

VISÉAN TRILOBITES FROM HOLWELL, SOMERSET

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ABSTRACT. Three species of trilobites from the Clifton Down Limestone (Viséan) at Holwell Quarry in the Mendip Hills (Somerset) are described: *Linguaphillipsia matthewsi* sp. nov., *Phillipsia (Phillipsia) holwellensis* sp. nov., and *Cunningella jonesi jonesi* (Portlock 1843). This is the first record of the genus *Linguaphillipsia* Stubblefield 1948 from the Carboniferous Limestone of western Europe.

THE stratigraphical relationships and age of trilobites from the Carboniferous Limestone facies of the Lower Carboniferous are still poorly known, certainly so when compared with what is known about trilobites in the Culm facies (G. and R. Hahn 1971).

A recently discovered fauna from low in the Clifton Down Limestone (Viséan) at Holwell Quarry, Somerset (ST 727 452), includes three species of trilobite, the subject of this paper. Dr. S. C. Matthews (University of Bristol) is working on other aspects of the rich fauna. The thirty trilobite specimens are well preserved and partly silicified. They belong to three species: *Linguaphillipsia matthewsi* sp. nov., *Phillipsia (Phillipsia) holwellensis* sp. nov., and *Cunningella jonesi jonesi* (Portlock 1843). The majority of the specimens belong to *L. matthewsi*, five (pygidia only) to *P. (P.) holwellensis*, one (a pygidium) to *P. (P.)* cf. *holwellensis*, and two (one pygidium, one fragment of a free cheek) to *C. jonesi jonesi*.

The specific composition of the trilobite fauna is surprising as only one of the three species, *C. jonesi jonesi*, belongs to a characteristic western European genus. *L. matthewsi* is the first record of this genus in western Europe and specifically is closest to *L. ohmorensis* (Ohkubo 1951) from Japan. Although *Phillipsia (Phillipsia)* is a common subgenus in the Lower Carboniferous of western Europe *P. (P.) holwellensis* is closest to *P. (P.) conserrata* Weber 1937 from the ?Viséan of the southern Urals.

Acknowledgements. We are grateful to Dr. S. C. Matthews (University of Bristol) for making available to us material originally discovered by Dr. N. H. Trewin (University of Aberdeen) and to Mr. R. G. Godwin for the excellent photographs.

Repository. The material is deposited in the Geology Museum, University of Bristol, and bears the numbers BU 21000-21030. Indeterminable fragments are unnumbered.

DESCRIPTIONS

Family PROETIDAE Hawle and Corda 1847
Subfamily LINGUAPHILLIPSINAE G. and R. Hahn 1972
Genus LINGUAPHILLIPSIA Stubblefield 1948

Type species. *Linguaphillipsia terapaiensis* Stubblefield 1948.

Diagnosis. Treatise, p. 401, and G. and R. Hahn 1972, p. 360 ('Beziehungen').

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Linguaphillipsia matthewsi sp. nov.

