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IV.—Notes on the Permian system of the counties of Durham and Northumberland

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Comatula Woodwardii. Pl. VII. fig. 1.

Arms long and tapering, each ray bearing from 60 to 70 pinnæ on each side. The two pinnæ nearest the disk have each 27 joints; the third and those above it, 18. Each pinna is separated by two joints. The larger filiform processes are composed of 45 joints, gradually tapering, terminated by a claw which is larger than the joint next to it. Two specimens from the Sound of Skye, 25 to 40 fathoms, gravel and mud. I have dedicated this species to my friend S. P. Woodward, Esq.

Amphidotus gibbosus, Agass. Pl. VII. fig. 2 a, b, c.

Amphidotus gibbosus, Agass., Catalogue Raisonné des Echinides, in the Annales des Sciences Naturelles, vol. viii. p. 11.

Test cordate, as broad as long, thickly clothed with curved spines pointing towards the vent. The spines of the post-oral space have slightly flattened tips. The anterior and posterior lateral ambulacra meet at the lateral angles of the dorsal fasciole. In each of the anterior halves of the anterior lateral ambulacra there are eight very distinct pairs of pores lodged in a shallow groove; in the posterior halves of the same ambulacra there are fourteen pairs in a somewhat deeper groove. The number of pores in each row of the posterior ambulacra is equal, eleven in each series. The odd ambulacrum is covered with fine granules; the pores are not distinct, and there is no anterior groove as in *A. cordatus*. The anus is depressed, and the subanal impression quadrate, enclosing two pores on each side. The mouth is large, and placed one-third of the length of the test from the margin. The single specimen above described was dredged in 25 fathoms on the south side of Bressa Island, Zetland, on a coarse sandy bottom. It is with some hesitation that we refer this species to the *A. gibbosus* of Agass., the original description being very short and imperfect.

EXPLANATION OF PLATE VII.

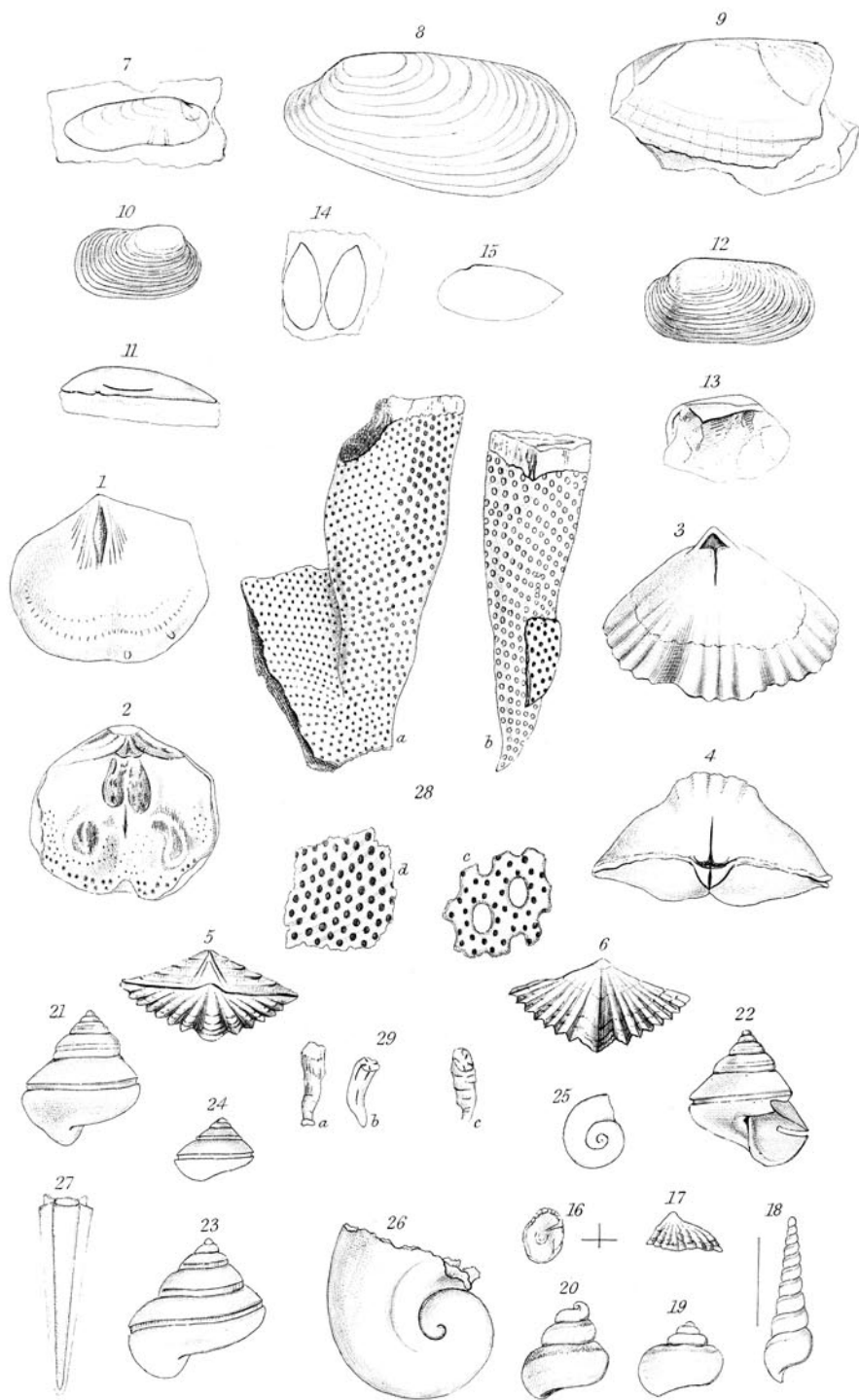
Fig. 1. *Comatula Woodwardii*, nobis, nat. size.

Fig. 2 a, b, c. *Amphidotus gibbosus*, Agass., nat. size.

IV.—Notes on the Permian System of the Counties of Durham and Northumberland. By RICHARD HOWSE, South Shields.

[With a Plate.]

SINCE I had the pleasure in 1848 of drawing up a Catalogue of the fossils of the Permian System, collected by myself in the counties of Durham and Northumberland, at the request and
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for the use of the Committee of the Tyneside Naturalists' Field Club, I have on every convenient opportunity been engaged in prosecuting the same studies both in the cabinet and in the field. The works that have appeared since, by Dr. Geinitz and Mr. King, have also been subjected to a very careful examination. By the assistance of fresh specimens and a careful examination of old and new sections, I am enabled to correct many important inaccuracies which the latter author has made, and also to rectify some of my own earlier statements.

That the distribution of the fossils of this system may be better understood, I have drawn up the following account of the stratigraphical order of these rocks, from notes and sections collected during the last fifteen years. All the most important sections were revisited last autumn, to prevent as far as possible any mistake.

PERMIAN SYSTEM.

1. Lower Bunter ?

A deposit of reddish sandstone appears in two or three places in the south-easternmost part of the county of Durham. It is however generally so completely covered up with alluvium as to admit of very imperfect examination, and its fossils are entirely unknown.

Loc. Seaton-Carew, Preston-on-Tees, Coatham-Stob.

2. Magnesian Limestone.

UPPER.

