topotypes known to me are impressions on four shale slabs (C 1640) in the British Museum (N.H.), and the species is here redescribed and refigured from this material.

It is considered desirable that a neotype should be erected for this species, and in so doing notice has been taken of the conditions for the designation of neotypes recommended by the International Commission on Zoological Nomenclature (HEMMING, 1953). *N. spirale* is a name in common use, the species is the lectogenotype of the genus *Neoglyphioceras*, and the original types appear to be lost. They have been searched for in the British Museum (Natural History), the Geological Survey Museum, the museums at York, Oxford, Cambridge and Exeter without success. The proposed neotype agrees with the original description and figure and is from the same locality, namely Bampton in North Devonshire. The specimen was presented to the British Museum (Natural History) by J. E. LEE in 1885.

N. spirale has a moderately broad venter separated from the gently convex flanks by a rounded but noticeable latero-ventral shoulder (Pl. A, fig. 4). The neotype (Pl. A, fig. 1) has a diameter of about 25 mm., but shews only the flanks of the specimen, and the species probably attained a diameter of 30 mm. The umbilicus is open but of moderate size with rounded edge and nearly vertical walls (Pl. A, fig. 1a), and is apparently about one sixth of the diameter. The ornament consists of dominant spiral striæ crossed by much fainter and closer transverse striæ, whilst constrictions about 4 per whorl are very strongly marked both on the flank and venter. When the ornament is well preserved the spiral striæ are seen to be beaded where crossed by the transverse striæ. Owing to the state of preservation the number of spiral striæ from the umbilicus to the centre of the venter is difficult to estimate

accurately, and is probably variable, but it seems to be from 25 to 30. The direction of the transverse striæ on the flanks is approximately radial, but they project forward into a broad salient at the latero-ventral shoulder, and then backwards to form a shallow hyponomic sinus on the venter (Pl. A, fig. 4). This salient and ventral sinus are more strongly marked in the young (Pl. A, fig. 8). Suture lines have not been seen in the type material.

Closely similar and probably identical material has been described and figured from Bredelar in Germany (HAUBOLD, 1932, pl. 18, fig. 6, RUPRECHT, 1936, pl. 9, fig. 9), and Mr. E.W.J. MOORE has collected moderately well preserved solid specimens from Co. Leitrim, Eire. These shew both ornament and suture lines. The horizon is near the junction of P_1 and P_2 . DEMANET (1938, p. 147, pl. 12, figs 8-11) has also recorded and figured it from Belgium.

Additional species which should apparently also be included in the genus *Neoglyphioceras* include *Goniatites subcircularis eisenbergensis* RUPRECHT, which has a wider umbilicus than *N. spirale*; and also possibly *Lyrogoniatites utahensis* MILLER, YOUNGQUIST and NIELSEN, in which the umbilicus is still larger, being about one third of the diameter.

The following genera have been erected on three species allied to *N. spirale*, but the distinctions between the genera are small, and the groups are possibly more artificial than natural :

Paragoniatites LIBROVITCH 1938, genotype *Gastrioceras caneyanum* GIRTY 1909 is closely similar to *Neoglyphioceras*, the principal distinctions in the genotype being that the spiral striæ are more widely spaced on the flanks than on the venter, and their number is somewhat fewer than in *Neoglyphioceras*. The shape of the shell and the suture lines appear to be very similar.

Lyrogoniatites MILLER and FURNISH, 1940, genotype *L. newsomi georgiensis*, MILLER and FURNISH, was erected for subglobular species, with broadly rounded venters and moderately large umbilici, having a surface ornamentation of prominent spiral striæ, and with very prominent transverse constrictions. Under this genus the authors ranged in addition to the genotype *Goniatites newsomi* SMITH and *G. entogonus* GABB, whilst later MILLER and YOUNGQUIST (1948) added *L. claudi*. Here also should be ranged *G. tonksi* E.W.J. MOORE, 1936, a species in which the spiral striæ have become obsolescent.

