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OF THE
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FIELD CLUB
(SESSION 1910—11)

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NOTES ON SOME SPECIES OF GERVILLIA FROM
THE LOWER AND MIDDLE JURASSIC ROCKS
OF GLOUCESTERSHIRE¹

By E. TALBOT PARIS, F.C.S.

[Plates XXVIII.-XXIX.]

I. INTRODUCTION

During the progress of my work in connection with the revision of the lamellibranchs from the Lower and Middle Jurassic rocks² of Gloucestershire, a considerable amount of useful information concerning certain species of the Genus *Gervillia* has been obtained, which it appears desirable to record in the Proceedings of the Club.

All the specimens referred to in this paper are in Mr Richardson's collection, unless otherwise stated. His collection has been mainly studied because it appeared desirable to be sure of the horizons from which the specimens were obtained.

The Genus *Gervillia* belongs to the family Pernidæ, Zittel. The Pernidæ altogether embrace seven genera. Of these, one (*Bakewellia*) is found only in Permian deposits, another (*Odonotoperna*) occurs only in the Trias, and another (*Crenatula*) does not definitely make its appearance until the Cretaceous period. The remaining four (*Gervillia*, *Perna*, *Pernostrea* and *Inoceramus*) are known to occur in Jurassic rocks, but the Lower and Middle Jurassic rocks of Gloucestershire have yielded representatives of only three, namely, *Gervillia*, *Perna* and *Inoceramus*.

¹ I have to acknowledge my indebtedness to the Government Grant Committee of the Royal Society for assistance towards acquiring the information contained in this paper and figuring the specimens.

² As defined by Mr A. J. Jukes-Browne in "The Students' Handbook of Stratigraphical Geology."

Gervillia and *Perna* range upwards from the Trias, and where they are first found in the Lias already possess well-marked generic characters. *Inoceramus*, on the other hand, makes its first appearance in the Lower Lias, and some of the forms which occur at that horizon differ somewhat from the typical examples of the genus which are found in Cretaceous rocks. Some of them exhibit a strong resemblance to *Perna*, which is probably the parent-genus.

Owing to the fact that the classification of this group of shells is based primarily on the characters of the cardinal area, it is frequently a matter of difficulty to assign any particular form to its proper genus. For it is only in exceptional cases that the hinge-area is exhibited, and when it is not, the general form of the shell has to be used as a guide.

Below is given, in tabular form, a summary of the chief characters of each of the three genera, *Gervillia*, *Perna* and *Inoceramus*.

Genus	Ligament	Dentition	General Form, etc.
<i>Gervillia</i> , Deffr.	Usually four or five ligamentary sulcations in hinge-area.	Generally two or three teeth, obliquely placed, but sometimes these are represented only by obscure dental ridges.	The shell, as a rule, is much more elongate than either <i>Perna</i> or <i>Inoceramus</i> .
<i>Perna</i> , Brug.	As in <i>Gervillia</i> , but the sulcations are often more pronounced.	Edentulous.	Usually of a subquadrate form.
<i>Inoceramus</i> , Sow.	Ligamentary sulcations smaller & more numerous than in <i>Perna</i> or <i>Gervillia</i> .	Edentulous.	Generally of a more rounded appearance than <i>Perna</i> .

TABLE I.—SPECIES OF *GERVILLIA* FROM GLOUCESTERSHIRE
NOTICED IN THIS PAPER

<i>Name of Species</i>	<i>Horizon or hemera</i>
<i>Gervillia aurita</i> Lycett	<i>bradfordensis</i> .
<i>G. bathonica</i> Morris and Lycett	Great Oolite
<i>G. bicostata</i> Lyc.	Great Oolite.
<i>G. compressa</i> Whidborne	<i>bradfordensis</i> .
<i>G. coriniensis</i> sp. nov.	Forest Marble
<i>G. crassa</i> J. Buckman	<i>turneri</i> or <i>obtus</i> , <i>oxynoti</i>
<i>G. crassicosta</i> M. & L.	Great Oolite
<i>G. fornicata</i> Lyc.	<i>variabilis</i> and <i>moorei</i>
<i>G. lævis</i> J. Buckman	<i>striati-capricornus</i>
<i>G. lata</i> Phillips	<i>murchisonæ</i>
<i>G. monotis</i> Eudes-Deslongchamps	Great Oolite
<i>G. "ornata"</i> Lyc.	Great Oolite
<i>G. prælonga</i> Lyc.	<i>discitæ</i> , <i>post-discitæ</i> , <i>witchelliæ</i> and <i>truellei</i> .
<i>G. subcylindrica</i> M. & L.	Great Oolite
<i>G. tortuosa</i> (Sowerby)	<i>murchisonæ</i> , <i>concavi</i> , <i>discitæ</i> or <i>post-discitæ</i> .
<i>G. waltoni</i> Lyc.	Great Oolite and Forest Marble.
<i>G. whidbornei</i> nom. nov.	<i>variabilis</i> , <i>?concavi</i> , <i>discitæ</i> and <i>post-discitæ</i>

So far, seventeen species belonging to *Gervillia* have been recognised in Gloucestershire, one of which is new. Of these seventeen species, the Lias has yielded four, the Inferior Oolite six (one common to Lias and Oolite), and the Great Oolite series eight.

In order to secure the correct identification of the species most of the type-specimens have been examined. Through the courtesy of the curators, I have been permitted to borrow the type-specimens of *Gervillia* from the Geological Survey Museum, York Museum, Bath Museum, and the Sedgwick Museum, Cambridge. In each case the types have been photographed and measured, and the matrix of the specimen carefully examined with a view to ascertaining the exact horizon from which the specimen was obtained. Fortunately, many of the types are from localities in Gloucestershire, and are preserved in matrices which have been readily identified by Mr Richardson.

A complete list of the species examined and the dates of their existence are given on Table I., and both there and in the following notes, the species are arranged alphabetically.

GERVILLIA AURITA Lycett. Pl. xxix, Fig. 6.

Type-description (T.d.) 1853. Proc. Cottesw. Nat. F.C., vol. i., p. 82.

Type-figure (T.f.) *Ibid.*, pl. II., Fig. 4.

Type-locality (T.l.) "Nailsworth, Gloucestershire."

Horizon (H.) "Inferior Oolite" [Aalenian].

Hemera (η). [*bradfordensis*.]

Collection (Colln.) Museum of Practical Geology, Jermyn Street,
London. [Reg. No. 8862.]

Type-description.—"Gervillia aurita: equivalve, smooth, very oblique, both the auricles very much extended and acuminate, the entire figure being very slender."