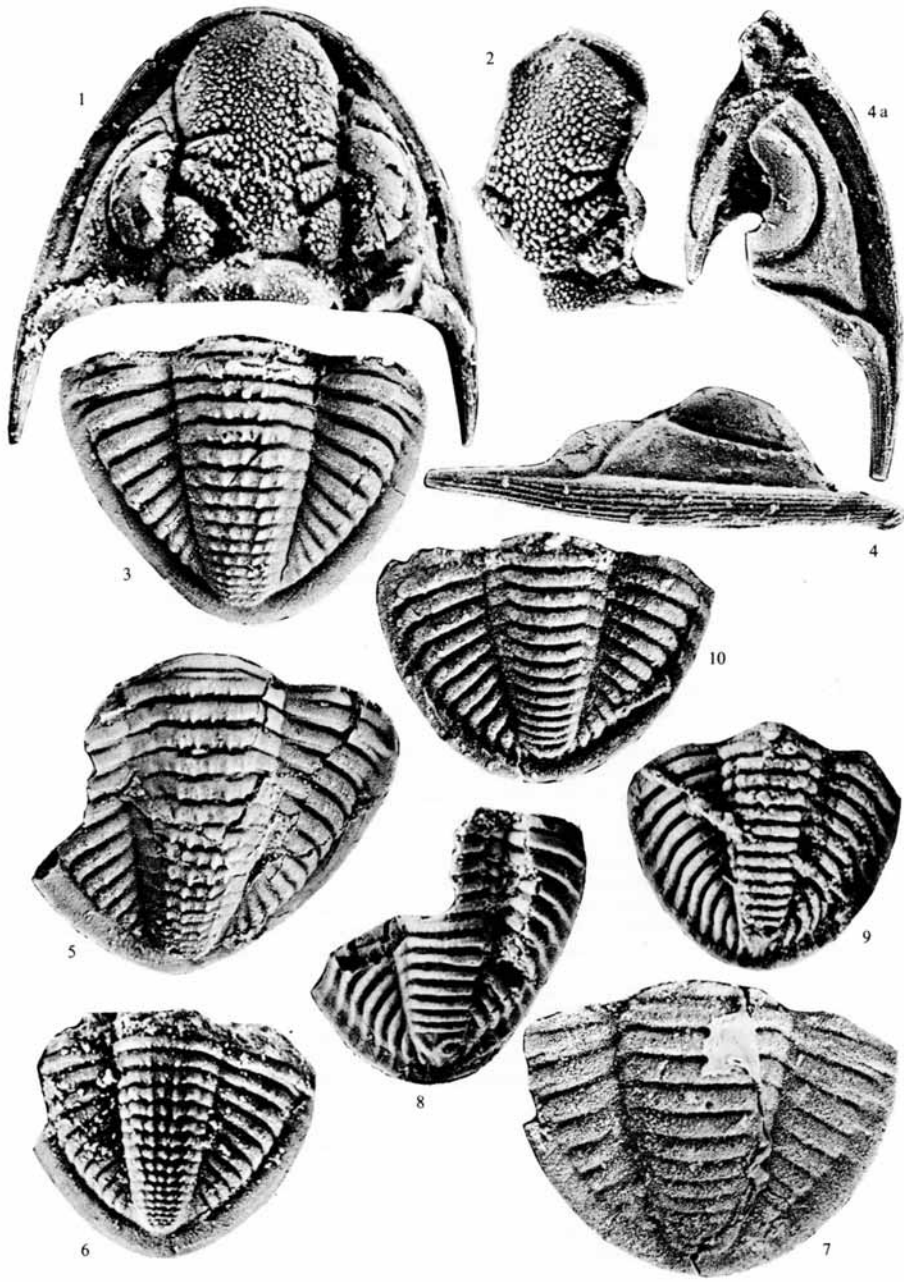
Plate 64, figs. 1-6; text-figs. 1-2

Derivation of name. After Dr. S. C. Matthews.*Holotype.* Cephalon BU 21000; Pl. 64, fig. 1; text-fig. 1.*Type locality.* Holwell Quarry, Somerset, England (National Grid Reference ST 727 452).*Type horizon.* Clifton Down Limestone, Viséan.*Distribution.* Known only from type locality and type horizon.*Paratypes.* Four fragments of cranidia (BU 21001-21004), four free cheeks (BU 21005-21008), 2 fragmentary free cheeks (BU 21009-21010), 4 pygidia (BU 21019-21022), 7 thoracic segments, complete or broken (BU 21011-21018).*Diagnosis.* A species of *Linguaphillipsia* with the following characteristics. Glabella long, partially overhanging the anterior border, markedly constricted between γ - γ , between δ - δ only slightly broader than between β - β . Palpebral lobes situated posteriorly, long facial suture without a straight portion between ϵ - ζ . Eyes large, genal spines medium in length. Pygidium slightly triangular in outline, with 17-18 rings and 10-12 ribs on each pleura. Border of medium breadth, separated by a well-impressed border furrow. Relief and sculpture (nodes) on the cephalon and pygidium well marked.*Description.* *Cephalon* (holotype, external mould, BU 21000). Lateral view (text-fig. 1*b*). Glabella rising above anterior border, continuously curved to a point near occipital furrow; occipital furrow well incised. Occipital ring somewhat higher than glabella, reaching highest point in occipital node, situated near posterior margin. Border vertical on cranidium, overlapped by glabella, ornamented along its total length by 7-8 parallel lines which extend on to genal spine. Free cheek strongly vaulted, eye large, rising somewhat posteriorly.Dorsal view (Pl. 64, fig. 1; text-fig. 1*a*). Outline oval, only slightly broader than long (without genal spines). Glabella long, tongue-like in shape, extending forward almost to anterior margin, markedly constricted at γ . Anterior part well rounded and arched, posterior part flatter and broader than anterior part, greatest breadth between δ - δ . Glabellar furrows (1p-3p) deeply incised. 1p strongly curved backward, cutting preoccipital lobes (L1) out of glabella, and extending to occipital furrow. 2p-3p short; 2p directed slightly backward, but 3p directed slightly forward. Occipital furrow nearly straight (tr.), with only slight backward curvature behind L1 on each side. Occipital ring heavily arched in its centre, but immersed on each side behind L1. Dorsal furrows deeply incised. Fixed cheek with very long, moderately diverging anterior