1. UPPER YELLOW LIMESTONE.—A deposit of yellow, earthy, friable, thin-bedded limestone, with occasional beds of fine-grained and of oolitic structure.

Probable thickness 100 feet.

CHARACTERISTIC FOSSILS.—*Myalina squamosa*, Sow. ; *Myoconcha costata*, Brown ; *Axinus obscurus*, Sow. ; *Littorina helicina*, Schloth.

Loc. Roker, Sunderland, Hartlepool.

2. CONGLOBATED LIMESTONE.—This division consists of beds chiefly of a spheroidal, botryoidal, finely-laminated, close-grained and highly crystalline structure, interstratified with close-bedded, compact layers, and others which are earthy, friable, and pulverulent. The lower beds are occasionally much contorted and broken up by intrusive brecciated masses.

Thickness probably more than 150 feet.

CHAR. FOSS.—*Myalina squamosa*, Sow. ; *Myoconcha costata* ; *Axinus obscurus*, Sow. ; *Leda spehuncaria*, Geinitz ; *Littorina*

helicina, Schloth. Numerous *Entomostraca* and *Foraminifera*. Also the remains of *Palaeonisci*, &c.

Loc. Coast of Durham from Marsden Bay to Roker, between Hendon and Ryhope, and between Seaham and Black Halls; Cleadon Hills, Fulwell Hill, Building Hill, &c.

MIDDLE.

3. CONCRETIONARY AND SHELL LIMESTONE. — An amorphous irregular deposit of highly crystalline or saccharine limestone, occasionally full of small, irregular cavities, partially or entirely filled with a fine earthy yellowish powdery substance; other parts present the appearance of being formed of shapeless fragments of compact limestone imbedded in a completely investing matrix, without taking the form of a true breccia. Occasionally, however, large angular masses of finely laminated limestone are imbedded in it, especially towards its highest portion, where it also gradually becomes more earthy, and in some localities regularly bedded.

Its thickness is probably more than 150 feet.

Without fossils.

Loc. Tynemouth, North Point to Marsden Bay; coast between Ryhope, Seaham, and Castle Eden-dene; banks of the Wear above Sunderland Bridge; Tunstall Hope.

The Shell Limestone forming the westernmost or baseting portion of the above deposit is an irregular mass of highly crystalline limestone, in some parts exceedingly hard and fine-grained, and in others friable, earthy and rubbly, consisting of broken pieces of coral and shells. It contains an assemblage of the most characteristic fossils of the system. When seen in section it generally rests on the compact limestone, but at Clack's Heugh it rests also on a bed of incoherent sand.

The thickness, owing perhaps to denudation, is not more than 50 feet.

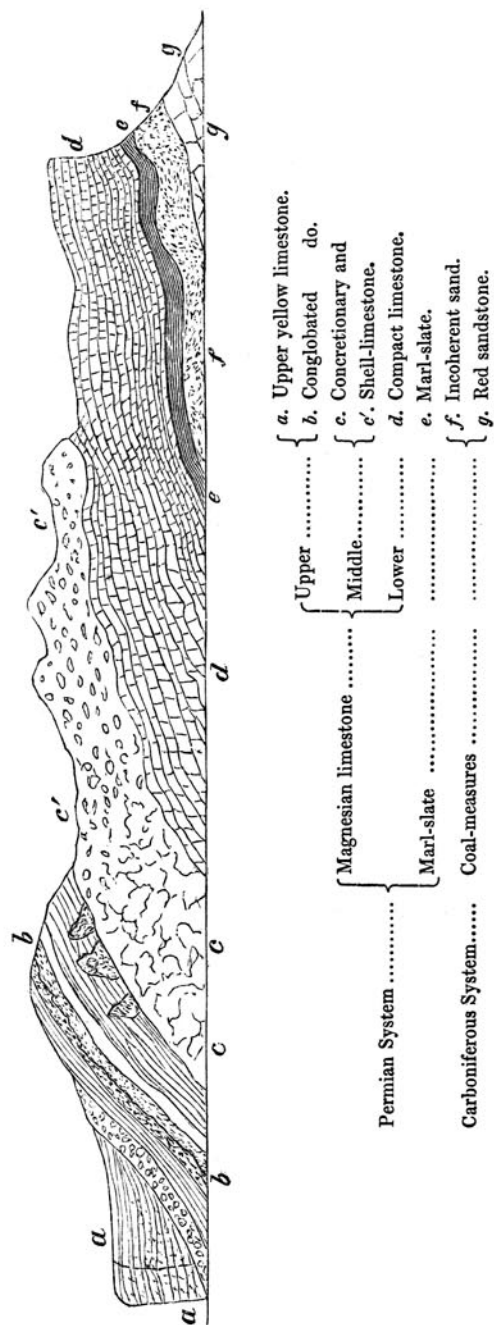
CHAR. FOSS.—*Terebratula elongata*, Schloth.; *Camarophoria Schlotheimi*, v. Buch; *Spirifer undulatus*, Sow.; *Strophalosia Goldfussi*, Müntst.; *Productus horridus*, Sow.; *Fenestella retiformis*, Schloth.; *F. virgulacea*, Phill., &c. &c.

Loc. West Boldon, Hylton Castle, Southwick Red House, Clack's Heugh, all on the escarpment. High Barns, Humbleton Hill, Elstobs, Tunstall Hill, Ryhope Field House, Dalton-le-dale, Castle Eden-dene. These places are situated on the middle portions of the Magnesian Limestone.

LOWER.

4. COMPACT LIMESTONE AND CONGLOMERATE.—In most places on the escarpment the compact limestone forms a very thick

Ideal Section across the Magnesian Limestone Terrace.



deposit of thin-bedded, compact, bluish, grey or mottled limestone, becoming occasionally brown, earthy, cellular, and with thicker beds towards the top.

It attains a thickness probably of 150 to 200 feet.

CHAR. FOSS.—Same as in shell-limestone, but not so abundant.

Loc. Whitley, Cullercoats, Tynemouth, outliers; from North Point to Man Haven, surmounted by concretionary limestone; Westoe, West Boldon, Hylton Castle, Clack's Heugh, Pallion, Mill Field, Humbleton, Tunstall Hope, Painshaw Hill, and most other parts of the escarpment to Pierce Bridge.

The Conglomerate is a very local deposit of rounded fragments of compact limestone imbedded in a limestone matrix. It is of inconsiderable thickness, and passes into the associated compact limestone.

CHAR. FOSS.—Same as in compact limestone.

Loc. Tynemouth; Black Halls? Houghton-le-side?

3. Marl Slate.

The Marl-slate is a very thin deposit, seldom exceeding a yard in thickness, of a dark grey, or yellowish, finely laminated marl.

CHAR. FOSS.—*Palæonisci*, *Platysomi*, and other fishes; *Discina Konincki*, Gein.; *Lingula Credneri*, Gein.; *Caulerpites selaginoides*, Schloth., and other fucoids.

Loc. Cullercoats, Tynemouth, Westoe, West Boldon, Clack's Heugh, and most other places on the escarpment.

GENERAL REMARKS.