L. claudi and *L. entogonum* with their very wide umbilici and coarse spiral ornament appear to form a subgroup within the genus.

Lusitanoceras PEREIRA DE SOUSA, 1924, lectotype *Goniatites subcircularis* MILLER, selected by MILLER and FURNISH, 1940, at present includes only the one species, but its very compressed shape and forward bowing of the constrictions over the venter, mark it out from the three preceding genera.

The above four genera form a well-marked group here termed the Neoglyphioceratids. The suture lines in all four genera are very similar, and it seems possible that the generic distinctions may break down with the accumulation

of new material. The depths of the lobes and saddles are small compared with *Goniatites* s. str., but the shape of the ventral lobe in particular varies considerably even in one species. For example compare the suture lines of *L. subcircularis* as depicted by MILLER and FURNISH, 1940 (text fig. 5, p. 361), MILLER, YOUNGQUIST and NIELSEN, 1952 (text fig. 3, p. 158) and E.W.J. MOORE, 1936, (pl. 1, fig. 3). Also of two different specimens of *L. georgiensis* figured in BISAT, 1950 (fig. 1, k, 1, p. 17).

In general however, the first lateral saddle (ventral saddle) is well rounded, the lateral lobe is rather wide nearly straight sided with little or no basal spike, whilst the second saddle is high. This general description probably requires some qualification in the species here referred to *Neoglyphioceras*. In the Irish specimens referred here to *N. spirale* and also in *N. utahense* the ventral lobe tends to be narrower (more so in *utahense* than in *spirale*), the first lateral saddle subacute, whilst there is a small spike or nipple at the base of the lateral lobe. The suture line of *N. eisenbergense* is unknown.

Intermediate in character between *Neoglyphioceras* and the main stock of *Goniatites* lies *Goniatites granosum*, which like *N. spirale* has an ornament of dominant spiral striæ and shews strong constrictions. The spiral striæ are more closely spaced than in *N. spirale*, but further apart than in typical spirally-striate *Goniatites*. The suture line of *G. granosum* shews much closer affinities with *Goniatites* than *Neoglyphioceras*.

The holotype of *G. granosum* PORTLOCK, 1843, now in the Geological Survey Collection (31860), was refigured by E.W.J. MOORE in 1936 (Pl. III, fig. 6). It is unfortunately not well preserved but is generally assumed to be the same form as the one occurring commonly in zone P₂ in England and Germany, and which has three constrictions per whorl. This species was referred to and figured by KOBOLD (1932, pl. 23, figs. 28-34) as *Glyphioceras granosum poststriatum* BRÜNING. KOBOLD mentioned the nearly constant number of 36 spiral striæ between the umbilicus and the centre of the venter, and also the three constrictions per whorl, (*op. cit.*, p. 498). See also DEMANET (1938, p. 149, figs. 12, 12a). A form with practically identical ornament but with four constrictions per whorl, and with a suture line more closely approaching that of typical *Goniatites* occurs at Ing Barns Wood near Slaidburn, associated with *Sudeticeras crenistriatus* (figured by RUPRECHT, 1936, pl. 9, fig. 16; pl. 10, figs. 1, 2) and an openly umbilicated *Neoglyphioceratid* with strong widely spaced spiral striæ. This last form was referred by E.W.J. MOORE to *Goniatites caneyanum* and figured by him (1936, pl. I, fig. 2), although its identity with that species seems doubtful. The above three species occur crushed in shale at or near the base of P₂ at Dinckley.

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PLATE A

EXPLANATION OF PLATE A.

Neoglyphioceras spirale (PHILL.).
from type locality : Bampton, Devonshire.

FIG. 1. — Neotype — Flank shewing constrictions, spiral striae, delicate close transverse striae, and some transverse wrinkles.

FIG. 1a. — Counterpart of last.

FIG. 2. — Similar flank to neotype.