EXPLANATION OF PLATE 64

Figs. 1-6. *Linguaphillipsia matthewsi* sp. nov. 1. Cephalon, holotype, $\times 5.9$ (BU 21000). 2. Cranidium, (broken during transport after photographing, therefore without number and scale). 3. Large pygidium, $\times 7.7$ (BU 21020). 4. Free cheek, $\times 6.0$ (BU 21005). 4*a*, Dorsal view; 4*b*, Lateral view. 5. Large pygidium, $\times 5.5$ (BU 21021). 6. Medium sized pygidium, $\times 4.8$ (BU 21019).Fig. 7. *Cummingella jonesi jonesi* (Portlock 1843). Pygidium, right pleural lobe (broken during transport after photographing), $\times 5.2$ (BU 21029).Figs. 8-9. *Phillipsia (Phillipsia) holwellensis* sp. nov. 8. Pygidium, $\times 2.9$ (BU 21024). 9. Pygidium, right pleural lobe (broken during transport after photographing), $\times 3.2$ (BU 21025).Fig. 10. *Phillipsia (Phillipsia) cf. holwellensis* sp. nov. Pygidium, left pleural lobe (broken during transport after photographing), $\times 6.8$ (BU 21028).

All specimens from Viséan at Holwell, Somerset.



G. and R. HAHN, trilobites from Holwell

part (γ - β), long palpebral lobe, and short posterior part. β situated anteriorly, rounded; γ , δ , and ϵ also gently rounded, no straight portion ϵ - ζ evolved. Posterior part of fixed cheek short (exsag.), medium in length (tr.). β situated slightly inward of δ . Border of the free cheek relatively broad, limited by a distinct border furrow. Striations of the border only partly visible. Free cheek ascending rapidly from inner side of border to eye; eye socket separated by a well-marked eye furrow. Eye large, strongly curved, lenses not preserved. Posterior border of free cheek separated by deeply incised border furrow, which extends laterally to meet outer border furrow, then curves backwards into shallow spinal furrow. Genal spine of medium length, sharply pointed, ornamented with some striations, divided longitudinally by spinal furrow into two portions. Internal portion rounded, larger and more elevated than external portion, which diminishes towards tip of spine. Surface of glabella covered by coarse nodes; nodes on occipital ring finer; only few nodes on cheek region. Doublure as wide as border on free cheek; narrowed on the genal spine, slightly broadened anteriorly. Front part occupied by rostral plate which lies exactly beneath the glabella. Doublure covered with striations similar to those seen on the border in lateral view and dorsal view. Doublure of occipital ring not preserved.