Remarks.—The label attached to the type-specimen gives the locality as "Nailsworth," which is close to Minchinhampton. The matrix of the specimen, a white oolitic limestone, shows that it could only have come from the Aalenian at that locality. In his list of species from the Oolite Marl, Lycett ("Cotteswold Hills," 1857, p. 56) records *G. aurita*, and mentions it from no other horizon. Probably the specimen is from the local *Nerinea*-Bed (Oolite Marl) of the old Scar-Hill Quarry, Nailsworth, whence Lycett obtained so many lamellibranchs (*vide* L. Richardson, Proc. Cottesw. Nat. F.C., vol. xvii., pt. I., 1910, p. 131.)

Records.—The only record is that of the holotype from the *bradfordensis* deposits of Nailsworth.

GERVILLIA BATHONICA Morris and Lycett.

T.d. 1853. Monogr. Moll. Gt. Ool., pt. II, pp. 21-22. Pal. Soc.

T.f. *Ibid.*, tab II., fig. 15.

T.l. "Minchinhampton [near Stroud, Gloucestershire]."

H. "Great Oolite." [Bathonian]

η. ["*maxillatae*."]

Colln. —

1882. *Gervillia bathonica* M. and L., E. Witchell, Geol. of Stroud,
p. 80, pl. 2, fig. 8.

Record.—Great Oolite, Minchinhampton Common near Stroud.

GERVILLIA BICOSTATA Lycett.

T.d. 1863. Suppl. Monogr. Moll. Gt. Ool., pp. 111-112. Pal. Soc.

T.f. *Ibid.*, tab. XL., fig. 21.

T.l. "Bussage, near Bisley [near Stroud]."

H. "Great Oolite." [Bathonian]

. ["*maxillatæ*."]

Colln. —

Record.—The holotype appears to be unique.

GERVILLIA COMPRESSA Whidborne. Pl. xxix., Fig. 5

T.d. 1883. Quart. Journ. Geol. Soc., vol. xxxix., p. 517.

T.f. *Ibid.*, pl. xvi., fig. 6.

T.l. "Nailsworth, Gloucestershire."

H. "Inferior Oolite." [Aalenian]

ŋ. [*bradfordensis*]

Colln. Mus. Pract. Geol., Jermyn Street. [1883].

Remarks.—The holotype of *Gervillia compressa* is labelled "*Gervillia lata* Phill. I.O. Nailsworth." Probably this was Lycett's identification of the species. The matrix is a white oolitic freestone and is evidence that the specimen was obtained from either the *Bradfordensis*-Beds or the Lower Freestone at Nailsworth—probably from the old Scar Hill Quarry.

Compared with *Gervillia lata* Phillips, this species is more elongate, and has a relatively shorter hinge-line. *G. lata*, moreover, does not possess the marked, slightly concave carina, extending from the umbo to the posterior extremity of the shell; nor is it so flattened along the antero-ventral border.

The statement in Whidborne's description that the hinge-line of *G. compressa* is "nearly of the same length as the shell" is inaccurate, even when it is remembered that the so-called "length of the shell" in his description is what is now called the "height." The following measurements have been taken from the holotype. Length (measured parallel to the hinge-line), 67 mm.; height (measured at right angles to the hinge-line), 37 mm.; length of the hinge-margin, 48 mm.

Record.—*Bradfordensis*-Beds or Lower Freestone, Nailsworth, Gloucestershire.

GERVILLIA CORINIENSIS sp. nov. Pl. XXIX., figs. 1a & b.

T.l. Quarry one mile W.S.W. of Siddington St. Peter, near Cirencester, Gloucestershire.

H. Forest Marble. Bathonian.

Colln. L. Richardson.

Description (left valve).—A *Gervillia* characterized by seven transverse costæ. The shell is elongate, tapers posteriorly, and has a concave postero-dorsal margin. The cardinal margin is produced posteriorly and is approximately $\cdot 6$ of the length of the shell.

The hinge-area is large for the size of the shell and is traversed by three oblong ligamentary sulcations. The test is thick.

Measurements.—Length, 78 mm.; height, about 33 mm.; length of the hinge margin, 246 mm.

Remarks.—This species differs from *Gervillia crassica* Morris and Lycett, in having fewer ribs, no secondary ribbing, and in being more elongate.

GERVILLIA CRASSA James Buckman (*ex* Strickland MS.)
Pl. XXVIII., figs. 1a, b, c, and d.

T.d. 1844. "An Outline of the Geology of Cheltenham," 2nd ed., Appendix, p. 98.

T.f. *Ibid.*, tab. 10, fig. 9.

T.l. "Railway-cutting in several places between Gloucester and Bredon."

H. "Lias." [? Top of Sinemurian]

ŋ. [? *obtus-stellaris*]

Colln. Mus. Pract. Geol., Jermyn Street, London. [3684].

Type-description.—"Hinge-line a little more than half the length of the shell, teeth few, shell thick, very rugose."

Remarks.—The species differs from *Gervillia lævis* in being proportionately higher, in having a more sinuous antero-ventral margin and a more concave postero-dorsal margin, and in being more rounded at the posterior extremity.

Gervillia hagenowii Dunker¹ resembles this species. It may be distinguished therefrom by the antero-ventral margin, which, in *G. hagenowii* descends from the umbo for about half the length of the shell at an angle of approximately 50° with the hinge-line. In *G. crassa*, the antero-ventral margin makes an angle of from 60° to 70° with the hinge-line. This gives *G. crassa* a more quadrate appearance, and makes its anterior end less acuminate than in *G. hagenowii*.

¹ Ueber die in dem Lias bei Halberstadt vorkommenden Versteinerungen (1851), pp. 37-38, tab. vi., figs. 9-11.

The syntypes, of which there are two, are in Jermyn Street Museum (Nos. 3684 and 25177). They are from the "Lias, Railway cutting . . . between Gloucester and Bredon." No. 3684 is the specimen figured by Buckman and may be taken as the lectotype.

Owing to the indefiniteness of the locality given, it is impossible to determine the exact horizon of the beds from which these specimens were obtained. It may be stated, however, that probably the highest beds exposed during the construction of the railway (Midland) between Gloucester and Bredon were *armatum*-beds, and it is improbable that there were any seen of earlier date than *turneri*. Moreover, James Buckman on page 84 (*loc. cit. supra*) definitely gives Bredon as one of the localities at which this species was found, and it is known that the cutting at Bredon Station is in beds of about *obtus-stellaris* hemeræ.

Records.—Apart from the type-specimens only one other record of this species has come under my notice, namely that of a left valve from the beds of *oxynoti-armati* hemeræ at Gloucester Gas-works.

GERVILLIA CRASSICOSTA Morris and Lycett.

T.d. 1853. Monogr. Mollusca Gt. Oolite, pt. II., p. 23. Pal. Soc.

T.f. *Ibid.*, tab. II., fig. 9.

T.l. "Minchinhampton Common, [near Stroud, Gloucestershire]."