The foregoing divisions include all the beds which can be with safety referred to, and satisfactorily determined to belong to the Permian System as developed in the counties of Durham and Northumberland. But it has hitherto been the custom of English geologists to consider an extensive bed of incoherent yellow sand and red sandstone lying immediately beneath these, as members of the same system, and to separate them by a distinctive name from the subjacent coal-measures, with which they are perfectly conformable, and, so far as the red sandstone is concerned, identical in fossil contents. At Cullercoats and Tynemouth the red sandstone is so evidently conformable, and passes so gradually into the shales and sandstones of the true coal-measures, that it is impossible to separate them, or point out a line of separation. The same arrangement also is seen on the banks of the Wear, near Clack's Heugh, where both these beds are seen dipping at the same angle as the coal-measures.

The incoherent yellow sand is present at almost all places along the escarpment of the limestone, but it varies considerably in thickness. It is very coarse and gritty, with strong lines of false bedding; and from its variable thickness within short distances, the superior magnesian limestone must be unconformable to it.

The Red Sandstone, usually pointed out as the equivalent of the *Roth-liegende*, contains at Tynemouth and other localities an assemblage of genuine coal-measure fossils. During the last summer we obtained from the cuttings made for the new pier at Tynemouth the following species: viz. *Pinites Brandlingi*, *Trigonocarpon Nöggerathi*, *Sigillaria reniformis*, *Lepidodendron*, sp. indet., *Calamites approximatus*, *Calamites inæqualis*?; and in the shale immediately connected with the sandstone, *Neuropteris gigantea*, *Sphenopteris latifolia*, *Cyclopteris dilatata*, &c. The spine of *Gyracanthus formosus* has been found in the same bed near South Shields. In consequence of the presence of so many genuine coal-plants in this bed, its conformity to the coal-measures, and the apparent want of conformity between the incoherent sand and the superior limestone, we propose that these beds may for the future be considered true coal-measures, and the uppermost members of the Carboniferous System.

In the above divisions, the names given originally by Prof. Sedgwick have been adopted as far as possible. The terms *Pseudo-brecciated*, *Brecciated*, and *Crystalline*, are not admissible as divisional names. The former is the Concretionary limestone (Sedgw.), which is a more correct epithet than the proposed new name. The Breccia is too subordinate in the series to require a particular name, and the limestones of this series are all too crystalline to admit of this word as a distinctive term.

The following Table will give a pretty correct idea of the distribution of the Molluscan Fauna of the Permian System. The Brachiopoda are limited to the lower portions of the series,—to the marl-slate, compact limestone, and shell-limestone. There is no authenticated instance of the occurrence of a Brachiopod in the breccia or above it. The greatest number of Gasteropods are found in the middle division, the shell-limestone. Four species of Conchifera appear to be common to the whole limestone series: viz. *Myoconcha costata*, Brown; *Axinus obscurus*, Sow.; *Myalina squamosa*, Sow.; and *Leda Vinti*, King.

The works principally referred to in the following Table were published at the time mentioned below: viz.

‘Die Versteinerungen,’ April 1848.

‘Trans. Tyneside N. F. C.’ Aug. 10th, 1848.

‘A Cat. of Org. Rem.’ Aug. 19th, 1848.

‘Mon. Perm. Foss.’ 1850.

Synoptical Table of the MOLLUSCA of the Permian System of Durham and Northumberland.

No. of Species.	Genera and Species.	Authors.	References.	Synonyms.	Localities.	Magnesian Limestone.				
						Marl-slate.	Compact.	Conglomerate.	Shell-limestone.	Concretionary.
									Concreted.	Upper yellow.
										Lower Bunter.
BRACHIOPODA.										
1.	<i>Lingula Credneri</i>	Geinitz	Versteinerungen, p. 11. tab. 4. f. 23, 24.	<i>L. mytiloides</i> ? Trans. T. N. F. C. vol. i. p. 250.	Thrislington Gap, Ferry Hill.	*	*			
2.	<i>Discina Konincki</i>	Geinitz	<i>O. Konincki</i> , Grun. d. Verst. p. 495; Verst. tab. 4. f. 25, 26.	<i>Orbicula</i> , Trans. T. N. F. C. vol. i. p. 251. <i>Discina speluncaria</i> , Mon. pl. 6. figs. 28, 29.	Thrislington Gap, Gar-mundsway, Tunstall Hill, Humbleton Hill.	*	*			
3.	<i>Productus horridus</i>	Sow.	Min. Conch. tab. 319. f. 1.	<i>Orthothrix excavatus</i> , Verst. tab. 6. f. 21.	North Point near Shields, Westoe, Hylton Castle, &c. &c.	*	*			
4.	— <i>latirostratus</i>	Howse	Trans. T. N. F. C. vol. i. pp. 256-7; Ann. Nat. Hist. 2nd ser. vol. xix. Pl. IV. figs. 1, 2.	<i>P. umbonillatus</i> , King, Cat. p. 8; Mon. pl. 11. fig. 14-16; Schaubroth, Ein Beitrag u. s. w. tab. 1. f. 8-10.	Tunstall Hill, Dalton-le-dale, Ryhope Field House.		*			
5.	<i>Strophalosia Goldfussi</i> Münst.		Pl. 4. f. 3 a, b; Davidson, Mon. Brit. Perm. Brach. pl. 3. figs. 1-23. <i>Orthothrix Goldfussi</i> , Verst. tab. 5. f. 27-30, 32, 34. <i>Stroph. id.</i> , Mon. pl. 12. f. 1-12.	Trans. T. N. F. C. vol. i. p. 257. <i>Orthothrix excavatus</i> , Gein. Verst. tab. 5. f. 35-40, tab. 6. f. 20, 23. <i>Stroph. excavata</i> , Mon. pl. 12. f. 13-17.	Clack's Heugh, Humbleton Hill, Tunstall Hill, Ryhope Field House, Dalton-le-dale, Garinundsway, &c.	*	*			
6.	— <i>Canovini</i>	De Vern.	Geol. Russ. vol. ii. pl. 16. f. 8, pl. 18. f. 7; Davidson, Mon. Brit. Perm. Brach. pl. 3. f. 24-41.	<i>O. Goldfussi</i> , Verst. tab. 5. figs. 31, 33 a, b, c. <i>Prod. Canovini</i> , Verst. tab. 6. figs. 16-19. <i>Strophalosia Morrisiana</i> , King, Cat. p. 9; Mon. pl. 12. f. 18-25, 29-32. <i>O. lamellosus</i> , Geinitz, Verst. tab. 5. f. 16-26.	Westoe, Clack's Heugh, Humbleton Hill, Tunstall Hill, Ryhope Field House, Dalton-le-dale, &c.	*	*			