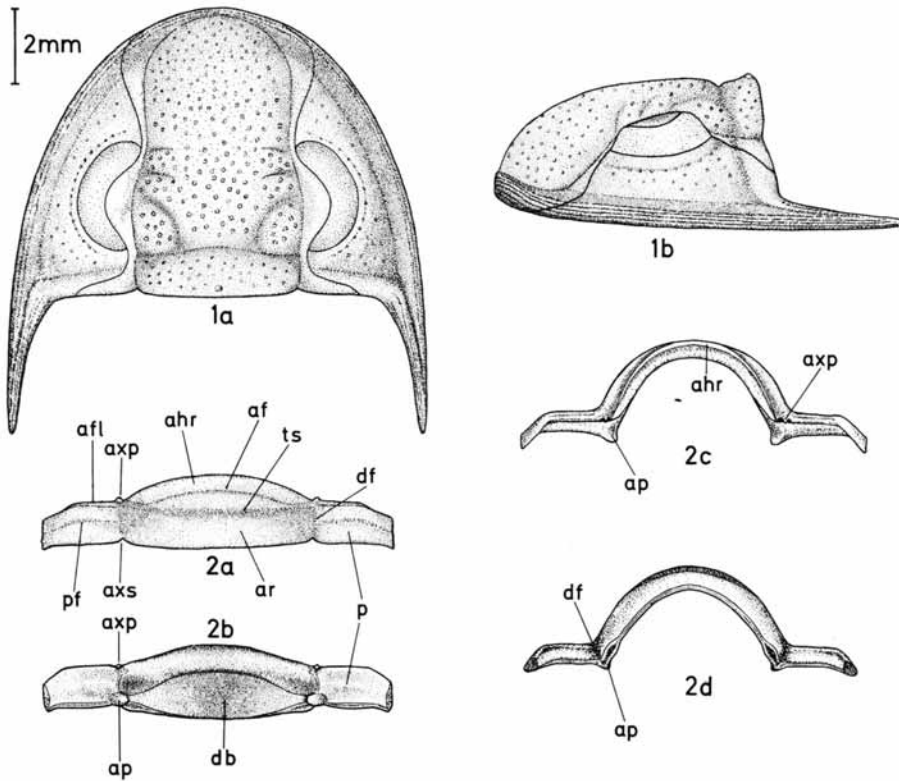
Measurements (in mm). Lengths: cephalon (without genal spine) 8.0, cephalon (with genal spines) 11.7, glabella 6.5, β - γ 2.75, palpebral lobe (γ - ϵ) 2.9, ϵ - ω 1.25, eye 3.3; breadths: cephalon (at the base of the genal spines) 11.2, cranium between β - β 5.1, cranium between δ - δ 5.8, glabella between δ - δ 4.6.

Thoracic segment (BU 21011). Dorsal view (text-fig. 2a). Axis broad (tr.) and narrow (sag.), subdivided into a short (sag.) anterior part that disappears laterally, and a longer (sag. and exsag.) posterior part, which is separated from anterior part by distinct furrow; anterior part situated somewhat lower than posterior portion. Articulating half-ring short, not as long (sag.) as anterior part of axis; axial furrow well pronounced, extending laterally to meet furrow that divides axis. Dorsal furrows slightly incised. Inner (adaxial) part of each pleuron situated horizontally, outer (abaxial) part bent downward (broken on BU 21011, but visible on BU 21012). Pleural furrow beginning at dorsal furrow, extending nearly to outer border. Anterior flange well pronounced, axial process small, fulcral process not differentiated; posterior flange not well separated from the pleura, axial socket and fulcral socket indistinct. Exact shape of lateral pleural border not preserved in any of specimens at hand. Ventral view (text-fig. 2b). Posterior doublure very prominent, covering nearly whole axis (sag.). Apodemata well evolved, node-like. No vertical rim between inner and outer part of pleura as seen in *Treatise*, figs. 49b, 50.

Anterior view (text-fig. 2c). Axis strongly arched; apodemata relatively short, situated beneath the dorsal furrow on each side. Inner part of pleuron horizontally disposed, outer part bent downward at an angle of about 45°. Axial process on each side visible as a little node. Posterior view (text-fig. 2d). Arching of axis as in anterior view. Posterior wall of the segment slightly grooved above the apodemata, grooves continuing on each side of posterior wall of pleuron, visible ventrally also (see text-fig. 2b). Dorsal furrows distinct, but nearly obsolete in anterior view. (As a whole the thoracic segments are similar to those of *Paladin* (*Paladin helmsensis* (Whittington 1954, pl. 3, figs. 7-16).) Number of thoracic segments in *L. matthewsi* unknown (only isolated segments are present), but presumably totalling nine as in nearly all Carboniferous Proetidae. Affiliation of the described thoracic segments to *L. matthewsi* not proven, but probable because of rarity of all other trilobite species in the Holwell fauna in comparison with *L. matthewsi*.

Pygidium (BU 21019). Side view. Rhachis nearly as high as pleural lobe, curving gently back to last ring, then falling down vertically to short, convex postaxial portion which is part of pygidial border. Rings prominent, strongly arched, with steep posterior slopes. Pleural ribs also prominent, well separated by pleural furrows. Anterior part more nearly horizontally disposed than behind rhachis. Posterior view. Rhachis well arched, curved semicircularly. Inner half of pleura directed horizontally, outer half steeply sloping downward. Anterior part of border sloping parallel to outer half of pleura.