FIGS. 3, 3a. — Fragment of adult ornament.

FIG. 4. — Venter of adult shewing salient in transverse striae at latero-ventral shoulder.

FIG. 5. — Flank shewing constrictions.

FIG. 6. — Fragment shewing ornament of latero-ventral shoulder, venter and part of flank in adult.

FIGS. 7, 7a. — Adolescent venter shewing ornament (2 photos with different lighting).
All above : $\times 3$.

FIG. 8. — Young venter shewing ornament.

FIG. 9. — Adolescent venter and flank shewing ornament.

Figs. 8 and 9 : $\times 4 \frac{1}{2}$.



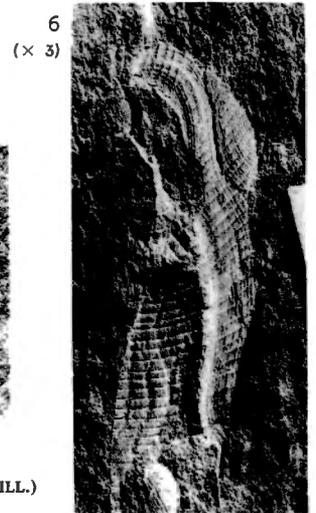
1
(x 3)



1 a
(x 3)



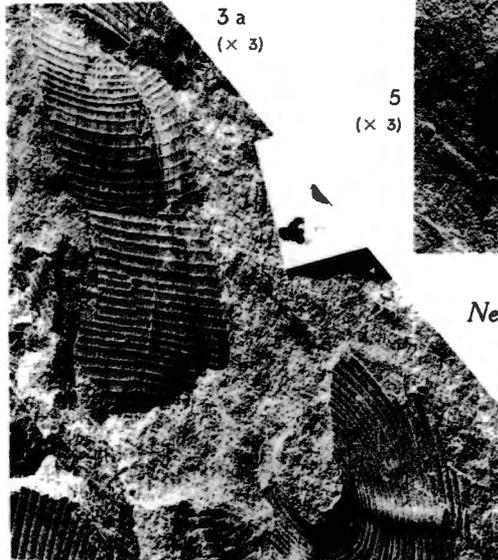
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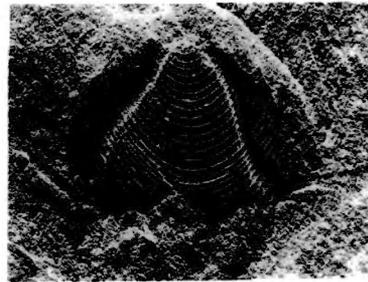
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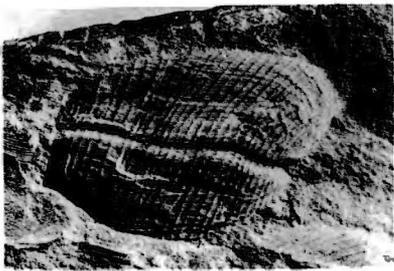


3 a
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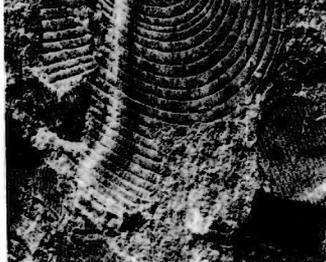


5
(x 3)

Neoglyphioceras spirale (PHILL.)



7
(x 3)



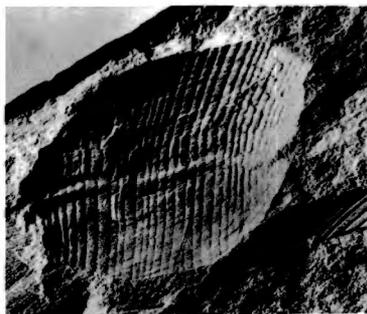
2
(x 3)



9
(x 4 1/2)



8
(x 4 1/2)



7 a
(x 3)

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