No. of Species.	Genera and Species.	Authors.	References.	Synonyms.	Localities.	Magnesian Limestone.					Lower Bunter.	
						Lower.		Middle.		Upper.	Upper yellow.	
						Compact.	Conglomerate.	Shell-limestone.	Concretionary.	Conglobated.		
7.	BRACHIOPODA (cont.). <i>Orthisina pelargonata</i>	Schloth.	<i>Terebratulites id.</i> , Beitr. z. Naturg. d. Verst. p. 28, tab. 8, f. 21-24.		Humbleton Hill, Tunstall Hill, Silksworth, Ryhope Field House, Dalton-le-dale.	...	...	*	...	...	...	...
8.	<i>Camarophoria Schlot-heimi</i>	v. Buch	über Terebrateln. pl. 2. f. 32	<i>Terebratula superstes</i> , Gein. Verst. tab. 4. f. 51, 52.	Tynemouth, Hylton Castle, Humbleton, Tunstall, Silksworth, Ryhope, Dalton-le-dale.	...	...	*	...	...	...	...
9.	— <i>globulina</i>	Phil.	Ency. Metrop. vol. iv. pl. 3. f. 3	<i>Ter. corymbosa</i> (errat.), Trans. T. N. F. C. vol. i. p. 253. <i>T. Schlotheimi</i> , Schaur. Beitr. pl. 1. f. 3 a, b.	Tynemouth, Hylton Castle, Dalton-le-dale, &c.	...	...	*	...	...	...	...
10.	— <i>Humbletonensis</i>	Howse	<i>Terebratula id.</i> , Trans. T. N. F. C. vol. i. p. 252; Ann. N. H. ser. 2. vol. xix. Pl. IV. f. 3, 4.	<i>C. multiplicata</i> , King, Cat. p. 7; Mon. pl. 7. f. 26-32, pl. 8. f. 1, 2.	Tynemouth, Humbleton.	...	...	*	...	...	...	...
11.	<i>Spirigera pectinifera</i>	Sow.	<i>Atrypa id.</i> , Min. Conch. vii. pl. 616.		Tynemouth, Hylton Castle, Humbleton Hill, Tunstall Hill.	...	...	*	...	...	...	...
12.	<i>Martinia Clannyana</i>	King	Cat. p. 8; Mon. pl. 10. f. 11, 12, 13.	<i>M. Winchiana</i> , King, Mon. pl. 10. f. 14, 15, 16, 17.	Whitley, Pallion near Sunderland, Ryhope Field House, Tunstall, Humbleton, Tunstall, Ryhope Field House.	...	...	*	...	...	...	...
13.	<i>Spiriferina cristata</i>	Schloth.	<i>Terebratulites id.</i> , Beitr. z. Naturg. d. Verst. p. 28, tab. 1. f. 3; Ann. Nat. Hist. ser. 2. vol. xix. Pl. IV. f. 5, 6.			...	...	*	...	...	...	...
14.	— <i>multiplicata</i>	Sow.	Geol. Tr. 2nd ser. iii. p. 119	<i>Trig. Jonesiana</i> , King, Mon. pl. 8. f. 19.	Humbleton, Tunstall, Silksworth, Ryhope, Dalton-le-dale.	...	...	*	...	...	...	...
15.	<i>Spirifer undulatus</i>	Sow.	Min. Conch. tab. 562. f. 1	<i>Trig. alata</i> , King, Mon. pl. 9. f. 4-12. <i>Trig. Permiana</i> , King, Mon. pl. 9. f. 18-24.	Tynemouth, Humbleton, Tunstall, Middle-ridge.	...	...	*	...	...	...	...

16.	<i>Terebratulæ elongata</i> ... CONCHIFERA.	Schloth.	Beitr. z. Naturg. d. Verst. p. 27. f. 7-14.	<i>Epiphyris sufflata</i> , King, Mon. pl. 7. f. 1-9.	Tynemouth, Castle, Clack's Heugh, Humbleton, &c. &c.	...	...	...	...	...	...
17.	<i>Pecten pusillus</i>	Schloth.	Beitr. z. Naturg. d. Verst. p. 31. tab. 6. f. 6.	...	Tunstall, Humbleton, Ryhope, Dalton.	...	...	...	...	...	...
17a	<i>Lima Permiana</i>	King	Mon. pl. 13. f. 4.	...	Tunstall, Ryhope, Humbleton.	...	...	...	...	...	...
18.	<i>Monotis speluncaria</i> ...	Schloth.	<i>Gryphites id.</i> , Beitr. z. Naturg. d. Verst. p. 30. tab. 5. f. 1.	<i>Monotis gryphæoides</i> , Trans. T. N. F. C. vol. i. p. 249. <i>M. radiatus</i> , Phill., King, Mon. pl. 13. f. 22, 23. <i>M. Garforthensis</i> , King, Mon. pl. 13. f. 24. <i>M. —</i> ? Mon. pl. 13. f. 25. <i>Arvic. Kazanensis</i> , Gein. Verst. tab. 4. f. 20, 21.	Clack's Heugh, Tynemouth, Humbleton, Tunstall, Ryhope, Dalton-le-dale, &c.	...	...	...	...	...	...
19.	<i>Gervillia antiqua</i>	Münst.	Goldf. Petref. pl. 116. f. 7.	<i>Arvic. inflata</i> , Trans. T. N. F. C. vol. i. p. 250. <i>Bakevella tumida</i> , King, Cat. p. 10; Mon. pl. 14. figs. 35, 36, 37.	Whitley, Tynemouth, Clack's Heugh, Hylton Castle, Humbleton, Tunstall, Ryhope, Dalton-le-dale, &c.	...	...	...	...	...	...
20.	— keratophaga	Schloth.	Beitr. z. Naturg. d. Verst. p. 30. tab. 5. f. 2.	<i>Bakevella Sedgwickiana</i> , King, Mon. pl. 14. f. 38, 39, 40. <i>B. bicarinata</i> , King, Mon. pl. 14. f. 41, 42. <i>Mgt. acuminatus</i> , Trans. T. N. F. C. vol. i. p. 248. <i>Mgt. Hausmanni</i> , Gein. Verst. tab. 4. figs. 9, 10, 11, 12, 13, 14, 15. <i>Mgt. squamosus</i> , Trans. T. N. F. C. vol. i. p. 248. <i>Mgt. septifer</i> , King, Mon. pl. 14. f. 8-13.	Humbleton, Tunstall.	...	...	...	...	...	...
21.	<i>Myalina squamosa</i>	Sow	Geol. Trans. 2nd ser. iii. p. 120. no. 11. <i>Mytilus acuminatus</i> , Sow. Geol. Trans. 2nd ser. iii. p. 119. no. 10.	...	Hylton Castle, Clack's Heugh, Humbleton, Tunstall, Silkworth, Ryhope, Dalton, Marsden, Cleadon Hills, Byer's Quarry, Roker, &c. &c.	...	...	...	...	...	...
22.	<i>Macrodon striata</i>	Schloth.	<i>Mytilites striatus</i> , Beitr. z. Naturg. d. Verst. p. 31. tab. 6. f. 8.	<i>Arca tumida</i> , Trans. T. N. F. C. vol. i. p. 247; Verst. tab. 4. f. 6 a, b; Mon. tab. 15. f. 1-5. <i>A. Loftusiana</i> , Trans. T. N. F. C. p. 246. <i>A. Kingiana</i> , Trans. T. N. F. C. p. 247. <i>Byssonarca Kingiana</i> , Cat. p. 11; Mon. pl. 15. f. 10, 11, 12. <i>Arca Kingiana</i> , Verst. p. 9. pl. 4. f. 8 a, b, c.	Hylton Castle, Humbleton, Tunstall, Silkworth, Ryhope Field House, Dalton-le-dale.	...	...	...	...	...	...
23.	<i>Leda speluncaria</i>	Geinitz	<i>Nacula id.</i> , Verst. p. 9. tab. 4. f. 6 a, b.	<i>Leda Finti</i> , King, Cat. p. 11; Mon. pl. xv. f. 21, 22. <i>N. Tateiana</i> , Mon. p. 175?	Whitley, Humbleton, Byer's Quarry, Tunstall.	...	...	...	...	...	...