Dorsal view (Pl. 64, figs. 3, 5-6). Outline slightly triangular in shape, somewhat broader than long. Rhachis long, nearly as broad as a pleural lobe, gently tapering posteriorly, with termination well rounded. 17-18 rings; rings 1-10 very prominent, last rings indistinct. Each ring divided (trans.) into a spinous central portion and on each side a smooth portion (which covers the region where the nearly invisible impressions of the pygidial muscles are situated). Central part ornamented with 5-7, slightly backwards directed, short spines, one of which covers sagittal line. Axial furrows directed straight (tr.) centrally, showing slight



TEXT-FIGS. 1-2. *Linguaphillipsia matthewsi* sp. nov. Viséan, Holwell, Somerset, England.

1. Cephalon, holotype, BU 21000 (see Pl. 64, fig. 1). *a*, Dorsal view; *b*, Lateral view.

2. Thoracic segment, BU 21011. *a*, Dorsal view; *b*, Ventral view; *c*, Anterior view; *d*, Posterior view.

Abbreviations. *afl* anterior flange; *ahr* articulating half-ring; *ap* apodeme; *ar* axial ring; *axp* axial process; *axs* axial socket; *db* doublure; *df* dorsal furrow; *af* axial furrow; *p* pleura; *pf* pleural furrow; *ts* transversal furrow, dividing axial ring in an anterior and a posterior portion.

backward curvature against dorsal furrow; anterior axial furrows well incised, posterior furrows only slightly incised. Dorsal furrows distinct. Pleural lobe with 10 ribs and place for one more. Ribs well separated by narrow, deeply incised pleural furrows. Rib furrows vestigial, visible as weak line on anterior ribs only: on first rib grooved against border, separating clearly anterior and posterior branch of rib. Anterior branch of ribs distinctly broader (exsag.) than posterior branch; ribs rounded in cross-section, ornamented with small node at half-length (tr.). Ribs terminating at well-incised border furrow which separates relatively narrow, convex curved border from remaining part of pleural regions. First rib furrow continuing on to border. Terminal part of border in contact with posterior slope of rhachis. Connecting half-ring and connecting half-ribs (sag., exsag.) narrow; connecting half-ribs marked by slight process which is directed anteriorly and is situated somewhat inward of rib nodes. Doublure (visible in cross-section on left pleura) as wide as border, pressed against it, ornamented with striations.

Measurements. See Table 1.

TABLE 1. Measurements (in mm) of three pygidia of *Linguaphillipsia matthewsi* sp. nov.

	Pygidium		Rhachis		Number of rings	Number of ribs
	Length	Breadth	Length	Breadth		
BU 21019	7.9	10.0	7.0	3.5	17	10 (+1)
BU 21020	5.75	6.75	5.2	2.6	16 (+1)	9 (+1)
BU 21021	9.3	11.3	8.5	4.0	18	12

Variations. Among the free cheeks significant variation is found only in the structure of the border region. In BU 21005 the border furrow is relatively shallow and the border itself only slightly arched (Pl. 64, fig. 4), but in BU 21007 and BU 21008 the border furrow is more deeply incised and the border well arched. These two latter free cheeks are both smaller than BU 21005 (approximately half as long as BU 21005), so that these differences of the border regions may be interpreted as having arisen during postlarval ontogeny.

Among the pygidia the number of rings and ribs differs only slightly (see Table 1). The rib furrows are somewhat better expressed in BU 21020 (Pl. 64, fig. 3) and BU 21021 (Pl. 64, fig. 5) than in BU 21019 (Pl. 64, fig. 6). In all other respects the available pygidia are very similar, accentuating the specific characteristics of *L. matthewsi*.

Discussion. Among the characteristic features of *L. matthewsi* the most important one is the way in which the glabella encroaches on the anterior cephalic border. In *L. terapaiensis* Stubblefield 1948, *L. paczoltovicensis* (Jarosz 1914) and related species the glabella is separated from the anterior border by a deeply incised, prominent border furrow; in *L. silesiaca* (Scupin 1900), which is closely related to *L. terapaiensis*, the glabella is lengthened anteriorly and presses against the anterior border, but does not encroach on it. In *L. longicornuta* (Leyh 1897) and its allies the anterior border is broad (sag.) and plane, not arched, and the border furrow is vestigial. In these species the glabella also terminates at the border, and does not encroach on it. Only in *L. ohmorensis* (Ohkubo 1951) from the lowermost Carboniferous of Japan does the glabella encroach on the posterior part of the border in the manner seen in *L. matthewsi*. As both these species are similar in most of their other features, it seems probable that *L. matthewsi* might have descended from the older Japanese species. The main differences between *L. matthewsi* and *L. ohmorensis* are found in the structure of the pygidia: in *L. ohmorensis* the pygidium is more elongate and its border is broader. The number of rings and ribs is similar in the two species (17–18 rings and 10–12 ribs in *L. matthewsi*, 17 rings and 11 ribs in *L. ohmorensis*). Other differences between the two species are of minor interest; they involve the more slender glabella, the rather lesser arching of the cephalic border, the smoother surface, lacking granulation, of *L. ohmorensis*. It is possible that some of these differences are simply due to post-mortem influences, because in *L. ohmorensis* it is the inner mould that is known and in *L. matthewsi* the outer.