H. "Great Oolite." [Bathonian]

ŋ. ["*maxillatæ*"]

Colln. Mus. Pract. Geol., Jermyn Street, London. [9177]

Type-description.—"Test valde obliquâ elongatâ, convexiusculâ, auriculo antico rotundato, postico truncato et brevi; costis radiantibus subundatis, elatis majoribus 8, alternatim minoribus, et cum striis transversis numerosis, indentatis, latero postico elongato: valvâ dextrâ ignotâ."

"Shell very oblique, elongated, convex, anterior auricle rounded, posterior auricle short and emarginated; radiating costæ slightly waved, elevated, the larger, 8 in number, distant, and alternating with as many smaller, and impressed with numerous rather indistinct transverse striæ: posterior and inferior extremity elongated and slightly acuminate; right valve unknown.

"Of this rare species we have only obtained three examples; the hinge border is much shorter than in *Pteroperna costatula*, the posterior wing being but little produced; the whole contour of the shell is very oblique and the larger costæ are very prominent; the greater degree of obliquity, convexity and alternation of the costæ readily serve to distinguish it from *P. costatula*."

Record.—The holotype is the only specimen I have seen.

GERVILLIA FORNICATA Lycett. Pl. XXVIII., fig. 3.

T.d. 1857. "The Cotteswold Hills," p. 121.

T.f. [None given by Lycett. Type-figure Pl. XXVIII., fig. 3].

*T.l.*¹ "Nailsworth, Gloucestershire."

H. "Upper Lias." [Toarcian]

η. [*variabilis*]

Colln. Mus. Pract. Geol., Jermyn Street, London. [25183].

Type-description.—"Shell ovate, hinge line straight, oblique, lengthened; umbones acute, elevated, anterior auricle short, sloping somewhat downwards, dorsal surface very much elevated, and narrow, lines of growth numerous and faintly marked; antero-inferior border slightly sinuated; hinge plate narrow, sulcations numerous, irregular. The right or more flattened valve is unknown.

"*Gervillia glabrata*, Koch and Dunker [Versteinerungen des Norddeutschen Oolithgebildes, 1837, pp. 27-28, tab. II., fig. 1], approximates to this species in figure, but that shell is more elongated, less convex, has a shorter hinge line, and much larger folds of growth. It is rare.

"Position.—The *Cynocephala*-Stage.

"Locality.—Buckholt Wood."

Remarks.—This species is remarkable for the great convexity of the left valve.

Lycett did not figure any example of this species, nor did he mark any specimen as being that upon which he based his description. In the original description, he gives the horizon of his species as the "*Cynocephala*-Stage" and the locality as "Buckholt Wood" (*vide supra*). But there is no specimen in the Lycett Collection at the Museum of Practical Geology, Jermyn Street, from this horizon at this locality. There are, however, two specimens from Nailsworth which were originally in Lycett's possession. On p. 25 of his book "The Cotteswold Hills," he records this species from the "Basement Bed of the *Cynocephala*-Stage" at Nailsworth. This bed, which in the words of Lycett, "is a brown or chocolate coloured argillaceous sandstone," occurs a few feet above the base of the Cotteswold Sands, and Mr Richardson thinks is of about *variabilis* hemera.²

So the matter stands thus: the proterotype came from the Cephalopod-Bed (probably that portion which is of *moorei* date) of Buckholt Wood, but cannot now be found. It is described on p. 121 of Lycett's "Cotteswold Hills" Two specimens (idiotypes) are in the Museum of Practical Geology [25182, 25183] which were recorded on page 25 of the same

¹ Lycett's type cannot be found, therefore details are given concerning the lectotype.

² Proc. Cottesw. Nat. F.C., vol. xvii., pt. 1 (1910), p. 127.

work. They are both labelled "*Gervillia fornicata* Lyc., Sands, Nailsworth," but the less well-preserved one, 25182, has, in addition, the item "Handbook p. 121." It should have been "p. 25."

It is proposed to select the better preserved specimen [25183] as the standard of reference for the species. It consists of a left valve (see pl. xxviii., fig. 3), very convex, having a maximum diameter of 11 mm. The antero-ventral margin is almost straight, and makes an angle of 45° with the hinge-line; the postero-dorsal margin is slightly concave. Two obscure, but apparently circular, ligamentary pits can be made out on the hinge behind the umbo.

Only one right valve of the species has been examined. This is on a specimen in Mr Richardson's collection from the Cephalopod-Bed (*moorei*) at Coaley Wood, near Stroud; it is not well exhibited, but appears to be rather less convex than the left valve.

Gervillia oblonga Moore (Proc. Somerset. Archæol. and Nat. Hist. Soc., vol. xiii., 1867, p. 216, pl. 7, fig. 11) appears from the figure to be closely related to *G. fornicata*.

Records.—*Variabilis*-Beds, Hartley Cottages well, Leckhampton Hill, Cheltenham (L. R.—bed 5, Geol. Mag., 1910, p. 103); *Variabilis*-Beds, Nailsworth (idiotype locality); Cephalopod-Bed (*moorei*), Coaley Wood, near Dursley (L. R.; Proc. Cottesw. Nat. F. C., vol. xiii., pt. 1, 1910, p. 115).

GERVILLIA ISLIPENSIS Lycett. Pl. xxix., fig. 4.

T.d. 1863. Lycett, Suppl. Monogr. Moll. Gt. Ool., p. 37.

T.f. *Ibid.*, tab. XL., fig. 35.

T.l. "Stonesfield, Oxfordshire."

H. "Stonesfield Slate." [Bathonian]

ŋ. [*gracilis*]

Colln. Mus. Pract. Geol., Jermyn Street, London. [9179].

Remarks.—This fossil is poorly preserved and probably came from one of the softer layers associated with the Stonesfield Slate-series. Lycett records it also from the Cornbrash of Islip, Oxfordshire, but this specimen appears to be lost.

This species is mentioned here because it should be found in the basal Great Oolite of Gloucestershire and better preserved specimens are desired.

GERVILLIA LÆVIS James Buckman. Pl. XXVIII., figs. 2a, b.

T.d. 1844. "An Outline of the Geology of Cheltenham," 2nd ed., Appendix, p. 98.

T.f. *Ibid.*, tab. 10, fig. 8.

T.l. "Foot of Battledown Hill, Hewlett's Road [Cheltenham, Gloucestershire]."

H. "[Lower] Lias." [Pliensbachian]

η. [*striati*]

Colln. Mus. Pract. Geol., Jermyn Street London. [3683].

1904. *Gervillia lævis* J. Buckman, L. Richardson, "Handbook to the Geology of Cheltenham," pp. 45 and 221, pl. XV., fig. 4.