No. of Species.	Genera and Species.	Authors.	References.	Synonyms.	Localities.	Marl-slate.				Magnesian Limestone.				
						Compact.	Conglomerate.	Shell-limestone.	Concretionary.	Conglobated.	Upper yellow.	Lower. Middle Upper.	Lower Bunter.	
24.	CONCHIFERA (cont.). <i>Solemya normalis</i>	Howse	Trans. T. N. F. C. p. 244; Annals, ser. 2, vol. 19. Pl. IV. f. 7.		Humbleton, Tunstall ...			*						
25.	— abnormis	Howse	Trans. T. N. F. C. p. 244; Ann. Nat. Hist. ser. 2, vol. 19. Pl. IV. f. 8, 9.	<i>Panopea lunulata</i> , Gein. Verst. pl. 3. f. 21. <i>S. biarmica</i> , Gein. Verst. pl. 3. f. 34, non Vern.	Whitley, Humbleton, Tunstall, Silksworth.	*		*						
26.	<i>Axius obscurus</i>	Sow. ...	Min. Conch. vol. iv. pl. 314. ...	<i>Schizodus Schlotheimi</i> , Gein. Verst. tab. 3. f. 23-33; King, Mon. pl. 15. f. 31, 32; <i>Schizodus truncatus</i> , King, Cat. p. 11; Mon. pl. 15. f. 25-28. <i>S. rotundatus</i> , Brown, King's Mon. pl. 15. f. 30.	Marsden, Cleadon Hills, Roker, Humbleton, Tunstall, Silksworth, Ryhope, Dalton-le-dale, Cornforth.	*		*					*	
27.	<i>Astarte Vallisneriana</i> ..	King ...	<i>Astarte</i> ? Geol. Trans. 2nd ser. iii. p. 119. no. 9; Mon. tab. 16. f. 1.		Whitley	*								
28.	<i>Myoconcha costata</i> ...	Brown	<i>Arca costata</i> , Manch. Geol. Tr. pl. 6. f. 34, 35.	<i>Cardita Murchisoni</i> , Gein. Verst. pl. 6. f. 1-5.	Whitley, Hylton Castle, Clack's Heugh, Humbleton, Tunstall, Silksworth, Ryhope, &c.	*		*		*				*
29.	— modioliformis ...	King ...	<i>Cardiomorpha modioliformis</i> , Mon. pl. 14. f. 18-23.		Tunstall, Humbleton, Silksworth, Ryhope.			*						
30.	<i>Myacites elegans</i>	King ...	<i>Allorisma elegans</i> , Cat. p. 12; Mon. xvi. f. 3, 4, 5.	<i>Solemya biarmica</i> , King, non Vern. Mon. tab. 16. f. 7.	Tunstall, Humbleton.			*						
31.	<i>Edmondia elongata</i> ...	Howse	Trans. T. N. F. C. vol. i. p. 243; Annals, v. 19. Pl. IV. f. 10-13.	<i>Edm. Murchisoniana</i> , King, Cat. p. 10; Mon. tab. 14. f. 14-17.	Tunstall, Humbleton ...			*						
32.	<i>Tellina Dunelmensis</i>	Howse	Trans. T. N. F. C. vol. i. p. 243; Annals, vol. 19. Pl. IV. f. 14, 15.	<i>Psemmobita</i> ? <i>subapapracea</i> , Cat. p. 12; Mon. tab. 16. f. 6.	Humbleton			*						
33.	GASTEROPODA. <i>Chiton Loftusianus</i> ...	King ...	London Geological Journal, vol. i. f. 1-4; Mon. tab. 16. f. 9-14.		Clack's Heugh, Tunstall, Humbleton, Silksworth, Ryhope, Southwick Red-House.			*						

34.	<i>Calyptrea antiqua</i> ...	Howse	(Trans. T. N. F. C. i. p. 242; Ann. vol. 19. ser. 2. Pl. IV. f. 16, 17.	<i>Patella Hollebevi</i> , Schauroth, Ein Beitrag, p. 557. pl. 21. f. 8.	Tunstall	...	...	...	*
35.	<i>Eulima symmetrica</i> ...	King	<i>Macrochelus symmetricus</i> , King, Mon. pl. 16. f. 32, 33.		Tunstall, Silksworth.	...	...	...	*
36.	<i>Chemnitzia Roessleri</i> ..	Geinitz	<i>Lor. id.</i> , Schauroth, Beitrag, &c. p. 558. pl. 21. f. 9.	<i>Chemnitzia</i> indet., Trans. T. N. F. C. vol. i. p. 241. <i>Lor. Swedenborgiana</i> , Mon. p. 210?	Tunstall Hill	...	...	...	*
37.	---- <i>Altenburgensis</i> ...	Geinitz	<i>Tychonilla Altenburgensis</i> , Gein. Verst. tab. 3. f. 9, 10; Ann. Nat. Hist. ser. 2. vol. 19. Pl. IV. f. 18.	<i>Locosema Geinitziana</i> , King, Mon. p. 210. pl. 16. f. 31. <i>Lor. fasciata</i> , King, Mon. p. 209. pl. 16. f. 30. <i>Turrit. Phillipsii</i> , Trans. T. N. F. C. vol. i. p. 240. <i>Turrit. Tunstallensis</i> , Trans. T. N. F. C. vol. i. p. 241.	Tunstall Hill, Humbleton, Dalton-le-dale.	...	...	...	*
38.	<i>Littorina helicina</i>	Schloth.	<i>Trochilites id.</i> , Petrefactenkunde, p. 161, 1820; Ann. Nat. Hist. ser. 2. vol. 19. Pl. IV. f. 19, 20.	<i>Turbo Mancunensis</i> , Brown, Manch. Trans. Geol. Soc. vol. i. pl. 6. f. 1, 2, 3. <i>Turbo Taylorianus</i> , Mon. pl. 16. f. 25, 26. <i>Littorina Tunstallensis</i> , Trans. T. N. F. C. vol. i. p. 240. <i>Turbo Thompsonianus</i> , King, Mon. 16. f. 23, 24. <i>Trochus pusillus</i> , Gein. Verst. pl. 3. f. 15, 16. <i>Turbo Permianus</i> , King, Cat. p. 13; Mon. pl. 16. f. 16.	Southwick-lane House, Humbleton, Tunstall, Clack's Heugh, Byer's Quarry near Whitburn, Roker, &c.	...	...	...	*
39.	---- <i>Hereynica</i>	Geinitz	<i>Nat. Hereynica</i> , Gein. Verst. pl. 3. f. 11-13.	<i>Natica Læonitiziana</i> , King, Cat. p. 13; Mon. pl. 16. f. 27, 28. <i>L. minima</i> , Trans. T. N. F. C. vol. i. p. 240.	Tunstall, Humbleton, Silksworth.	...	...	...	*
40.	<i>Pleurotonaria antrina</i>	Schloth.	<i>Troch. id.</i> , Beitr. z. Naturg. d. Verst. p. 32. t. 7. f. 6; Ann. Nat. Hist. ser. 2. vol. 19. Pl. IV. f. 21, 22, 23, 24, 25.	<i>P. Sedgwicki et L. penea</i> , Trans. T. N. F. C. vol. i. p. 238. <i>P. Tunstallensis</i> , Mon. pl. 17. f. 3, 4, 5. <i>P. Linkiana</i> , Mon. pl. 17. f. 7, 8. <i>Euomphalus Permianus</i> , Mon. pl. 17. f. 10, 11, 12. <i>P. Verneulii</i> , Gein. Verst. tab. 3. f. 17, 18.	Tunstall, Hylton Castle, Humbleton, Ryhope, Dalton-le-dale, &c.	...	...	...	*
41.	---- <i>nodulosa</i>	King	Mon. p. 216. pl. 17. f. 9.		Tunstall, Humbleton	...	...	...	*
42.	CEPHALOPODA. <i>Nautilus Frieslebeni</i> ...	Geinitz	Verstein. tab. 3. f. 7 a, b, c; Ann. Nat. Hist. ser. 2. vol. 19. Pl. IV. f. 26.	<i>N. Bowerbankianus</i> , King, Mon. p. 220. pl. 17. f. 17, 18, 19.	Clack's Heugh, Humbleton, Tunstall, Silksworth, Dalton-le-dale.	...	...	...	*
43.	PTEROPODA. <i>Theca Kirbyi</i>	n. s.	Ann. vol. 19. ser. 2. Pl. IV. f. 27.		Tunstall Hill	...	...	...	*