The geographical distribution of *L. ohmorensis* and *L. matthewsi* is perplexing, the one being found in Japan, the other in England. But *Linguaphillipsia* was a genus typical of the Tethys region during the Lower Carboniferous and has been found in nearly all parts of the Eurasiatic Tethys; in Austria, Turkey, Central Asia, SE. Asia, Japan, and Australia. From this central pool it seems that species occasionally invaded the border regions of Tethys: Germany, Poland, the Moscow Basin, and the Urals. It may be merely an accident of preservation that one of the two related species is found in the eastern part of the Tethys region, in Japan, and the other

near its western end, in England. Probably species closely related to *L. ohmorensis* and *L. matthewsi* would have spread out through most parts of the Tethys, as was the case with the *L. terapaiensis*-group, whose distribution is known from Poland to SE. Asia.

Subfamily PHILLIPSINAE Oehlert 1886
Subgenus PHILLIPSIA (PHILLIPSIA) Portlock 1843

Type species. *Phillipsia kellyi* Portlock 1843.

Diagnosis. Osmólska 1970, p. 79, and G. and R. Hahn 1972, p. 391 ('Beziehungen').

Phillipsia (Phillipsia) holwellensis sp. nov.

Plate 64, figs. 8-9; text-fig. 3

Derivation of name. After Holwell Quarry, Mendip Hills, England.

Holotype. Pygidium BU 21023₁; text-fig. 3.

Type locality. Holwell Quarry, in the Mendip Hills, Somerset, England.

Type horizon. Clifton Down Limestone, Viséan.

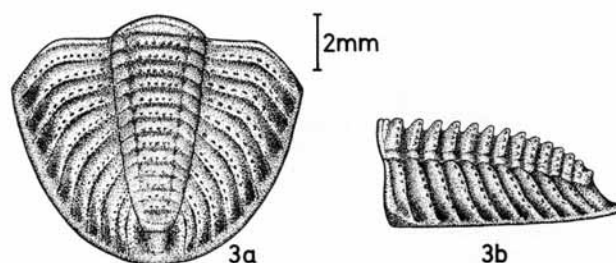
Distribution. Known only from the type locality and the type horizon.

Paratypes. 6 pygidia, partly broken, BU 21023₂₋₃, 21024-21027.

Diagnosis. A species of *Phillipsia (Phillipsia)* with the following characteristics: pygidium with 13-14 rings and 11-12 ribs. Posterior ribs sharply curving backwards. Posterior branches of the ribs suppressed, forming only the vertically directed posterior slope of each rib. Border very narrow, covered by the terminal portions of the ribs. End of rhachis peculiarly constructed (see below).

Description (holotype, BU 21023₁). Side view (text-fig. 3*b*). Rhachis not nearly as high as pleural lobes, curving down gently in its posterior half; postaxial portion inclined at about 45°. Rings prominent, rhachis furrows deeply incised. Pleural ribs also prominent, well separated by pleural furrows. Border horizontally disposed.

Posterior view. Rhachis well arched in a nearly semicircular curve. Dorsal furrows deeply incised. Pleural lobes transversely arranged where they first arise from dorsal furrow, then curving downwards very



TEXT-FIG. 3. *Phillipsia (Phillipsia) holwellensis* sp. nov. Viséan, Holwell, Somerset, England. Holotype pygidium, BU 21023₁. *a*, Dorsal view; *b*, Lateral view.

steeply in their outer parts but returning to horizontal disposition at border; anterior ribs sloping nearly vertically.