Type-description.—"Hinge line a little more than one-third the length of the shell, teeth few, but narrower than in the preceding [*Gervillia crassa*], shell slightly curved, very smooth and thin, anterior extremity rather pointed."

Remarks.—The holotype is preserved in the Museum of Practical Geology [3683], and is from the *Striatum*-Beds of the Lower Lias at Battledown, Cheltenham.

As shown by the measurements given below, the length of the hinge-line relative to the length of the shell is .62 or .69, (according as the "length" is measured parallel to the hinge-line or diagonally from the anterior to the posterior end) and not "a little more than one third" as stated by Buckman. The "teeth" referred to in the protolog are the ligamentary grooves.

At certain localities (given below) there occurs an abundance of a small form of *Gervillia lævis*. These may be either immature examples of the species or a dwarf variety; there is not yet sufficient evidence to justify a decision. Typical examples of *G. lævis* occur at the same horizon, but have not been found associated with the small form.

The following are the measurements of four specimens: —

Specimen	Length	Height	Diameter	Hinge-line
(1)	58.5	29.5	16+	ca. 30
(2)	47	29	16	ca. 27
(3)	40+	23.5	10	ca. 20
(4)	34+	19	—	21

Specimen No. 2 is the holotype; Nos. 1 and 3 are topotypes; and No. 4 is a specimen from the *Capricornus*-Beds at Pilford, Cheltenham. Six of the small forms mentioned above

from the *Capricornus*-Beds were also measured, and the results showed the mean values of the ratios height/length and hinge-line/length to be .64 and 1.03, respectively. The hinge is thus relatively longer than in mature forms of *Gervillia lævis*, but from observations on the halt-lines of the latter, it appears to be about the same as it would be in specimens of *G. lævis* of corresponding size. None of the small forms has been known to exceed 13.5 mm. in length.

Gervillia betacalcis Quenstedt (Der Jura, 1856, tab. 12, fig. 19) resembles this species, but appears to be a shorter and more rounded form. Quenstedt's figure depicts a damaged specimen which does not show the slight byssal sinus which is always present in mature forms of *G. lævis*.

Records.—*Striatum*-Beds, Battledown Brickworks, Cheltenham (common ; type-locality) : *Striatum*- or *Capricornus*-Beds (probably latter), Prestbury (well at Queen's-Wood Cottages), near Cheltenham : Pilford, Cheltenham : and in the Railway-cutting (G.W.R.), Greet, near Winchcombe. The small forms occur in abundance in beds of *capricornus* hemera at Aston-Magna Brickworks, near Moreton-in-the-Marsh : Robins' Wood Hill, near Gloucester, and at Dumbleton Brickyard, near Beckford.

GERVILLIA LATA J. Phillips. Pl. xxviii., figs. 4a, b and c.

T.d. 1829. Geology of Yorkshire, pt. I., p. 156.

T.f. *Ibid.*, pl. xi., figs. 16 and 17.

T.l. "Blue Wick [Ravenscar, Yorkshire]."

H. "I[nferior] O[olite. Dogger]" [Aalenian]

ŕ. [*murchisonæ*]

Colln. York Museum.

1835. Phillips, Geol. Yorksh., pt. I., (2nd ed.), p. 128., pl. xi., figs. 16, 17.

1875. Phillips, *ibid*, 3rd ed., p. 247, pl. XI., figs. 16 and 17.

Remarks.—In the third edition of Phillips' work, two views of this fossil are given : one a general view of the specimen ; the other of the hinge-area—but magnified, and showing the ligamentary pits. The specimen in the York Museum, however, does not exhibit these pits and therefore, presumably, the specimen is not the holotype, but a syntype. It is desirable to make it the lectotype. It came from the red Dogger of Blea Wyke, below Ravenscar, and has the following measurements : length (parallel to the hinge-line), 47 mm. ; height, 32 mm. ; diameter, 19 mm. ; length from anterior to posterior extremity, 51 mm. The left valve is more convex than the right and overlaps along the ventral margin.

Records.—Phillips records this form from the Millepore Oolite of Clough-ton as well, but I have not seen this specimen. In Gloucestershire, Mr Richardson has collected a specimen from the Pea-Grit (*murchisonæ*) of Crickley Hill; Lycett records it from the Inferior Oolite of Minchinhampton (Proc. Cottesw. Nat. F. C., vol. i., 1853, p. 74); while Witchell records it from the Oolite Marl of the Stroud district, but misled by its form assigned it to the genus *Pteroperna* (Geol. Stroud, 1882, p. 51).

GERVILLIA MONOTIS Eudes-Deslongchamps.

Pl. XXIX., fig. 3.

T.d. 1824. Mem. Soc. Linn. du Calvados vol. I., p. 130.

T.f. *Ibid.*, pl. V., figs. 1 and 2.

T.l. ———

H. ———

η. ———

Colln. ———

1853. *Gervillia monotis* Deslongchamps, Morris and Lycett, Monogr. Moll. Gt. Ool., pt. II., pp. 22-23, tab. II., figs. 14, 14a, and 146. Pal. Soc.

1882. *Gervillia monotis* Deslongchamps, E. Witchell, Geol. of Stroud, p. 80, pl. 3, fig. 24.

Record.—Great Oolite, Minchinhampton Common, near Stroud (appears to be fairly common).

GERVILLIA "ORNATA" Lycett.

T.d. 1863. Suppl. Monogr. Moll. Gt. Ool., p. III. Pal. Soc.

T.f. *Ibid.*, tab. XXXVI., fig. 7.

T.l. "Minchinhampton, near Stroud."

H. "Great Oolite." [Bathonian].

η. ["*maxillatæ*"]

Colln. Mus. Pract. Geol., Jermyn Street, London. [9176.]

Non 1861. *Gervillia ornata* Moore, Quart. Journ. Geol. Soc., vol. xvii., p. 500.

Remarks.—The name *Gervillia ornata* was applied to a Rhætic species by Charles Moore in 1861, and therefore when used by Lycett was preoccupied. Edward Wilson ("List of Fossil types and Described Specimen in the Bath Museum," Proc. Bath Nat. Hist. and Antiqu. F. C., vol. vii., 1892, p. 50) regarded *G. ornata* Moore as synonymous with *G. faberi* Winkler. If this is the case, then the name *G. ornata* may be retained for the Great Oolite species. There is some doubt as to whether the specimen quoted above is really the type of the species.

Record.—Great Oolite, Minchinhampton, near Stroud.

GERVILLIA PRÆLONGA Lycett.

T.d. 1857. "The Cotteswold Hills," p. 127.

T.f. *Ibid.*, pl. VI., fig. 6.

T.l. "Rodborough Hill, [Stroud, Gloucestershire]."