Remarks on the Species.

BRACHIOPODA.

1. *LINGULA CREDNERI*, Geinitz.—The form of this shell as it occurs in the marl-slate of Durham is a perfect oval, the breadth being about two-thirds of the length. On our specimens the roll-formed elevation is not so distinct as Geinitz represents it, but the height of the valve increases from the posterior umbonal margin to about one-third the length of the shell, whence it decreases gradually towards the front and more rapidly towards the sides. The lines of growth are strongly raised, and much wider apart in front than in any other part.

This shell is finely preserved in the marl-slate at Ferry Hill, where it is rather abundant. The largest specimen I have seen is half an inch in length and five-sixteenths in breadth, but it is generally very much less. Only one individual occurred with both valves together, and that was found in the compact limestone a few feet above the marl-slate. Along with these, numerous fragments of Fishes and specimens of *Caulerpites selaginoides* constantly occur.

I may be allowed to question the occurrence of this or any other species of *Lingula* in the underlying red sandstone, as stated in King's Monograph on the authority of Prof. Johnston, as this sandstone is a true coal-measure stratum.

2. *DISCINA KONINCKI*, Geinitz.—Very little can be added to the original description of this shell by Geinitz. The German specimens appear to be of about the same size as those occurring in England, and with the same proportions. This Brachiopod has a greater vertical range in England than any of the others, being found in the marl-slate, compact limestone, and shell-limestone; it is also the rarest.

Geinitz observes, that as "neither the drawing nor description of Schlotheim's *O. speluncaria* appears to exist, the name which Schlotheim gave to it should be suppressed." Mr. King has, however, upon Goldfuss's authority, again revived it; but until some figure of it, or some description or specimen can be shown, we have no right to adopt an apocryphal name.

3. *PRODUCTUS HORRIDUS*, Sow.—The exterior of this shell is now very generally well known through the numerous figures and descriptions of it which have from time to time been published by several authors, but the interior has up to the present period never been correctly delineated. Through the kindness of Mr. Davidson, I am, however, furnished with four proof-plates of Permian fossils, and favoured with permission to make references to them; in these the interior of this species is for the first time faithfully represented.

In the shell-limestone of Humbleton this species generally

occurs in casts, on which all the permanent structures of the interior of the shell are faithfully impressed. One can, by a study of these casts alone, restore and represent all the important characters of the interior; but in addition to these casts, one frequently finds at Tunstall the shell itself, showing the interior as perfectly preserved as in recent shells. It is therefore rather a matter of surprise that no better figures of the interior of this shell have yet been published. Mr. King figures a gutta-percha cast of the interior of one valve only, and that one, judging from the specimens that I have examined, very incorrectly, as will best be proved by comparing his figure, Mon. pl. 11. fig. 10, with Mr. Davidson's Mon., pl. 4. figs. 19, 21, and with good casts from Humbleton or interiors from Tunstall. The most incorrect part of Mr. King's restoration is the strongly granulated or obscurely dendritic appearance of the adductor muscular impressions, which are also erroneously divided into two sets; and the reniform impressions are made to take their origin in these more distinctly than is warranted by good specimens. The cardinal boss, the hinge-margin, and the spine-like callosities on the inner surface of the shell are also all very imperfectly represented. Dr. Geinitz's figures of the same valve are more correct than the one already mentioned, but the adductor muscular impressions are too leaf-like and lobed. All the other figures of this valve that have been published since 1850 appear to be merely copies from King's.

The hinge-line of the upper valve is not quite straight, but slightly angulated, the angle being strongest near the boss. The boss, or cardinal muscular fulcrum, varies slightly in form, but it is generally bifid at the extremity, each part being slit by a deep triangular groove or furrow. When *in situ* it fills nearly the whole of the umbonal cavity of the lower valve and presses against its inner surface. It may thus assist in keeping the valves in position. About the base of the boss the shell is very much thickened, and from it a strongish ridge runs along on each side parallel to the hinge-margin, which gives to the latter a bevelled appearance. On the outer side of this ridge is seen the row of depressions caused by the cardinal spines. From the base of the boss a thin plate or septum proceeds straight forwards into the cavity of the shell, becoming deeper and free in front; it separates the adductor muscular impressions and the reniform callosities, to which latter the oral arms were probably attached. The muscular impressions on this valve have each a triangular form, and as they are placed close to each side of the median plate, they have together a fan-shaped form. They are considerably raised, and most so on the anterior margin. Their surface is sculptured out into deep curved linear hollows for the attach-

ment of the muscles. The surface round about these muscles and the cardinal regions is neatly pitted, causing small pimples on the casts; these are probably the ovarian spaces. One observes similar markings on the corresponding parts of the other valve.

It is generally supposed that the reniform callosities are connected with the vascular system, but this supposition appears to be unsupported by a comparison of these processes with the corresponding parts of other Brachiopods. If we compare them, for example, with the same valve of *Argiope*, or of *Thecidium*, genera which show points of resemblance to this in several particulars, we find that these processes have served for the attachment of the oral arms; and this view is supported by all that we know of the position of these arms in both recent and fossil genera. At least, these structures cannot be attributed to the vascular system, or they would undoubtedly be present in both valves, whereas they are confined to one.

On some casts of this *Productus* a great number of small parallel grooves or furrows are seen running from the central ovarian region to the anterior margins of the valves; they are not very distinct, but they may perhaps hereafter be found to have been connected with the vascular system. This idea is somewhat strengthened by the appearance of similar lines on some casts of *Spirifer*, which few persons would hesitate to pronounce as vascular sinuses. There remain to be noticed on this small valve the curious spine-like callosities which stud the whole of the anterior portion of the shell; they are strongest where the produced, curved-up portion of the margin takes its rise, and seem to have been for the more secure attachment of the mantle and for giving it a greater surface.