Dorsal view (text-fig. 3a). Outline oval, nearly as broad as long. Rhachis long, relatively narrow, clearly divided laterally into well-arched central portion and less well-arched lateral portions which cover region of impressions of pygidial muscles. Number of rings 13; rings prominent, separated by deeply incised, relatively broad (sag.) rhachis furrows; posterior rings also well differentiated. Terminal part of rhachis blunt, peculiar in its construction: behind the last ring there follows a very broad and shallow furrow that changes into a slight elevated rim at the very end of the rhachis. Postaxial portion separated from the rhachis by a distinct step. Dorsal furrows well incised. Pleural lobes sub-divided by 12 ribs on each side. Anterior ribs nearly transverse; in their direction posterior ribs directed clearly backwards. Rib furrows suppressed, visible only on the anterior ribs, rather more clearly seen on BU 21024 and BU 21025 (Pl. 64, figs. 8-9). Posterior branches of ribs confined to the vertically orientated posterior slope of each rib. Pleural furrows deeply incised, broad (exsag.). Ribs continuing on very narrow border, which is distinct from rest of pleural lobes only by its curving back into a horizontal position. Connecting half-ring (broken medially in holotype) and connecting half-ribs narrow (sag., exsag.), projecting only slightly. Surface of holotype nearly smooth, but on BU 21024 and BU 21025 with a row of very small nodules on each ring and rib (Pl. 64, figs. 8-9). Doublure (visible on BU 21023₂) narrow, with 7-8 soft striations.

Measurements (in mm). Length of pygidium 9.7, length of rhachis 8.5, breadth of pygidium 10.0, breadth of rhachis 4.0.

Variations. See under *Phillipsia* (*Phillipsia*) sp., below.

TABLE 2. Comparison of pygidia of best-known species of *Phillipsia* (*Phillipsia*) Portlock 1843

	Rings	Ribs	Post. branches of ribs	Extension of ribs
<i>Ph. (Ph.) gemmulifera</i> (Phillips 1836)	17	13	Not suppressed	Not on border
<i>Ph. (Ph.) ornata</i> Portlock 1843	19-21	16-18	"	On border
<i>Ph. (Ph.) truncatula</i> (Phillips 1836)	18	16	"	Not on border
<i>Ph. (Ph.) magnoculata</i> Osmólska 1970	16	13	"	"
<i>Ph. (Ph.) kellyi</i> Portlock 1843	17	13	Suppressed	"
<i>Ph. (Ph.) moelleri</i> Osmólska 1970	20	15	"	"
<i>Ph. (Ph.) conserrata</i> Weber 1937	16	10	"	On border
<i>Ph. (Ph.) holwellensis</i> sp. nov.	14	11-12	"	"

Discussion. As shown by Table 2, *Ph. (Ph.) holwellensis* has a peculiar combination of morphological features such as is not seen in any other species of *Phillipsia* (*Phillipsia*). These features are: 1, the low number of rings and ribs; 2, the fully posteriorly directed posterior ribs; 3, the suppression of the posterior branches of the ribs; 4, the prolongation of the ribs on the border; and 5, the very weak sculpture. A similar number of rings and ribs is seen only in certain Russian and Australian species, e.g. *Ph. (Ph.) conserrata* Weber 1937 (16 rings, 10 ribs), *Ph. (?) (Ph.?) dungsensis* Mitchell 1918 (14 rings, 12 ribs), and *Ph. (Ph.?) rockhamptonensis* Mitchell 1918 (12 rings, 8 ribs). The latter two Australian species differ markedly from *Ph. (Ph.) holwellensis* in that the posterior branches of their ribs are not suppressed and by the lesser backward curvature of their posterior ribs (as far as can be judged from the photographs given by Mitchell). Rather more closely similar to *Ph. (Ph.) holwellensis* is *Ph. (Ph.) conserrata* from the ?Viséan of the southern Urals, which nevertheless differs in two characteristics: there are more rings, but fewer ribs, and the surface is ornamented by a coarse granulation (see Osmólska 1970 and G. and R. Hahn 1972).

Ph. (Ph.) holwellensis differs from all described species of *Phillipsia* (*Phillipsia*) so far known in western Europe not only by its lesser number of rings and ribs and its soft ornamentation, but also in its combination of suppressions of the posterior branches of the ribs and prolongation of the ribs on to the border. Suppression of the posterior branches of the ribs occurs in *Ph. (Ph.) kellyi* Portlock 1843 and *Ph. (Ph.) moelleri* Osmólska 1970, but in neither of these species do the ribs invade the border. On the other hand, *Ph. (Ph.) ornata* Portlock 1843, the ribs continue on to the border, but the posterior branches of the ribs are not suppressed. Finally, in *Ph. (Ph.) gemmulifera* (Phillips 1836), *Ph. (Ph.) truncatula* (Phillips 1836), and *Ph. (Ph.) magnoculata* Osmólska 1970 the posterior branches of the ribs are not suppressed, nor do the ribs invade the border. In both these respects they differ from *Ph. (Ph.) holwellensis*.