H. "The *Spinosa*-Stage of the Inferior Oolite in the Gryphite-Grit [Lower *Trigonia*-Grit]." [Bajocian]

ŷ. [*discitæ*]

Colln. Mus. Pract. Geol., Jermyn Street, London. [1886].

Remarks.—This species is closely allied to *Gervillia subcylindrica* Morris and Lycett and to *G. acuta* Sowerby. From the former it is distinguished by the greater curvature of the shell—*G. subcylindrica* being almost straight. *G. acuta* appears never to attain the size of *G. prælonga*, has a relatively shorter hinge-line, is higher, and more pointed at its posterior extremity.

Collectors in the Cotteswolds have often referred the right valve of this species to *Gervillia acuta* Sowerby, to which it bears a strong resemblance.

The specimen figured by Lycett is a left valve from the Lower *Trigonia*-Grit¹ of Rodborough Hill, near Stroud. It has the following dimensions:—length, ca. 146 mm.; height ca. 38 mm.; hinge-line, ca. 83 mm.

Records.—*Clypeus*-Grit (*schlænbacki*), Rolling Bank Quarry, Cleeve Hill, near Cheltenham; Notgrove Freestone (*witchellia*), Leckhampton; *Witchellia*-Grit (*witchellia*), Cold Comfort, near Cheltenham; Buckmani-Grit (*post-discitæ*), Cleeve Hill, near Cheltenham; Tuffley's Quarry, near Crickley Hill, and Charlton Common, near Cheltenham; Lower *Trigonia*-Grit (*discitæ*), Rodborough Hill, near Stroud; Leckhampton Hill, Charlton Common, and Wistley Hill, near Cheltenham.

GERVILLIA SUBCYLINDRICA Morris and Lycett

T.d. 1853. *Mongr. Moll. Gt. Ool.*, pt. II, p. 21. Pal. Soc.

T.f. *Ibid.*, tab. III., figs. 13, 13a and b.—"*Gervillia subcylindrica* ? var. of *Gervillia acuta* Sow."

T.l. "Minchinhampton Common, where it occurs somewhat rarely in the

H. "planking [Great Oolite]" [Bathonian]

ŷ. [? *maxillatæ*]

Colln. Mus. Pract. Geol., Jermyn Street, London. [1881, 1882]

Remarks.—The two specimens figured by Morris and Lycett (*op. cit.*, tab. III., figs. 13, 13a) may be taken as the syntypes of the species. They are in Jermyn Street Museum and are registered as No. 9182 (right valve; fig. 13) and No. 9181 (left valve; fig. 13a). The matrix is the characteristic "Minchinhampton Stone" of the Minchinhampton Beds.

Record.—Minchinhampton Common, near Stroud.

GERVILLIA TORTUOSA (J. de C. Sowerby)

T.d. 1826.¹ *Gastrochæna tortuosa* J. de C. Sowerby, *Min. Conch* vol. vi., p. 49.

T.f. *Ibid.*, tab. DXXVI., fig. 1.

T.l. "Blea Wyke" [Ravenscar, Yorkshire].

H. "Dogger" [*Nerinæa*-Bed. Aalenian].

ŋ. [*murchisonæ*].

Colln. Sowerby Colln., Brit. Mus. Nat. Hist., London. [43007].

1829. *Gastrochæna tortuosa* Sow., J. Phillips. *Geol. of Yorksh.*, pt. I., (1st ed.), p. 155, pl. XI., fig. 36.

1835. *Gastrochæna tortuosa* Sow., J. Phillips, *Geol. Yorksh.*, pt. I., (2nd ed.), p. 157, pl. XI., fig. 36.

1842-44² *Gastrochæna tortuosa* Sow., *Conchyliologie Minéralogique de la Grand Bretagne* (French edition of Sowerby's *Min. Conch.*), translated by E. Desor. with notes by L. Agassiz, p. 540, tab. DXXVI., figs. 1-3.

1842-45² *Gastrochæna tortuosa* Sow., *Mineral-Conchologie Grossbritannienens* (German edition of Sowerby's *Min. Conch.*), by E. Desor. and L. Agassiz, p. 548, tab. DXXVI., figs. 1-3.

1853. *Gervillia tortuosa* Phillips, J. Lycett, "The Cotteswold Hills," pp. 48, 56 and 64.

1875. *Gervillia tortuosa* Phill., R. Etheridge in J. Phillips, *Geol. Yorksh*, pt. I. (3rd ed.) p. 247, pl. XI., fig. 36.

1882. *Gervillia tortuosa* Phillips, E. Witchell, "Geol. of Stroud," pp. 48, 52 and 59.

Remarks.—The type-specimen in the Sowerby Collection at the British Museum (Nat. Hist.) came from the *Nerinæa*-Bed in the Dogger at Blea Wyke.

¹ I am indebted to Mr C. D. Sherborn for directing my attention to a pamphlet by Renevier (*Bull. Soc. vaud. des Sci. nat.*, vol. IV., No. 36, 1855, pp. 318-320) in which the exact dates of publication of the various parts of Sowerby's *Min. Conch.* are worked out.

² These dates are given on the authority of Mr C. D. Sherborn.

There are many records of this characteristic species from Gloucestershire, although it cannot be said to be common.

Records.—Pea-Grit (*murchisonæ*), Crickley Hill, near Cheltenham; Harford Sands (*concavi*), Cleeve Hill, near Cheltenham. Pisolite and Freestones, Stroud (*teste* Witchell); Oolite Marl (*bradfordensis*), Selsley Hill, near Stroud (*teste* Lycett); "Gryphite-Grit" [Lower *Trigonia*- or *Buckmani*-Grit] (*discitæ*), near Stroud (*teste* Lycett and Witchell).

GERVILLIA WALTONI Lycett. Pl. XXIX., figs. 2*a*, *b* & *c*.

T.d. 1863. Suppl. Monogr. Moll. Gt. Ool., pp. 110-111. Pal. Soc.

T.f. *Ibid.*, tab. XXXII., figs. 4, 4*a* and 4*b*.

T.l. "Farley, Gastard."

H. "Forest Marble." [Bathonian].

ŋ. ["*coarctatæ*"]

Colln. Sedgwick Museum, Cambridge.

Remarks.—The syntypes of this species, three in number, are from the Forest Marble—the label on the tablet to which they are attached bearing the localities "Farley, Gastard" One specimen (fig. 4*a* of Lycett) is in addition labelled "Farley," which is near Bath. The other two are unlabelled and may be from either Farley or Gastard, Wiltshire.

Records.—*Gervillia*-Bed, Great Oolite, Stow-Road and Wiggold Railway-cuttings, between Foss Cross and Cirencester; "Great Oolite 17" [*? Gervillia*-Bed], Stoney Furlong Railway-cutting, near Chedworth.

GERVILLIA WHIDBORNEI nom. nov. Text-figs. 1*a* & *b*.