In the lower valve an elevated callosity near the beak of the shell forms a fulcrum for the attachment of the adductor muscles; its surface is strongly rugose. On each side of it are placed the somewhat oblong, finely-striated impressions of the cardinal muscles. The small pittings on the ovarian regions, the spinose callosities, and grooved surface of the interior correspond with the same appearances in the upper valve.

It is found in England in the compact- and shell-limestone only, in numerous localities.

4. *PRODUCTUS LATIROSTRATUS*, Howse.—When I was engaged in drawing up my Catalogue of Permian Fossils, I found that this shell had not been described or mentioned by any one; and as I had collected several fine specimens at Dalton-le-dale, and had not seen or heard of any other specimens of it than these, I concluded that it was entirely new, and described it as such in the 'Tyneside Transactions' as follows:—

Shell gryphæoid, concavo-convex ; lower valve convex, bilobed, or with a slight furrow or sinus in the centre ; upper valve slightly concave, or nearly flat ; beak of lower or convex valve large, and very much flattened ; hinge-line of upper valve rather angulated, furnished with a large triangular button ; surface of convex valve covered with a few distant spines.

The above description was drawn up from a cast, Pl. IV. fig. 2, which Mr. Davidson has recently figured, Mon. Brit. Brach. pl. 4. fig. 5, and which Mr. King had the loan of, with all my other Permian *Producti*, for a considerable time. The discovery of a large series of specimens at Tunstall in a fine state of preservation enables me, through the liberality and kindness of Mr. Kirkby, to add a few more particulars to the above description.

The general form is subquadrate, somewhat compressed when seen laterally, but in full-grown specimens it has a considerably produced frontal margin. The lower valve only is covered sparingly with spines of great length ; some that I have seen extend more than two inches from the shell. The hinge-margin of this valve is very much thickened by lines of growth, so as to lead one to suppose that it is furnished with an area, but it is not. A small triangular aperture, open from the very apex, receives the sharply-pointed triangular boss of the upper valve. This sharp point leaves a little, narrow groove as the shell increases in growth. But there is no proper area, foramen, or deltidium to be seen,—nothing, in short, to warrant its removal from the genus *Productus*.

It differs from its congener in several important particulars. The boss or muscular fulcrum, the shape of the muscular impressions, the greater size of the oral arms, the absence of cardinal spines on the upper valve, the flanging of the hinge-margin of the upper valve, are so strongly characterized, that it cannot be mistaken for any other species.

Mr. King has given to this shell another name, for the priority of which he refers to his catalogue. As I shall state my claims of priority elsewhere for my catalogue, it may be permitted me to remark here, that this shell is not specifically described in Mr. King's catalogue. It occurs in the shell-limestone only, in which I have taken a fine series at Dalton, and Mr. Kirkby at Tunstall Hill.

5. *STROPHALOSIA GOLDFUSSI*, Münst.—To this characteristic but variable species I now refer all the *Strophalosia*, which have been separated into two groups by all who have written on Permian shells. I was of this opinion before I became acquainted with Geinitz's 'Versteinerungen ;' but from the characters given in that work and Mr. King's Monograph, and an excellent series of these forms collected by Mr. Kirkby and myself, I am in-

duced to abandon this idea and to include both forms in one specific group.

The *Orthothrix Goldfussi* of Geinitz is the typical form. It is the *Strophalosia excavata*, King; and *Stroph. Goldfussi*, King, is without a doubt the *O. excavatus*, Geinitz, as any one may ascertain by consulting the figures and descriptions given by both these authors in the 'Versteinerungen' and 'Monograph.'

Stroph. Goldfussi, Münt., is thus characterized by Geinitz:—"Back (ventral) shell roundish oval, quite like the preceding species (*O. lamellosus*, Gein.), and also without a sinus, and covered all over the surface with close-set tubular spines and with a short but high area." The shells figured by Mr. King, Mon. tab. 12. figs. 13, 14, 15, 16, so evidently belong to the above description, that I need not quote Geinitz further to prove it. This is the form which I formerly described as *Productus asperrimus*.

Geinitz's *O. excavatus* is described as hemispherical transverse-oval, with a small, depressed, pointed umbo, a high area, and a narrow, sometimes only weakly-marked sinus, with fine concentric striæ, and studded with thin but long tubular spines. The general character, "halbkugelig quer-oval," is so expressive of the general appearance of King's *S. Goldfussi*, Mon. pl. 12. figs. 1-11, that I cannot doubt its identity with *O. excavatus*.

The regular form of this shell, 'Mon. Brit. Perm. Brach.' pl. 3. figs. 19, 20, 21, 22, therefore must be considered as the typical *S. Goldfussi*; and if it is thought desirable to distinguish the other by a varietal name, *excavata* can be applied to it. But these two forms run so much into one another, that it is impossible to draw a line of separation between them.

The principal character by which Geinitz would separate his *O. excavatus* from *O. Goldfussi* is the sinus of the ventral valve. This is not a constant character, and certainly not a specific one. Mr. King observes (Mon. p. 99),—"The arrangement of the spines constitutes a capital distinctive character for this species;" and, strangely enough, he refers to a shell doubtfully placed in *Goldfussi* by Geinitz and excluded from it by King as a proof. Now this excluded shell with the "capital distinctive characters" is nothing more than Mr. King's *S. Goldfussi*, for it is the *O. excavatus*, Gein. After all the difficulties attending the study of this species, one turns with pleasure, and for confirmation, to Mr. Davidson's excellent plate iii., and to the original *diagnosis* of this shell by N. Winch in the 'Geol. Trans.' vol. iv. p. 10, "A species of *Donax* with hair-like spines."

This species is common in the shell-limestone of Durham, and occurs also, but more sparingly, in the compact limestone, and has also a very extensive lateral range.

6. STROPHALOSIA CANCRINI, de Verneuil.—In England this shell is best known as King's *S. Morrisiana*, in Germany it is Geinitz's *Orthothrix lamellosus*, and in Russia it is the *Prod. Cancrini*, de Vern. It may rejoice in more epithets than these, but I am unacquainted with them. The one I have adopted is that under which it was first described. Geinitz's name is next in order, as his description and figures were published in the early part of April 1848; and Mr. King's is last, as his specific description cannot date earlier than the appearance of his Catalogue in August 1848.

This species varies so much with age and locality, and is so apt to become distorted, that no special form can be given that will include all the individuals which undoubtedly belong to it. In general, young individuals are broader than long—that is, when the shell is of regular growth,—and the greatest breadth of the shell is then very little more than that of the hinge-margin. In larger individuals the general form is almost circular, and the hinge-margin appears narrower. In distorted specimens the area is much narrower and deeper than in those of regular growth. This is very remarkable in some specimens from Tunstall. At Dalton this species resembles the form to which Geinitz has applied the name *lamellosus*. The specimens from Humbleton are much larger, and generally of regular growth. I have never been able to detect spines on the upper valve of any of the specimens from the above localities, but Mr. Kirkby has lately obtained some individuals from Ryhope with the spines distinctly shown on this valve. These specimens are also rather broader than those from other localities, and the striae are nearly obsolete. The most striking characters common to all these forms are the long adpressed spines of the lower valve, and the strong radiating striae which are generally present on both valves. In old individuals the front margin strikes off nearly horizontally, and forms a kind of siphonal tube in front. There is also a tendency in this species to form a new internal surface behind the old upper valve, for the purpose of contracting the interior of the shell. It is not an additional, third valve as King has supposed, for it is essentially connected with the upper valve; and must have been formed by the upper lobe of the mantle.