Ph. (Ph.) holwellensis appears as an isolated occurrence in the Viséan of England, and is most nearly related to *Ph. (Ph.) conserrata* from the southern Urals.

Phillipsia (*Phillipsia*) cf. *holwellensis* sp. nov.

Plate 64, fig. 10

Among the collection from Holwell there is one pygidium (BU 21028) which is similar to *Ph. (Ph.) holwellensis* in many features, especially in its low number of rings (13) and ribs (11) and in the peculiar structure of the terminal part of its rhachis, but which differs in three respects: its outline is more rounded, its last ribs have a lesser backward inclination, and (the most important) its border is somewhat elevated and is not invaded by the ribs (see Pl. 64, figs. 8-10).

Although this pygidium looks rather different from that of *Ph. (Ph.) holwellensis*, it is probable that it belongs to this species. The elevation of the border may have been due to post-mortem factors; it has developed to a relatively high degree on the right pleural lobe but is not seen in the anterior part of the left pleural lobe. The other differences may be interpreted as due to biological variation.

Subfamily CUMMINGELLINAE G. and R. Hahn 1967
Genus CUMMINGELLA Reed 1942

Type species. Phillipsia jonesii Portlock 1843.

Diagnosis. Treatise, p. 401, and G. and R. Hahn 1972, pp. 341-342 ('Beziehungen').

Cummingella jonesi jonesi (Portlock 1843)

Plate 64, fig. 7

*1843 *Phillipsia jonesii* Portlock, 308, pl. 11, figs. 3a-d.

1970 *Cummingella jonesi jonesi*, Osmólska, 55-56, pl. 5, figs. 3-4, text-figs. 5A, G, P, S.

1972 *Cummingella jonesi jonesi*, G. and R. Hahn, 348-351, 351 (with full synonymy).

Type, type locality, type horizon, distribution. See G. and R. Hahn 1972, pp. 350, 351.

Remarks. Among the Holwell trilobites are two specimens which can be referred to *Cummingella jonesi jonesi*. One is a pygidium (BU 21029, Pl. 64, fig. 7), originally complete, now broken along the fracture visible on the rhachis in the photograph, the other is the posterior part of a left free cheek, BU 21030.

Specimen BU 21029 compares very well with the pygidium of the lectotype figured by Stubblefield (1952, pl. 1, figs. 1a-c) in the shape of the pygidium, the shape of the rhachis, the number of rings (12+) and ribs (9), the breadth of the border and its arching. As in *C. jonesi jonesi* only the four anterior rib furrows continue distinctly on the border, whereas in *C. jonesi laticaudata* (Woodward 1884) (see Osmólska 1970, pl. 5, figs. 8-9) and in *C. jonesi orleiensis* Osmólska 1970 (see Osmólska 1970, pl. 5, fig. 1) the posterior rib furrows also encroach on the border. This feature determines the subspecific identity of the pygidium found at Holwell.

BU 21030 shows the posterior part of a free cheek, with an elevated lateral and posterior border, both of which are separated from the rest of the cheek by well-incised furrows. A genal spine is not present. The character of the free cheek is therefore as is found in *C. jonesi jonesi*.

These specimens of *C. jonesi jonesi*, although they add no new morphological information, do nevertheless contribute something to our stratigraphical knowledge of the subspecies. In all earlier recorded occurrences (including the type specimens) the exact stratigraphical location has been unclear. Stubblefield (1952) cites only 'Carboniferous Limestone', and Osmólska (1970, p. 55) states '(?Middle) Viséan' without more precise information. The first indication of a more exact stratigraphical attribution was given in G. and R. Hahn (1968), where specimens from Heiligenhaus (Germany) were reported to be confined to cuII δ , Lower Viséan. The Holwell specimens seem to occur at a comparable stratigraphical horizon. It is possible that *C. jonesi jonesi* was already extant in cuII β - γ (see the discussion in G. and R. Hahn 1968, pp. 441-442), but this is not yet confirmed, neither morphologically nor stratigraphically. Occurrences younger than the cuII/cuIII boundary and genuinely referring to *C. jonesi jonesi* are not known to us.

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