T.d. 1883. Quart. Journ. Geol. Soc., vol. xxxix., pp. 516-517.

(*Sub Gervillia intermedia*).

T.f. *Ibid.*, pl. XVI., figs. 8 and 9.

T.l. "Bradford Abbas, [near Sherborne, Dorset]."

H. [Inferior Oolite]. [Aalenian].

ŋ. [probably *concavi* or *discitæ*].

Colln. Sedgwick Museum, Cambridge.

Syn. 1844. *Gervillia hartmanni* Goldfuss, J. Buckman in Murchison's Geol. of Cheltenham, 2nd ed., p. 75 and tab. 7, fig. 4.

1883. *Gervillia intermedia* Whidborne, *loc. cit. supr.*

Remarks.—The specific name *intermedia* was applied by Wissmann and Münster in 1841 to a *Gervillia* from the St. Cassian Beds¹; it has therefore been necessary to re-name Whidborne's species.

This species, which is abundant in the Buckmani-Grit of the Cotteswold Hills, resembles *Gervillia hartmanni* Münster

¹ Beitr. Geogn. und Petref.-kunde des Südöstlichen Tirol's vorzüglich der Schichten von St. Cassian (1841), p. 80.

(Goldfuss, Petref. Germ., 1862, pp. 115-116, tab. cxv., fig.) under which name it appears to have been frequently recorded. It differs from that species, however in being more inæquivalve—a fact noted by Whidborne.

Whidborne remarks that it

"may possibly agree with *G. fornicata*, Lycett, . . . but seems to differ in wanting the sinuations in the infero-anterior border, and being less oblique."

It may be noted that *G. fornicata* is also a more convex form, and appears to be almost equivalve.

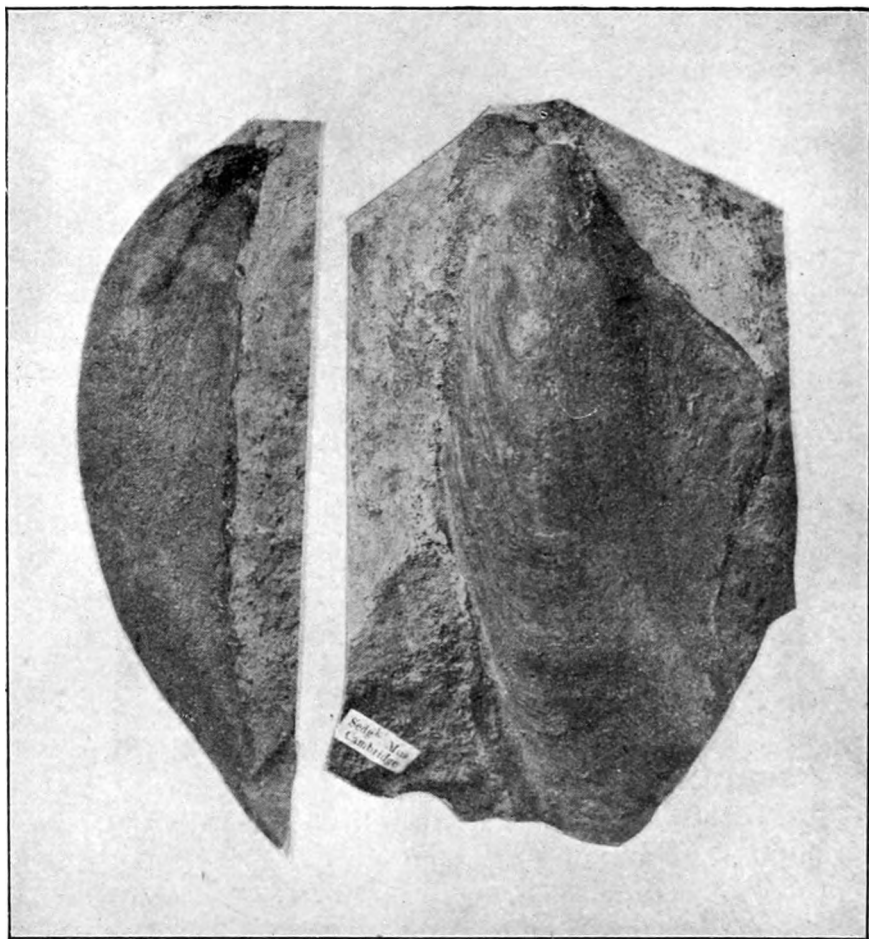


Fig. 1.—*Gervillia whidbornei* nom. nov.

Of the two specimens figured by Whidborne, fig. 8 represent one from the Cotteswold Sands at Frocester Hill, and fig. 9 one from an ironshot bed (probably of *concavi* or *discitæ* hemera) in the Inferior Oolite of Bradford Abbas. They are in the Sedgwick Museum, Cambridge.

In Text-fig. 1 Whidborne's fossil from Bradford Abbas is refigured under its new name.

Records.—*Buckmani*-Grit (*post-discitæ*), Leckhampton Hill, Charlton Common, and Roadstone Hole, Cleeve Hill; Lower *Trigonia*-Grit (*discitæ*), Frith Quarry, near Painswick; Cotteswold sands (*variabilis*), Frocester Hill, near Gloucester.