Most plentiful in the shell-limestone of Humbleton, Tunstall, and Dalton. In the compact limestone it is very rare.

7. ORTHISINA PELARGONATA, Schloth.—This neat species is not included in the list of Permian fossils of the 'Geol. Russ.' as a British species; and indeed, when I became acquainted with some of our palæontologists, I found them entirely unacquainted with it. This was remarkably the case with Mr. King, who had

not the slightest knowledge of the shell when I first showed it to him, and to whom I presented a fine series of Dalton specimens afterwards, that he might be able to illustrate the species in his 'Monograph.'

The general form of this species is now, through the figures of Geinitz and King, pretty well known, and the interiors have lately been very accurately represented by Mr. Davidson in his work on the Permian Brachiopoda, pl. 2. figs. 38-40.

Though a rare species generally, numerous examples are occasionally found in a very limited space. It is the common associate of *P. latirostratus*, both at Dalton-le-dale and Tunstall, where numerous examples have been taken by Mr. Kirkby and myself.

8. *CAMAROPHORIA SCHLOTHEIMI*, v. Buch.—It is very probable that some specimens figured by Verneuil in the 'Geol. Russ.' under a distinct name, *Terebratula superstes*, belong to the present species; but as I have not seen specimens of that species, I cannot settle this point. Mr. King thinks that some specimens figured by Geinitz under this name, 'Verst.' pl. 4. figs. 48, 49, belong to another species, but the figures referred to are only more plaited than usual. Similar specimens occur occasionally at Dalton, which Mr. King is inclined to refer also to our *C. Humbletonensis*; but I can say with confidence that this last species never occurs in that locality.

This most characteristic Brachiopod occurs rather plentifully in the shell-limestone of this district, and very sparingly in the compact limestone.

9. *CAMAROPHORIA GLOBULINA*, Phill.—This is a very distinct species, though some authors only partially acquainted with it have united it with the preceding.

Its spherical form, biplicated sinus, and the comparative smallness of the size it attains to, would be sufficient alone to separate it from all other Permian species; but in addition to these external characters, the apophysary system is also slightly modified, and it retains its specific appearance in all the numerous localities in which it occurs.

Baron Schauroth has lately figured a German example of it, which he refers to the preceding species. In the 'Versteinerungen,' pl. 4. figs. 51, 52, Geinitz refers some examples to the *Terebratula superstes*, de Vern., which belong apparently to this species.

It occurs in the compact- and shell-limestone, sometimes very plentifully.

10. *CAMAROPHORIA HUMBLETONENSIS*, Howse. Pl. IV. figs. 3, 4.

"Shell subtriangular or obovate; perforated valve with a broad

sinus in the middle, rounded towards the lateral margins; imperforated valve high in the middle, depressed towards the sides; the front margin of the sinus and sides produced horizontally a short distance from the cavity of the shell; surface with numerous plaits in the sinus, which are sometimes bifurcated, and a few on the sides granulated."

This species was first described under the above name in the 'Trans. Tyneside Nat. Field Club,' where also some other peculiarities are pointed out by which it may be known and distinguished from the preceding species. The testimony of von Buch in favour of this opinion is singular, for at the same time that he separates *Terebratula Schlotheimi* from the *T. lacunosa*, he expressly says that the latter is found in the magnesian limestone at Humbleton.

It occurs in the shell-limestone at Humbleton, sometimes in considerable abundance. I have never found it at Dalton, nor do I think that it occurs there. I have however taken one specimen from the magnesian conglomerate of Tynemouth. It is a very local species, and has not yet been found, I think, in any foreign locality.

11. *SPIRIGERA PECTINIFERA*, Sow.—The internal structure of this very interesting shell is not correctly represented in King's Monograph, so far as I am able to judge from specimens collected at Humbleton. In the enlarged figure, tab. 10. fig. 9, the platform, or expansion between the crura of the loop, is much too large, and in fig. 10 the coil is represented with small blunt pectinations round its outer margin. This serrated appearance is due to mineralization, for upon close examination the entire coil of some examples is found to be covered all over with fine crystals. In the greater number of specimens of the interior that I have seen, the coil appeared quite smooth. For the perfect understanding of this species it will be necessary to consult Mr. Davidson's excellent plates, Mon. Brit. Perm. Brach. pl. 1. figs. 50-56, pl. 2. figs. 1-5, in which all the peculiarities of this singular shell are carefully represented. I have not however, up to the present time, been able to detect the presence of spinous processes on the margin of the coil.

In England this species is almost as limited in its distribution as the last, occurring only in the shell-limestone at Humbleton, Tunstall and Hylton, and in the magnesian conglomerate at Tynemouth.

12. *MARTINIA CLANNYANA*, King.—This species does not appear to be covered with spines, as some have supposed, but the outer surface of the valves is studded all over with minute granulations.

It occurs rather plentifully at Ryhope-Field-House, and Mr. Kirkby has recently taken it at Tunstall in shell-limestone. There are some specimens in the Sunderland Museum much larger than any others I have seen; they are from the compact limestone of Pallion.

13. *SPIRIFERINA CRISTATA*, Schloth.—It is more sharply triangular than any other Permian species occurring in this district. It is also well characterized by the sharpness and depth of its numerous plaits and the great size of the perforations of the shell.

It is rather sparingly distributed, occurring mostly at Humbleton and Tunstall in shell-limestone.

14. *SPIRIFERINA MULTIPLICATA*, Sow.—It is very much rounded in its general outline, and the plaits are less numerous and more rounded than in the foregoing species. The shell-punctures are very much smaller, so as not to be visible to the naked eye or impressed on casts. The *T. Jonesiana*, King, is only a more rounded form of this shell occurring commonly at Dalton.

It occurs rather plentifully in the shell-limestone of several localities.

15. *SPIRIFER UNDULATUS*, Sow.—I regret that I cannot assent to the division of this fine characteristic shell into three species, as proposed by Mr. King in the 'Permian Monograph.' The specimens figured in this work, pl. 10, are all referable to the above, and in the text no character has been pointed out of specific or even varietal value.

It is not very abundant in any locality, but may be met with most frequently at Humbleton in the shell-limestone. It occurs also in the compact limestone and in the magnesian conglomerate at Tynemouth.

16. *TEREBRATULA ELONGATA*, Schloth.—I agree fully with Dr. Geinitz, who has referred all the forms, including *T. sufflata*, occurring in the magnesian limestone, back to this species; and I deeply regret that the author of the 'Permian Monograph' has again attempted to raise the *T. sufflata* to the rank of a species, for surely nothing can be so injurious to the true progress of science as the burdening of it with useless synonyms.

This species is very abundant in several localities in the shell-limestone, of which it is very characteristic. It occurs at Tynemouth, in the magnesian conglomerate.

[To be continued.]