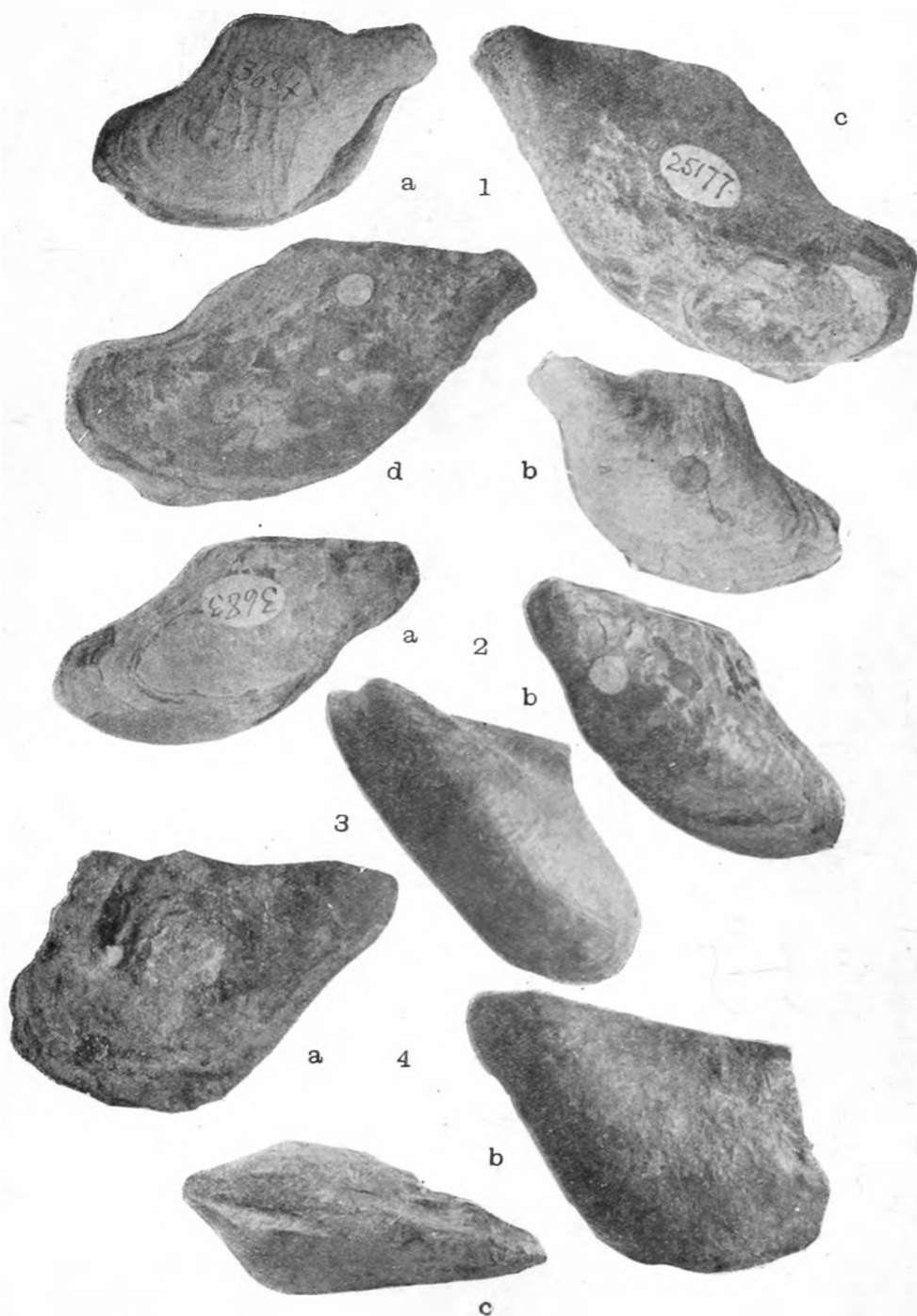


Photo. E. T. Paris.

EXPLANATION OF PLATE XXVIII.

Figs. 1a-d.—GERVILLIA CRASSA J. Buckman

1a = right valve of lectotype ; 1b = left valve of lectotype ;
1c = left valve of syntype ; 1d = right valve of syntype.

Horizon : Lower Lias (? top of Sinemurian).

Locality : " Railway cutting . . . between Gloucester and Bredon."

Collection : Mus. Pract. Geol., Jermyn Street, London. [Reg. Nos. 3684
(lectotype) and 25177 (syntype)].

Figs. 2a and 2b.—GERVILLIA LÆVIS J. Buckman

2a = right valve of holotype ; 2b = left valve of holotype.

Hor. : *Striatum*-Beds of the Lower Lias, Pliensbachian.

Loc. : Battledown, Cheltenham.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 3683].

Fig. 3.—GERVILLIA FORNICATA Lycett

Left valve of idio-type.

Hor. : Upper Lias. Toarcian.

Loc. : Nailsworth, Gloucestershire.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 25183].

Figs. 4a-c.—GERVILLIA LATA Phillips

4a = right valve of lectotype ; 4b = left valve of lectotype ;

4c = dorsal view of lectotype.

Hor. : Dogger (Inferior Oolite). Aalenian.

Loc. : " Blue Wick [Ravenscar, Yorkshire]."

Colln. : The Museum, York.

(All the figures are about natural size).

EXPLANATION OF PLATE XXIX.

Figs. 1a and 1b.—*GERVILLIA CORINIENSIS* sp. nov.

1a = left valve of holotype ; 1b = hinge of left valve of holotype, showing ligamentary grooves.

Hor. : Forest Marble. Bathonian.

Loc. : Near Cirencester.

Colln. : L. Richardson.

Figs. 2a-c.—*GERVILLIA WALTONI* Lycett

External views of the syntypes (three left valves).

Hor. : Forest Marble. Bathonian. —

Loc. : Farley.

Colln. : Sedgwick Museum, Cambridge.

Fig. 3.—*GERVILLIA MONOTIS* Eudes-Deslongchamps.

External view of the left valve figured by Morris and Lycett, Monogr.

Moll. Gt. Ool., tab. II, figs. 14a and 14b.

Hor. : Great Oolite. Bathonian.

Loc. : Minchinhampton Common, near Stroud.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 9178].

Fig. 4.—*GERVILLIA ISLIPENSIS* Lycett

Left valve of holotype.

Hor. : Stonesfield Slate. Bathonian.

Loc. : Stonesfield, Oxfordshire.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 9179].

Fig. 5.—*GERVILLIA COMPRESSA* Whidborne.

Left valve of holotype.

Hor. : Inferior Oolite. Aalenian.

Loc. : Nailsworth, Gloucestershire.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 8863].

Fig. 6.—*GERVILLIA AURITA* Lycett

Left valve of holotype.

Hor. : Inferior Oolite. Aalenian.

Loc. : Nailsworth, Gloucestershire.

Colln. : Mus. Pract. Geol., Jermyn Street, London. [Reg. No. 8862.]

(All the figures are about natural size).

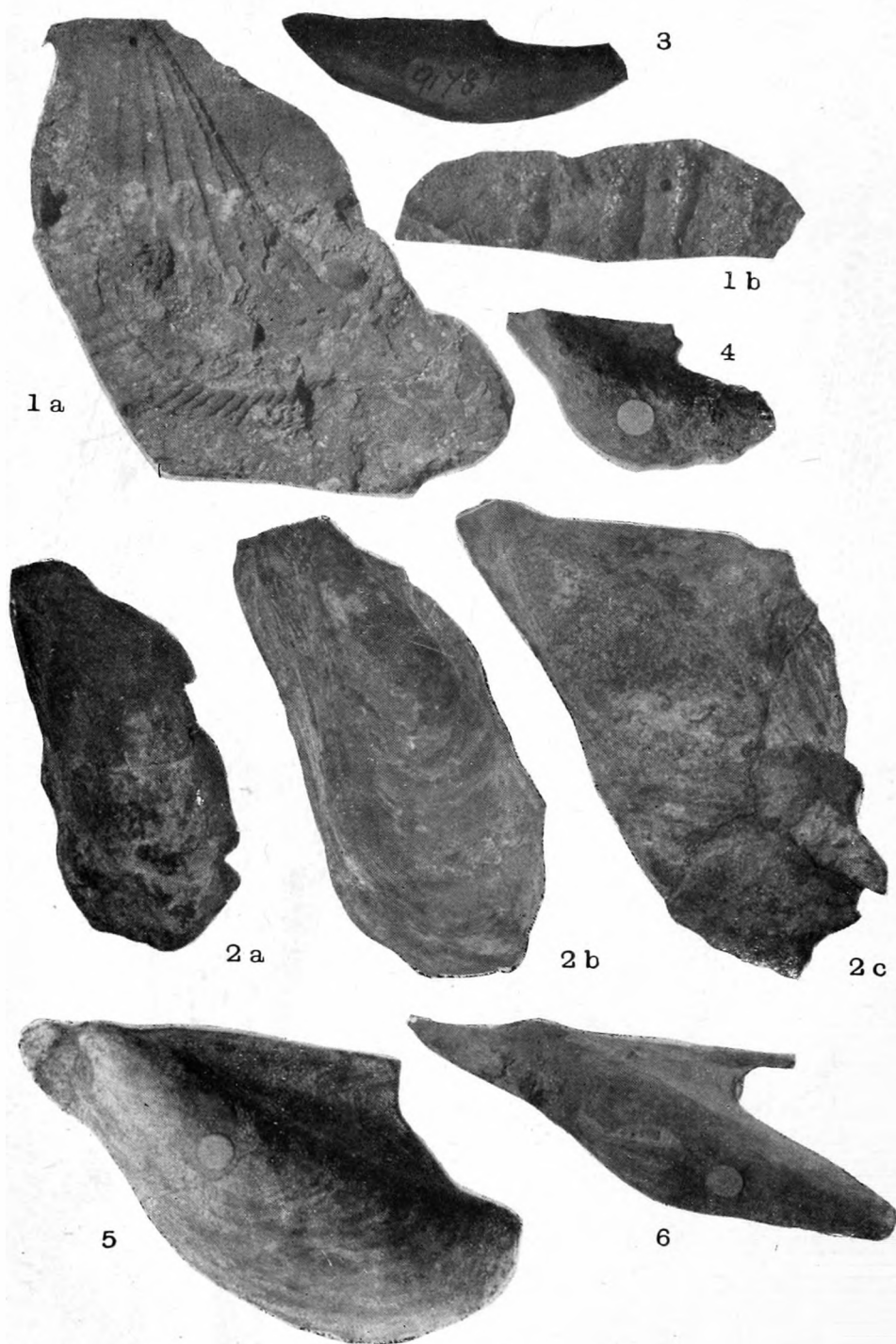


Photo. E. T. Paris.

FOREST-MARBLE, GREAT-OOLITE AND INFERIOR-OOLITE GERVILLIÆ

NOTE ON GERVILLIA ACUTA AUCTT. NON SOWERBY
(GERVILLIA SCARBURGENSIS NOM. NOV)

FROM
THE SCARBOROUGH LIMESTONE

By E. TALBOT PARIS, F.C.S.

GERVILLIA SCARBURGENSIS nom. nov.

T.f. 1853. Morris and Lycett, Monogr. Moll. Gt. Oolite, pt. II.,
tab. xiv., figs. 1 and 1a (*sub Gervillia acuta* Sowerby).

T.l. "Scarborough, Yorkshire."

H. "Scarborough Limestone." Bajocian.

ŋ. ? *blagdeni*.

Colln. Leckenby Collection, Sedgwick Museum, Cambridge.

Syn. 1829. *Gervillia acuta* Sow., Phillips, Geol. Yorksh., pt. I.,
pl. IX., p. 151, fig. 36.

1835. *Gervillia acuta* Sow., Phillips, *ibid.*, p. 123, pl. IX.,
fig. 36.

1853. *Gervillia acuta* Sow., Morris and Lycett, Monogr. Moll.
Gt. Oolite, pt. II., p. 142, tab. xiv., figs. 1 and 1a (*non*
p. 20, tab. III., figs. 12 and 12a).

1875. *Gervillia acuta* Sow., Phillips, Geol. Yorksh., pt. I.,
(3rd ed.), p. 247, pl. IX., fig. 36.

Non 1826. *Gervillia* ? *acuta* Sow. Min. Conch., vol. VI., p. 15, tab.
DX., fig. 5.

1853. *Gervillia acuta* Sow., Morris and Lycett, Monogr. Moll,
Gt. Oolite, pt. II., p. 20, tab. iii., figs. 12 and 12a.

Remarks.—*Gervillia scarburgensis* is broad and somewhat
spathulate posteriorly, and this feature serves to distinguish
it from *G. acuta* Sow., which has a subacuminate posterior
extremity and is a relatively more elongate form, and appears

never to attain the size of the average example of *G. scarburgensis*. Moreover the hinge-margin is relatively longer than in *G. acuta*, the ratio hinge-line/length being about .57 for *G. scarburgensis* whereas it is .46 for *G. acuta*.

It is allied to *Gervillia praelonga* Lycett and *G. subcylindrica* Morris and Lycett, from both of which it is distinguished by its greater height, its broad posterior portion, and the greater convexity of its ventral margin.

The right valve figured by Phillips (*loc. cit. supra*) from the Scarborough Limestone belongs to this species, though Phillips' figure makes the shell appear rather too cylindrical. Several specimens in York Museum which were named *Gervillia acuta* Sow., by Phillips have been examined and compared with the types of *G. scarburgensis*, but it has not been possible to identify any particular specimen as that actually figured by Phillips.

Münster (in Goldfuss) appears to have recognised the difference between *Gervillia acuta* Sow. and Phillips' interpretation of that species, for he cites "*Gervillia acuta*, Phillips" as synonymous with his *G. lanceolata*.¹ (Petref. Germ., p. 123, tab. cxv., fig. 9). The latter species, however, cannot be regarded as identical with *G. scarburgensis*.

The specimens selected as syntypes are the two figured by Morris and Lycett (*loc. cit. supra*) as *Gervillia acuta* Sow., and are now in the Leckenby Collection, Sedgwick Museum, Cambridge. They are from the Scarborough Limestone at Scarborough.

¹ The specific name *lanceolata* was used by Sowerby in 1826 (Min. Conch., vol. VI., p. 17, tab. DXII. fig. 1) for a species which he referred to *Avicula* [*Pteria*], but which must, I think, be referred to *Gervillia*. The absence of the ligament-pits from the type of "*Avicula*" *lanceolata* Sow. seems to be a matter of preservation, and while there are many similar sabre-like shells which are undoubtedly *Gervillias*, there is none, so far as I know, referable to *Pteria*. Nevertheless, Mr E. T. Newton (Quart. Journ. Geol. Soc., vol. lvii., 1901, p. 232) prefers to retain this species in the genus *Avicula* [*Pteria*].